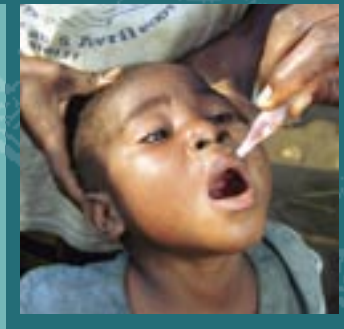
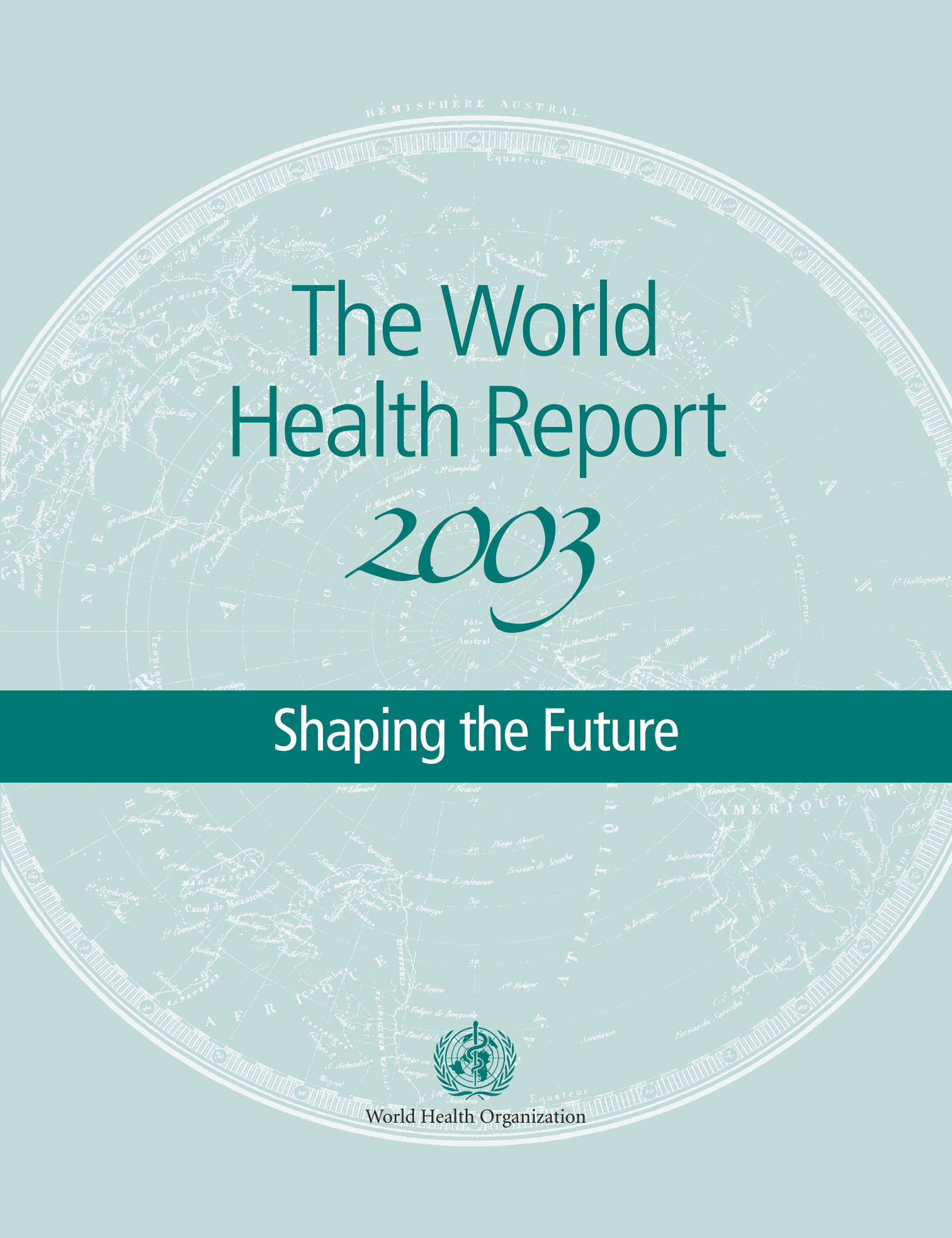
WORLD HEALTH ORGANIZATION

The World Health Report 2003



Shaping the Future





The World Health Report 2003

Shaping the Future

World Health Organization

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This report was produced under the overall direction of Tim Evans (Assistant Director-General) and Robert Beaglehole (Editor-in-Chief). The principal authors were Robert Beaglehole, Alec Irwin and Thomson Prentice.

The other main contributors to chapters were: *Chapter One*: Colin Mathers, Kenji Shibuya and Claudia Stein. *Chapter Two*: Andrew Cassels and Michel Thieren. *Chapter Three*: Paul Farmer. *Chapter Four*: Bruce Aylward. *Chapter Five*: David Heymann and Mary Kay Kindhauser. *Chapter Six*: Ruth Bonita and Srinath Reddy (cardiovascular diseases section); Sarah Galbraith and Douglas Bettcher (tobacco control section); Margaret MacIntyre, Margaret Peden, Mark Rozenberg and Christie Vu (road traffic hazards section). *Chapter Seven*: Rafael Bengoa, Ties Boerma, Marie-Andrée Diouf, David Evans, William Savedoff, Alaka Singh, Barbara Stilwell, Wim Van Lerberghe and Eugenio Villar Montesinos.

Other contributors to the report were: Prerna Banati, Michel Beusenberg, Sandro Colombo, Carlos Dora, Joan Dzenowagis, Helga Fogstad, Elangovan Gajraj, Gauden Galea, Claudio Garcia Moreno, Yusuf Hemed, Alan Hinman, Alex Kalache, Rania Kawar, Michele Levin, Alan Lopez, Abdelhay Mechbal, Lembit Rago, Shekhar Saxena, Philip Setel, Cyrus Shahpar, Hans Troedsson and Alice Yang.

Contributors to statistical tables were: Dorjsure Bayarsaikha, Steve Begg, Christina Bernard, Dan Chisholm, Steve Ebener, Emmanuela Gakidou, Yaniss Guigoz, Patricia Hernández, Mollie Hogan, Kim Iburg, Chandika Indikadahena, Mie Inoue, Karsten Lunze, Doris Ma Fat, Takondwa Mwase, Fanny Naville, Jean-Pierre Poullier, Chalapati Rao, Darryl Rhoades, Hossein Salehi, Joshua Salomon, Angelica Sousa, Ruben M. Suarez-Berenguela, U Than Sein, Niels Tomijima, Nathalie Van de Maele, Sven Volkmuth, and Hongyi Xu.

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LEE Jong-wook

Today's global health situation raises urgent questions about justice. In some parts of the world there is a continued expectation of longer and more comfortable life, while in many others there is despair over the failure to control disease although the means to do so exist.

This contrast is starkly evident in lack of access to HIV/AIDS treatment, which led me, earlier this year, to declare a global health emergency. WHO decided to take this rare measure after evaluating the global situation and finding that only 5% of those in the developing world who require antiretrovirals (ARVs) are getting them. In sub-Saharan Africa, only 50 000 of the 4 million people in need have access to ARVs. This spells catastrophe, not only for the societies hardest hit but for the world as a whole. Our first step to respond to this crisis must be to reach "3 by 5" – 3 million people in developing countries on antiretrovirals by 2005. Major disparities also exist in areas such as child mortality. Of the more than 10 million children under 5 years old who die every year, almost all are in developing countries.

A world marked by such inequities is in very serious trouble. We have to find ways to unite our strengths as a global community to shape a healthier future. This report on the world's health, my first since taking office, gives some initial indications of how to do it.

A message that runs throughout these pages is that progress in health, including rapid and sustainable expansion of emergency treatments, depends on viable national and local health systems. Scaling up ARV therapy in resource-poor settings has to be done in such a way as to strengthen health systems based on primary health care. In most countries, there will be only small and short-lived advances towards acceptable standards of health without the development of health care systems which are strong enough to respond to current challenges.

To lend impetus to this process WHO is now making results in countries its main objective. Effective action to improve population health is possible in every country but it takes local knowledge and strength to turn that possibility into reality. We have learnt this through successes such as controlling the SARS epidemic and major advances in the polio eradication campaign, and we have learnt it through setbacks as well, such as the continuing rise of AIDS, TB and malaria. All of these lessons have prepared us for the task ahead.

Twenty-five years ago, the Declaration of Alma-Ata challenged the world to embrace the principles of primary health care as the way to overcome gross health inequalities between and within countries. "Health for all" became the slogan for a movement. It was not just an ideal but an organizing principle: everybody needs and is entitled to the highest possible standard of health. The principles defined at that time remain indispensable for a coherent vision of global health. Turning that vision into reality calls for clarity both on the possibilities and on the obstacles that have slowed and in some cases reversed progress towards meeting the health needs of all people. This entails working with countries – especially those most in need – not only to confront health crises, but to construct sustainable and equitable health systems.

I urge the global health community to set its sights on bold objectives. All countries of the world have pledged to reach the Millennium Development Goals set at the United Nations Summit in 2000. These include ambitious targets for nutrition, maternal and child health, infectious disease control, and access to essential medicines. With this support we have a real opportunity now to make progress that will mean longer, healthier lives for millions of people, turn despair into realistic hope, and lay the foundations for improved health for generations to come.

To reach our goals, increased resource commitments and intensified collaboration among partners will be required. The following report describes the challenges we face and points the way for a united response from WHO and the global health community.

LEE Jong-wook
Geneva
October 2003

Overview

Global health is a study in contrasts. While a baby girl born in Japan today can expect to live for about 85 years, a girl born at the same moment in Sierra Leone has a life expectancy of 36 years. The Japanese child will receive vaccinations, adequate nutrition and good schooling. If she becomes a mother she will benefit from high-quality maternity care. Growing older, she may eventually develop chronic diseases, but excellent treatment and rehabilitation services will be available; she can expect to receive, on average, medications worth about US$ 550 per year and much more if needed.

Meanwhile, the girl in Sierra Leone has little chance of receiving immunizations and a high probability of being underweight throughout childhood. She will probably marry in adolescence and go on to give birth to six or more children without the assistance of a trained birth attendant. One or more of her babies will die in infancy, and she herself will be at high risk of death in childbirth. If she falls ill, she can expect, on average, medicines worth about US$ 3 per year. If she survives middle age she, too, will develop chronic diseases but, without access to adequate treatment, she will die prematurely.

These contrasting stories reveal much about what medicine and public health can achieve, and about unmet needs in a world of vast and growing health inequalities. *The World Health Report 2003* affirms that the key task of the global health community is to close the gap between such contrasting lives. Building on past experience and achievements, the report proposes solid strategies to shape a healthier, more equitable future.

A key message of this report is that real progress in health depends vitally on stronger health systems based on primary health care. In most countries, there will be only limited advances towards the United Nations Millennium Development Goals and other national health priorities without the development of health care systems that respond to the complexity of current health challenges. Systems should integrate health promotion and disease prevention on the one hand and treatment for acute illness and chronic care on the other. This should be done across all levels of the health care system, with the aim of delivering quality services equitably and efficiently to the whole population. The lessons from SARS and poliomyelitis eradication programmes shape strategies for an urgent health system response to HIV/AIDS; in turn, scaling up the attack on HIV/AIDS will do much to strengthen health care systems.

Stronger health systems: the minimum requirements

How can the young girl in Sierra Leone be given the same chances for a healthy life as the girl born in Japan? Many factors – such as poverty, armed conflict, institutional stability and the state of basic infrastructure – lie beyond the direct control of the health system. Understanding the importance of these factors, the World Health Organization (WHO) advocates aggressively for improvements in the underlying determinants of health. But there is much a well-functioning health care system can do to narrow health outcome gaps, even as the work of reducing poverty and socioeconomic injustice continues.

For every child born today to have a good chance of a long and healthy life, there are minimum requirements which every health care system should meet equitably. These are: access to quality services for acute and chronic health needs; effective health promotion and disease prevention services; and appropriate responses to new threats as they emerge. New threats will include emerging infectious diseases, but also long-term shifts such as the growing burden of noncommunicable diseases and injuries and the health effects of global environmental changes. These challenges must be met simultaneously, inclusively and sustainably at the same time as underlying determinants of health are improved.

This report argues that the key to success is health systems strengthening, centred on the strategies and principles of primary health care, constructing responses that support integrated, long-term health systems development on behalf of the entire population. This requires both effective use of existing knowledge and technologies and innovation to create new health tools, along with appropriate structures and strategies to apply them. Success will demand new forms of cooperation between international health agencies, national health leaders, health workers and communities, and other relevant sectors.

The World Health Report 2003 consists of seven chapters. Key ideas and thematic connections among the chapters are briefly described here. Detailed content is summarized at greater length in a subsequent section of this overview.

The report opens with an update in *Chapter One* of the current state of world health. It examines both life expectancy and healthy life expectancy, and shows the global and regional gaps between the two, highlighting differences between the poor and the better-off everywhere. Among leading communicable and noncommunicable causes of death and disability, HIV/AIDS emerges as the most urgent priority. This is first reflected in *Chapter Two*, on the slow progress so far towards the health-related Millennium Development Goals, including action on HIV/AIDS; *Chapter Three* is entirely devoted to the pandemic itself and shows why a bold HIV/AIDS control effort must drive the agenda for the global health community.

Communicable diseases are one part of the double burden of ill-health. They include both old and new infectious threats. One of the great public health goals of the 20th century was the eradication of polio: *Chapter Four* looks at the final steps needed to achieve polio eradication within the next few years. Meanwhile, new diseases have been emerging at the rate of one per year for the last 20 years or more. The latest, which caused global alarm in 2003, is SARS, and the lessons learnt from the outbreaks are contained in *Chapter Five*.

Confronting the double burden is the theme of *Chapter Six*. A deadly overlap between communicable and noncommunicable diseases and injuries is occurring throughout the developing world, leading to a crisis of priorities for health systems already struggling with inadequate resources. This chapter is divided into three sections: the rapidly growing

epidemic of cardiovascular disease; the global tobacco epidemic; and the multiple hazards – direct and indirect – from the growth in road traffic.

All of the topics introduced above demand stronger health systems. *Chapter Seven* tackles this issue in depth. It advocates strengthening health systems based on the principles and practices of primary health care and examines key dimensions of scaling up, from the health workforce crisis to pro-equity stewardship of the health system.

Core values for a global health partnership

Achieving national and global health objectives requires new resources and unprecedented levels of cooperation among multilateral agencies, national authorities, communities, the private sector and other stakeholders. Such a mobilization must be based on rigorous science, but also on a clear ethical vision.

An ethical vision in global health draws inspiration from the Constitution of the World Health Organization, drafted in 1946. Then, as today, the world was deeply concerned with questions of security. Indeed, "to maintain international peace and security" was the primary purpose assigned to the United Nations. But the founders of WHO and the United Nations system saw clearly the relationship between security and justice. Neither of these two values can endure without the other. People who had lived through the Second World War, witnessing the effects of nationalism, ethnic hatred, and the disregard of human dignity pushed to their extremes, understood this interdependence. The preamble to its Charter makes clear that the mission of the United Nations to protect security depends on the establishment of "conditions under which justice … can be maintained".

The founders of the international system more than half a century ago grasped the close connection between health – understood as "a state of complete physical, mental and social well-being" – and the core values of justice and security. The WHO Constitution identifies the "enjoyment of the highest attainable standard of health" as "one of the fundamental rights of every human being without distinction". A crucial part of justice in human relations is promoting equitable access to health-enabling conditions.

During the last decades of the 20th century, health and security were often separated from each other in national and international debates. Increasingly, however, the connections between these two domains are re-emerging. The United Nations Security Council and national bodies acknowledge, for example, the growing security impact of HIV/AIDS. The threat of new infections demands new forms of cooperation between security and public health.

As globalization accelerates, the interdependence of nations is perceived clearly. Treating others justly is now both a moral imperative and an aspect of wise security policy. This *World Health Report* shows how SARS has brought interdependence and the need for international cooperation strongly to the fore. But the basic principle extends to many other areas of public health concern.

Population health contributes crucially to economic and social development. This is reflected, for example, by the importance accorded to health issues in the United Nations Millennium Development Goals. These goals are central to WHO's agenda and to this report. Health is both a goal in itself and a key development input towards other goals.

This report is not comprehensive. It focuses on selected themes, mentioning many other important subjects only tangentially. Mental health, tuberculosis, malaria, malnutrition and reproductive health will clearly remain crucial focus areas for WHO, although they receive

limited attention here. Similarly, the human impact on the natural environment and the health consequences of environmental change for human populations are given little direct attention. However, these processes will significantly shape health patterns, and the demands on health care systems, in the years ahead.

The purpose of this *World Health Report* is to encourage action for health improvement, especially for the poor and disadvantaged. This is no longer the time for academic debate: the moral imperative is for urgent action. Cooperation between governments, international institutions, the private sector and civil society spurred remarkable public health progress in the 20th century. In an increasingly interdependent world, such collaboration across political and sectoral boundaries is more vital than ever. This report urges every reader, whether inside or outside public health institutions, to share in the task of shaping a healthy, equitable and sustainable future for all.

Chapter summaries

Chapter One contains an assessment of the global health situation, with some important and unexpected findings. Over the last 50 years, average life expectancy at birth has increased globally by almost 20 years, from 46.5 years in 1950–1955 to 65.2 years in 2002. The large life expectancy gap between developed and developing countries in the 1950s has changed to a gap between the very poorest developing countries and all other countries.

Of the 57 million deaths in 2002, 10.5 million were among children of less than five years of age, and more than 98% of these were in developing countries. Globally, considerable progress has been made since 1970 when over 17 million child deaths occurred. In 14 African countries, however, current levels of child mortality are higher than they were in 1990. Overall, 35% of Africa's children are at higher risk of death today than they were 10 years ago. The leading causes of death in children are perinatal conditions, lower respiratory tract infections, diarrhoeal diseases and malaria, with malnutrition contributing to them all. In sub-Saharan Africa, HIV/AIDS was responsible for an estimated 332 000 child deaths in 2002. Across the world, children are at higher risk of dying if they are poor and malnourished, and the gaps in mortality between the haves and the have-nots are widening.

The state of adult health at the beginning of the 21st century is characterized by two major trends: slowing of gains and widening health gaps; and the increasing complexity of the burden of disease. The most disturbing sign of deteriorating adult health is that advances in adult survival in Africa have been reversed so drastically that, in parts of sub-Saharan Africa, current adult mortality rates today exceed those of 30 years ago. The greatest impact has been in Botswana, Lesotho, Swaziland and Zimbabwe, where HIV/AIDS has reduced life expectancies of men and women by more than 20 years.

The fragile state of adult health in the face of social, economic and political instability is apparent elsewhere. Male mortality in some countries in eastern Europe has increased substantially. Globally, most countries are already facing the double burden of communicable and noncommunicable diseases. Almost half of the disease burden in high-mortality regions of the world is now attributable to noncommunicable diseases. Population ageing and changes in the distributions of risk factors have accelerated these epidemics in most developing countries. Injuries, both intentional and unintentional, are on the increase, primarily among young adults.

Chapter Two traces the origins of the Millennium Development Goals and charts the progress so far towards achieving them. These goals represent commitments by governments worldwide to do more to reduce poverty and hunger and to tackle ill-health, gender inequality, lack of education, access to clean water and environmental degradation. Three of the eight goals are directly health-related; all of the others have important indirect effects on health.

The Millennium Development Goals place health at the heart of development. This chapter warns that without significantly strengthened commitments from both wealthy and developing countries, the goals will not be met globally, and outcomes in some of the poorest countries will remain far below the achievements hoped for.

Chapter Three reviews major trends in the HIV epidemic and examines successes and failures in the struggle against the world's most devastating infectious disease, before discussing goals for the coming years. These include narrowing the AIDS outcome gap by providing three million people in developing countries with combination antiretroviral (ARV) therapy by the end of 2005 (known as the "3 by 5" target). Although robust HIV prevention and care constitute a complex health intervention, such interventions are not only feasible in resource-poor settings, but are precisely what is needed.

The chapter shows the often stark division between AIDS prevention and care, which in the developing world has meant that, for most people living with HIV, there is simply no decent medical care available at all. But it also provides examples, such as Brazil, where prevention and care have been successfully integrated. The chapter acknowledges that there is still a great deal to be done if the target of three million people on ARV therapy by 2005 is to be met. For this reason, WHO has formally declared inadequate access to ARV therapy to be a global health emergency, and has set in place a number of initiatives to respond accordingly and to progress towards the ultimate goal of universal access to ARV therapy.

Chapter Four is the encouraging story of how a major, ancient disease can be conquered. As a result of the Global Polio Eradication Initiative, one of the largest public health efforts in history, the number of children paralysed by this devastating disease every year has fallen from over 350 000 in 1988 to about 1900 in 2003; the number of countries in which the disease is endemic has fallen from over 125 to seven. This chapter records the expected last days of polio, one of the oldest known diseases, as the campaign to eradicate it nears its end. The vision of a polio-free world is within reach, although formidable obstacles remain.

The successes to date are the result of a unique partnership forged between governments, international agencies, humanitarian organizations and the private sector. Through this partnership, over 10 million volunteers immunized 575 million children against polio in nearly 100 of the lowest-income countries in the world in the year 2001 alone. The most visible element of the polio eradication initiative has been the National Immunization Days, which require immunizing every child under five years of age (nearly 20% of a country's population) over a period of 1–3 days, several times a year for a number of years in a row. In many countries, the scale and logistic complexity of these activities were even greater than those of campaigns undertaken during the height of the smallpox eradication effort.

To capitalize on progress so far, substantial effort is now required to interrupt the final chains of polio transmission, certify that achievement, and minimize the risk of polio being reintroduced in the future. The ultimate success of the eradication effort, however, is still not guaranteed; it now rests with a very small number of endemic areas, where all of the children must be immunized, and with donors who must close the chronic financing gap for these activities.

Chapter Five, on SARS, is a tale of how a completely new disease can emerge with major international implications for health, economy and trade. Its rapid containment is one of the success stories of public health in recent years and represents a major victory for public health collaboration.

SARS is a newly identified human infection caused by a coronavirus unlike any other known human or animal virus in its family. Transmission occurs mainly from person to person during face-to-face exposure to infected respiratory droplets expelled during coughing or sneezing. The overall case–fatality ratio, with the fate of most cases now known, approaches 11% but is much higher in the elderly. The international outbreak eventually caused more than 8000 cases and 900 deaths in 30 countries.

Seven key lessons emerge from the SARS epidemic and will help shape the future of infectious disease control. First and most compelling is the need to report, promptly and openly, cases of any disease with the potential for international spread. Second, timely global alerts can prevent imported cases from igniting big outbreaks in new areas, provided the public health infrastructure is in place and an appropriately rapid response occurs. Third, travel recommendations, including screening measures at airports, help to contain the international spread of a rapidly emerging infection.

Fourth, the world's scientists, clinicians and public health experts, aided by electronic communications, can collaborate to generate rapidly the scientific basis for control measures. Fifth, weaknesses in health systems, especially in infection control practices, play a key role in permitting emerging infections to spread. Sixth, an outbreak can be contained even without a curative drug or a vaccine if existing interventions are tailored to the circumstances and backed by political commitment. Finally, risk communication about new and emerging infections is a great challenge, and it is vital to ensure that the most accurate information is successfully and unambiguously communicated to the public.

Chapter Six, in contrast, describes the impact on developing countries of the stealthy but rapidly evolving epidemics of noncommunicable diseases and injuries, particularly cardiovascular disease (CVD), the global tobacco epidemic, and the "hidden epidemics" – direct and indirect – resulting from the growth in road traffic.

Today, the burden of deaths and disability in developing countries caused by noncommunicable diseases outweighs that imposed by long-standing communicable diseases. In examining the impact of the combination of these two categories, this chapter proposes a "double response" involving the integration of prevention and control of communicable and noncommunicable diseases within a comprehensive health care system based on primary health care.

Ironically, rates of CVD are now in decline in the industrialized countries first associated with them, although not all population groups have benefited. But from that irony stems hope: the decline is largely a result of the successes of primary prevention and, to a lesser extent, treatment. What has worked in the richer nations can be just as effective in their poorer counterparts, although particular attention is needed to ensure that the benefits flow to the entire population. There is now abundant evidence to initiate effective actions at national and global levels to promote and protect cardiovascular health through population-based measures that focus on the main risk factors shared by all noncommunicable diseases. The application of existing knowledge has the potential to make a major, rapid and cost-effective contribution to the prevention and control of the epidemics of noncommunicable diseases.

The consumption of cigarettes and other tobacco products and exposure to tobacco smoke are the world's leading preventable cause of death, responsible for about 5 million deaths in 2003, mostly in poor countries and poor populations. The toll will double in 20 years unless known and effective interventions are urgently and widely adopted. The recognition that globalization of the tobacco epidemic can undermine even the best national control programme led to the adoption by 192 Member States at the World Health Assembly in May 2003 of the WHO Framework Convention on Tobacco Control (WHO FCTC).

The opening of the Convention for signature and ratification provides an unprecedented opportunity for countries to strengthen national tobacco control capacity. Success in controlling the tobacco epidemic requires continuing political engagement and additional resources at both global and national levels. The resulting improvement in health, especially of poor populations, will be a major public health achievement.

Chapter Six concludes with an assessment of the rising toll of road deaths and injuries and emphasizes the indirect, but equally important, effects of the growth in road traffic. More than 20 million people are severely injured or killed on the world's roads each year. The social and economic burden falls most heavily on developing countries and will grow significantly heavier still in these countries because of the rapid increase in the number of vehicles on their roads. Existing knowledge must be converted into successful interventions for developing countries, taking account of each country's unique road safety circumstances. More generally, cross-sectoral collaboration can improve public health and make more efficient use of the resources of the health, environment and transport sectors.

Chapter Seven emphasizes that health systems must be strengthened to meet the formidable challenges described in earlier chapters. Without significant health systems strengthening, many countries will make little headway towards the Millennium Development Goals, the "3 by 5" target, and other health objectives. The chapter proposes an approach to scaling up health systems based on the core principles of primary health care formulated in the 1978 Declaration of Alma-Ata: universal access and coverage on the basis of need; health equity as part of development oriented to social justice; community participation in defining and implementing health agendas; and intersectoral approaches to health. While these principles remain valid, they must be reinterpreted in the light of dramatic changes in the health field during the past 25 years. The chapter clarifies the conceptual basis of the development of health systems that are led by primary health care, then explores how health systems based on primary health care principles can confront four major contemporary challenges: the global health workforce crisis; inadequate health information; lack of financial resources; and the stewardship challenge of implementing pro-equity health policies in a pluralistic environment.

The World Health Report 2003 closes by showing that reinforced cooperation with countries to scale up health systems is part of WHO's new way of working. Strengthening the Organization's presence and technical collaboration in countries is the best way for WHO to speed progress towards the global health community's most important goals: measurable health improvements for all, and aggressive strides to close equity gaps. Health inequalities scar the present and threaten the future. New forms of collaboration for comprehensive health systems development are needed to shape a world in which all people can enjoy the conditions of a healthy, dignified life. This report shows how WHO and its partners are drawing the lessons from recent achievements to press forward with this work.

Chapter One

Global Health:
today's challenges

Reviewing the latest global health trends, this chapter finds disturbing evidence of widening gaps in health worldwide. In 2002, while life expectancy at birth reached 78 years for women in developed countries, it fell back to less than 46 years for men in sub-Saharan Africa, largely because of the HIV/AIDS epidemic. For millions of children today, particularly in Africa, the biggest health challenge is to survive until their fifth birthday, and their chances of doing so are less than they were a decade ago. This is a result of the continuing impact of communicable diseases. However, a global increase in noncommunicable diseases is simultaneously occurring, adding to the daunting challenges already facing many developing countries.

1 Global Health: today's challenges

Although this report is global in scope, the findings irresistibly draw the main focus to the increasingly fragile health of sub-Saharan Africa. It is here, where scores of millions of people scrape a living from the dust of poverty, that the price of being poor can be most starkly seen. Almost an entire continent is being left behind.

Overall, 35% of Africa's children are at higher risk of death than they were 10 years ago. Every hour, more than 500 African mothers lose a small child. In 2002, more than four million African children died. Those who do make it past childhood are confronted with adult death rates that exceed those of 30 years ago. Life expectancy, always shorter here than almost anywhere else, is shrinking. In some African countries, it has been cut by 20 years and life expectancy for men is less than 46 years.

Mostly, death comes in familiar garb. The main causes among children are depressingly recognizable: the perinatal conditions closely associated with poverty; diarrhoeal diseases; pneumonia and other lower respiratory tract conditions; and malaria. Becoming more familiar by the day, HIV/AIDS, now the world's leading cause of death in adults aged 15–59 years, is killing almost 5000 men and women in this age group, and almost 1000 of their children, every 24 hours in sub-Saharan Africa.

The main components of Africa's tragedy are shared by many of the poorest people everywhere and include the agonizingly slow progress towards the Millennium Development Goals of reduced maternal and child mortality; the HIV/AIDS pandemic; and the double burden of communicable diseases plus noncommunicable diseases, including the tobacco epidemic and the avoidable deaths from road traffic crashes. Subsequent chapters of this report will examine each of these components and show how they can and must be reshaped for a better future.

The global picture

Life expectancy improves – but not for all

Over the past 50 years, average life expectancy at birth has increased globally by almost 20 years, from 46.5 years in 1950–1955 to 65.2 years in 2002. This represents a global average increase in life expectancy of 4 months per year across this period. On average, the gain in life expectancy was 9 years in developed countries (including Australia, European countries, Japan, New Zealand and North America), 17 years in the high-mortality developing countries (with high child and adult mortality levels), including most African countries and poorer

countries in Asia, the Eastern Mediterranean Region and Latin America; and 26 years in the low-mortality developing countries. As shown in Figure 1.1, the large life expectancy gap between the developed and developing countries in the 1950s has changed to a large gap between the high-mortality developing countries and others.

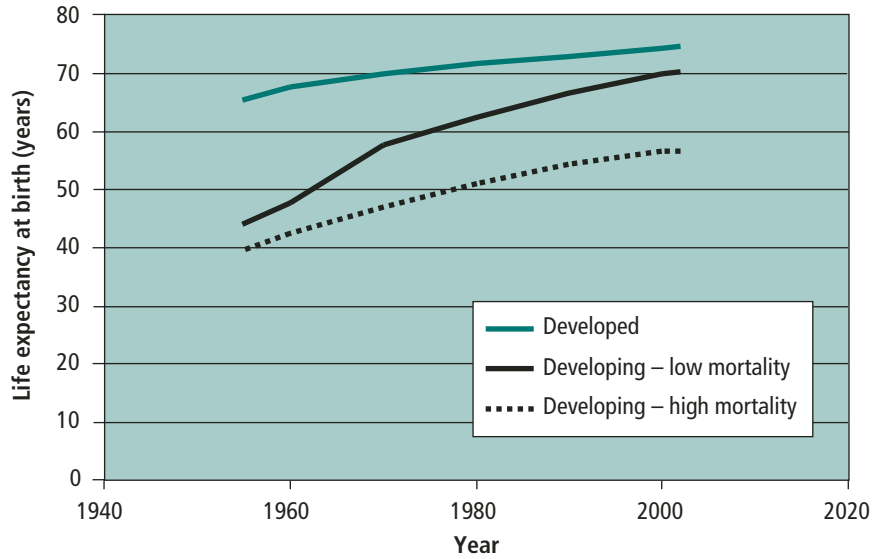
Life expectancy at birth in 2002 ranged from 78 years for women in developed countries to less than 46 years for men in sub-Saharan Africa, a 1.7-fold difference in total life expectancy. Exceptions to the life expectancy increases in most regions of the world in the last 50 years are Africa and countries of eastern Europe formerly in the Soviet Union. In the latter case, male and female life expectancies at birth declined, by 2.9 years and 1 year, respectively, over the period 1990 to 2000. Estimated life expectancies for males and females for 2002 are given in Annex Table 1 for all Member States of the World Health Organization (WHO).

The increases in life expectancy that occurred in the first half of the 20th century in developed countries were the result of rapid declines in mortality, particularly infant and maternal mortality, and that caused by infectious diseases in childhood and early adulthood. Access to better housing, sanitation and education, a trend to smaller families, growing incomes, and public health measures such as immunization against infectious diseases all contributed greatly to this epidemiological transition. In many developed countries, this shift started approximately 100 to 150 years ago. In a number of countries, such as Japan, the transition started later but proceeded much more quickly. In many developing countries, the transition started even later and has not yet been completed. In developed countries, improvements in life expectancy now come mainly from reductions in death rates among adults.

Global mortality patterns

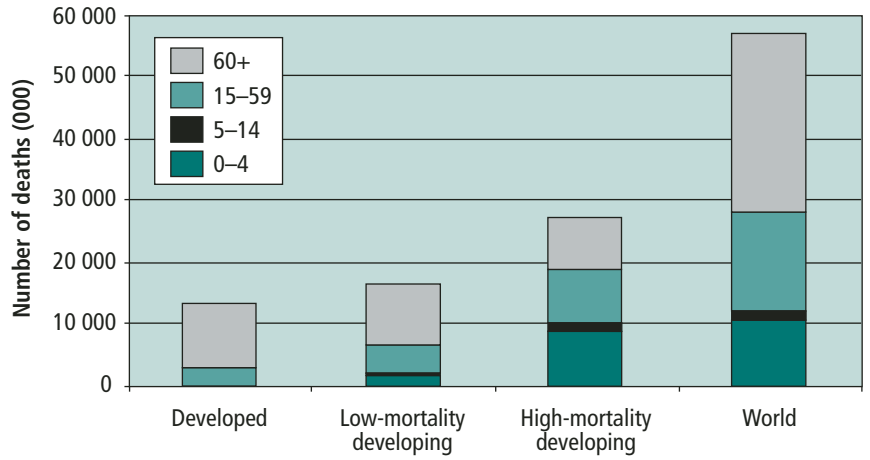
Almost 57 million people died in 2002, 10.5 million (or nearly 20%) of whom were children of less than 5 years of age (see Figure 1.2). Of these child deaths, 98% occurred in developing

Figure 1.1 Life expectancy at birth: developed and developing countries, 1955–2002



Note: The term developed countries includes Australia, Canada, European countries, former Soviet countries, Japan, New Zealand and the USA. High-mortality developing countries include those in sub-Saharan Africa, and countries with high child and adult mortality in Asia, Central and South America and the Eastern Mediterranean. Other developing countries are referred to as "developing – low mortality".

Figure 1.2 Age distribution of global mortality: developed and developing countries, 2002



countries. Over 60% of deaths in developed countries occur beyond age 70, compared with about 30% in developing countries. A key point is the comparatively high number of deaths in developing countries at younger adult ages (15–59 years). Just over 30% of all deaths in developing countries occur at these ages, compared with 20% in richer regions. This vast premature adult mortality in developing countries is a major public health concern.

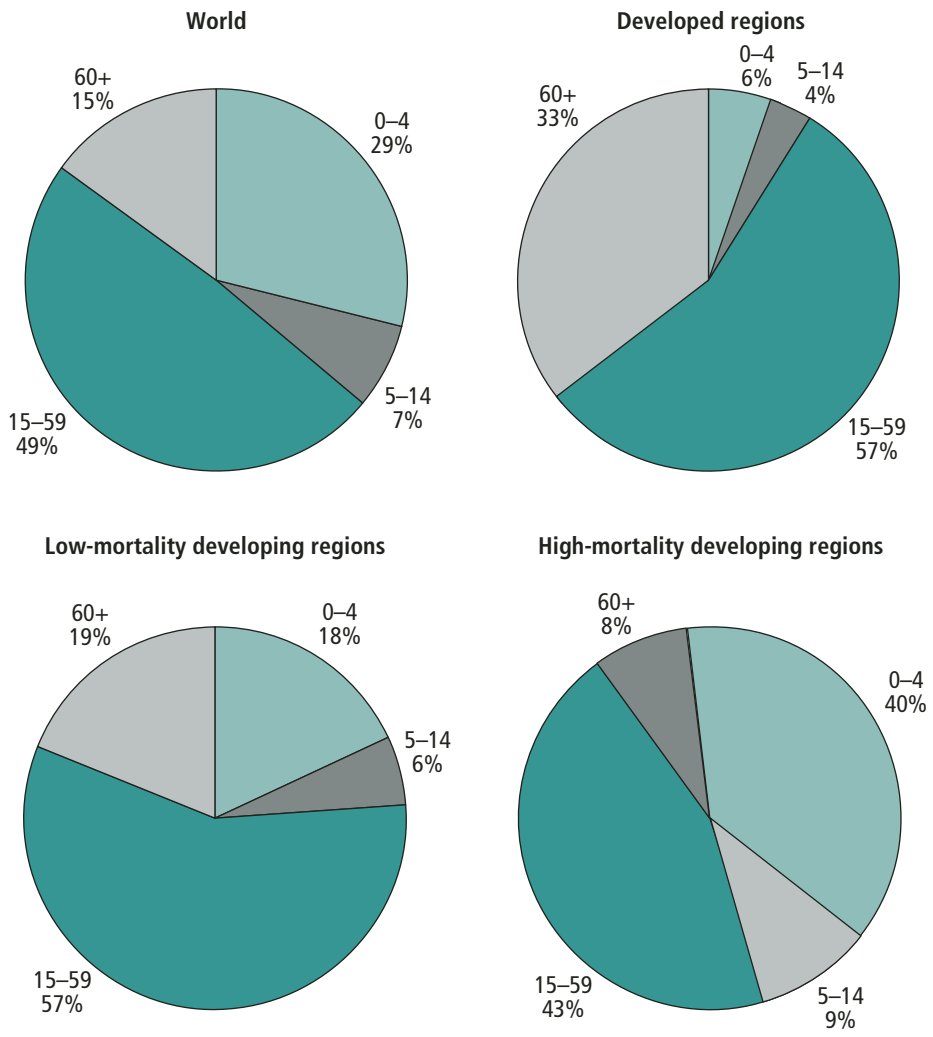
Developing countries themselves are a very heterogeneous group in terms of mortality (Figure 1.1). A contrast between low-mortality developing countries such as China (with more than one-sixth of the world's population) and high-mortality countries in Africa (with one-tenth of the global population) illustrates the extreme diversity in health conditions among developing countries. Less than 10% of deaths in China occur below 5 years of age compared with 40% in Africa. Conversely, 48% of deaths in China occur beyond age 70, compared with only 10% in Africa.[1]

Although risk of death is the simplest comparable measure of health status for populations, there has been increasing interest in describing, measuring and comparing health states of populations. Mortality statistics, in particular, substantially underestimate the burden from noncommunicable adult disease because they exclude non-fatal health outcomes such as depression and visual impairment. A useful method of formulating a composite summary of disease burden is to calculate disability-adjusted life years (DALYs), which combine years of life lost (YLLs) through premature death with years lived with disability (YLDs) *(1)*. One DALY can be thought of as one lost year of "healthy" life and the measured disease burden is the gap between a population's health status and that of a normative global reference population with high life expectancy lived in full health. In terms of DALYs, 36% of total lost years of healthy life for the world in 2002 were a result of disease and injury in children aged less than 15 years, and almost 50% as a result of disease and injury in adults aged 15–59 years (see Figure 1.3).[2]

[1] Estimated deaths by cause, age group and sex for 2002 are available on the WHO web site for the six WHO regions and for the 14 epidemiological subregions (www.who.int/evidence/bod).

[2] Estimated DALYs by cause, age group and sex for 2002 are available on the WHO web site for the six WHO regions and for the 14 epidemiological subregions (www.who.int/evidence/bod).

Figure 1.3 Distribution of disease burden (DALYs) by age group and region, 2002



As Figure 1.3 illustrates, child survival continues to be a major focus of the international health agenda for developing countries *(2)*. Because nearly 90% of global deaths under age 15 occur before the age of 5, the following sections focus on child deaths under 5 years. In contrast, the international effort to understand the magnitude of challenges to adult health in developing countries is still in its early stages. Even at present, there remains a perception that adult health is of great concern only in wealthy countries, where premature mortality among children has been substantially reduced. However, Figures 1.2 and 1.3 also illustrate the high proportion of burden of disease and injury suffered by adults in developing countries, a growing burden that requires urgent action by the global public health community. This chapter therefore first examines trends and issues in child health, focusing on ages 0–4, then among adults aged 15–59 years and among adults aged 60 years and over.

Unfortunately, complete cause-specific death registration data are routinely available for only a minority of the world's countries (see Chapter 7 and the Explanatory Notes in the Statistical Annex). However, complete or incomplete vital registration data (see Box 1.1) together

Box 1.1 Sentinel vital registration in the United Republic of Tanzania

Accurate statistics on basic demographic events are an important foundation of rational health and public policy. Unfortunately, reliable vital registration is lacking for the vast majority of the world's poorest countries. Some new approaches to meeting the need for mortality and morbidity data have been pioneered in the United Republic of Tanzania. In 1992, the Ministry of Health established the Adult Morbidity and Mortality Project (AMMP) in partnership with the University of Newcastle upon Tyne, England, and with funding from the United Kingdom Department for International Development.

AMMP developed a demographic surveillance system and verbal autopsy tools for measuring levels and causes of death, and a validated tool for estimating household consumption expenditure to monitor income poverty. One of the initial project aims was to establish baseline levels of adult mortality by cause in three selected districts *(3–5)*. In 1997, the Ministry of Health elected to expand data collection to a larger sample of districts and to establish a national sentinel system for health and poverty monitoring. In addition, the contributions of other demographic surveillance sites were coordinated to produce annual health statistics abstracts and public health sector performance profiles.

In 2002, sentinel vital registration, cause of death, and poverty monitoring figures flowing from five sites managed by the Ministry of Health and local councils and three sites managed by health development and research bodies began to provide essential indicators to the National Poverty Monitoring Master Plan. In the context of all information systems in the United Republic of Tanzania that produce demographic, health and poverty indicators, sentinel demographic surveillance generates a large number of indicators from a sample of over 500 000 people, at a per capita recurrent cost of US$ 0.02 per year. These costs are considerably less than for many other systems.

At the local level, AMMP has helped districts to feed sentinel surveillance information about the prevailing burden of disease back to community members who have, in turn, actively participated in setting priorities for district health. One local council was prompted by data on health-seeking for children dying at home from acute febrile illness to increase the resources allocated to fight malaria and to promote the use of treated bednets. At the national level, these same data provided an evidence base for a policy change in first-line malaria drug use, and the overall cause-specific mortality burden measured in years of life lost was a key input to the design of the first national package of essential health interventions. Drawing on the poverty data from sentinel sites, it has also been possible to provide government with solid evidence about how health intervention priorities among the poorest citizens differ from those of others.

with sample registration systems now capture one-third of deaths globally and provide information on 74% of global mortality, and these have been used to analyse adult mortality patterns and trends here.

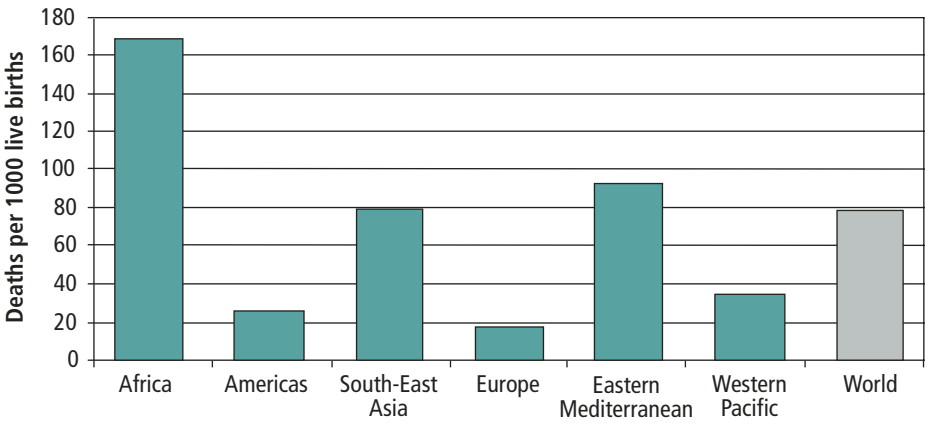
Surviving the first five years of life

Although approximately 10.5 million children under 5 years of age still die every year in the world, progress has been made since 1970, when the figure was more than 17 million. These reductions did not take place uniformly across time and regions, but the success stories in developing countries demonstrate clearly that low mortality levels are attainable in those settings. The effects of such achievements are not to be underestimated. If the whole world were able to share the current child mortality experience of Iceland (the lowest in the world in 2002), over 10 million child deaths could be prevented each year.

Today nearly all child deaths occur in developing countries, almost half of them in Africa. While some African countries have made considerable strides in reducing child mortality, the majority of African children live in countries where the survival gains of the past have been wiped out, largely as a result of the HIV/AIDS epidemic.

Across the world, children are at higher risk of dying if they are poor. The most impressive declines in child mortality have occurred in developed countries, and in low-mortality developing countries whose economic situation has improved. In contrast, the declines observed in countries with higher mortality have occurred at a slower rate, stagnated or even reversed. Owing to the overall gains in developing regions, the mortality gap between the developing and developed world has narrowed since 1970. However, because the better-off countries in developing regions are improving at a fast rate, and many of the poorer populations are losing ground, the disparity between the different developing regions is widening.

Figure 1.4 Child mortality in the six WHO regions, 2002



Child mortality: global contrasts

Regional child mortality levels are indicated in Figure 1.4. Of the 20 countries in the world with the highest child mortality (probability of death under 5 years of age), 19 are in Africa, the exception being Afghanistan.

A baby born in Sierra Leone is three and a half times more likely to die before its fifth birthday than a child born in India, and more than a hundred times more likely to die than a child born in Iceland or Singapore. Fifteen countries, mainly European but including Japan and Singapore, had child mortality rates in 2002 of less than 5 per 1000 live births. Estimated child mortality rates for 2002 are given for all WHO Member States in Annex Table 1.

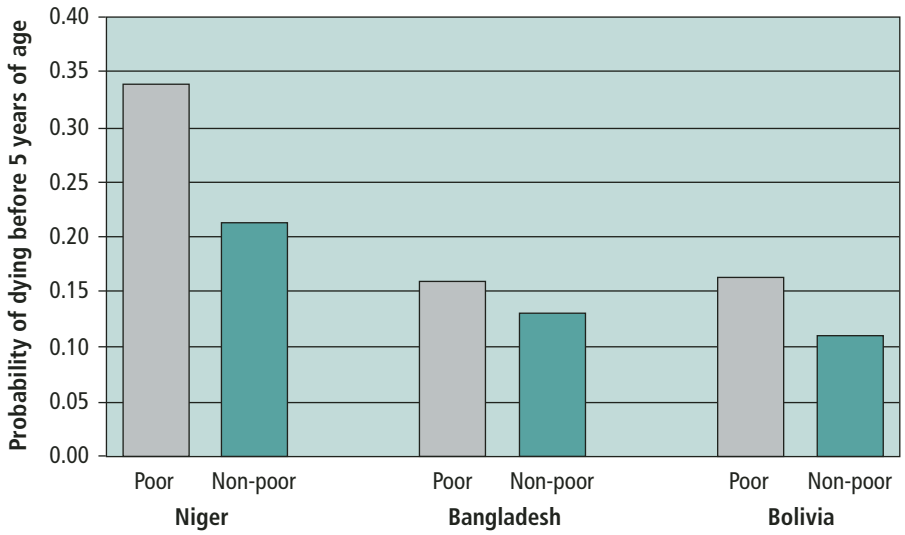
Child mortality: gender and socioeconomic differences

Throughout the world, child mortality is higher in males than in females, with only a few exceptions. In China, India, Nepal and Pakistan, mortality in girls exceeds that of boys. This disparity is particularly noticeable in China, where girls have a 33% higher risk of dying than their male counterparts. These inequities are thought to arise from the preferential treatment of boys in family health care-seeking behaviour and in nutrition.

There is considerable variability in child mortality across different income groups within countries. Data collected by 106 demographic and health surveys in more than 60 countries show that children from poor households have a significantly higher risk of dying before the age of 5 years than the children of richer households. This is illustrated in Figure 1.5, using the results for three countries from different regions. The vertical axis represents the probability of dying in childhood (on a zero to one scale). The horizontal axis shows the information by "poor" and "non-poor".[1] The identification of poor and non-poor populations uses a global scale based on an estimate of permanent income constructed from information on ownership of assets, availability of services and household characteristics. This approach has the advantage of allowing comparison of socioeconomic levels across countries. It implies that the individuals defined as poor in Bangladesh have the same economic status as the population defined as poor in Bolivia or Niger.

[1] The "poor" are individuals from the lowest quintile of income, while the "non-poor" are the remainder.

Figure 1.5 Differences in child mortality in three developing countries according to socioeconomic status



There are significant differences in child mortality risks by poverty status in all countries, although the size of the gap varies; the risk of dying in childhood is approximately 13 percentage points higher for the poor than for the non-poor in Niger but less than 3 percentage points higher in Bangladesh.

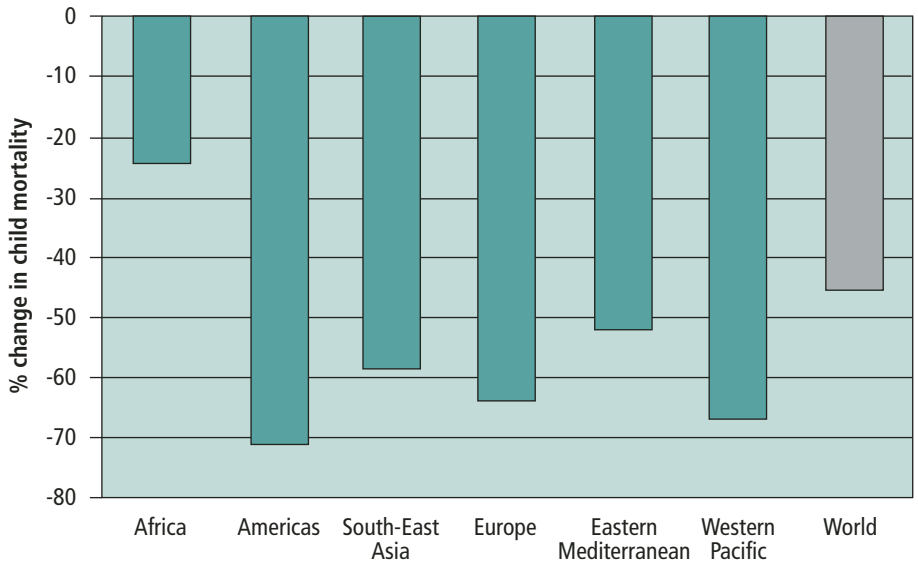
Child mortality rates among the poor are much higher in Africa than in any other region despite the same level of income used to define poverty. The probability of poor children in Africa dying is almost twice that of poor children in the Americas. Likewise, better-off children in Africa have double the probability of dying than their counterparts in the Americas. Moreover, better-off children in Africa have a higher mortality risk (16%) than poor children in the Americas, whose risk of death is 14%.

Child survival: improvements for some

The last three decades have witnessed considerable gains in child survival worldwide (shown by WHO region in Figure 1.6). Global child mortality decreased from 147 per 1000 live births in 1970 to about 80 per 1000 live births in 2002. The reduction in child mortality has been particularly compelling in certain countries of the Eastern Mediterranean and South-East Asia Regions and Latin America, while that of African countries was more modest. Gains in child survival have also occurred in rich industrialized nations, where levels of mortality were already low.

Although child mortality has fallen in most regions of the world, the gains were not consistent across time and regions. The greatest reductions in child mortality across the world occurred 20–30 years ago, though not in the African or the Western Pacific Regions, where the decline slowed down during the 1980s, nor in some eastern European countries, where mortality actually increased in the 1970s. Over the past decade, only countries of the South-East Asia Region and the higher mortality countries in Latin America have further accelerated their reduction in child mortality.

Figure 1.6 Changes in child mortality rates by WHO region, 1970–2002



The most impressive gains in child survival over the past 30 years occurred in developing countries where child mortality was already relatively low, whereas countries with the highest rates had a less pronounced decline. Despite an overall decline in global child mortality over the past three decades, the gap between and within developing regions has widened.

Although the chances of child survival among less developed regions of the world are becoming increasingly disparate, the gaps in child mortality among affluent nations have been closing over the past 30 years, largely as a result of medico-technological advances, particularly in the area of neonatal survival.

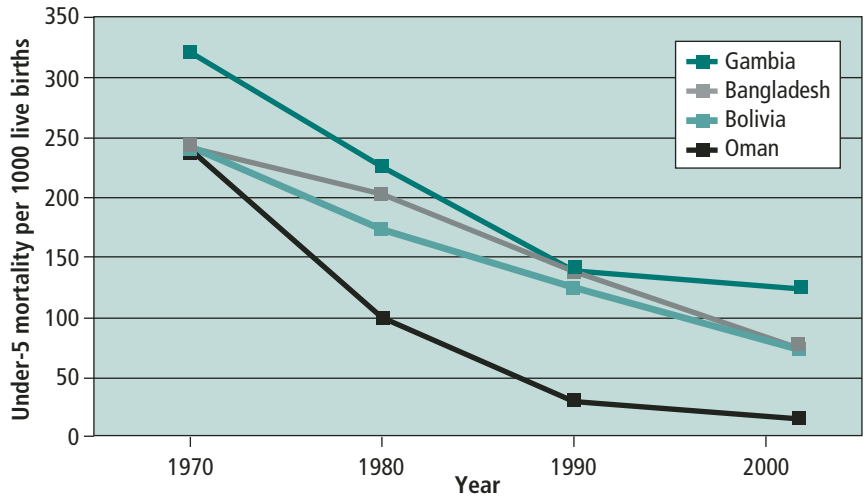
In 16 countries (14 of which are in Africa) current levels of under-5 mortality are higher than those observed in 1990. In nine countries (eight of which are in Africa) current levels exceed even those observed over two decades ago. HIV/AIDS has played a large part in these reversals.

Analyses from the demographic and health surveys show that, while child mortality has increased in many of the African countries surveyed, the gap between poor and non-poor populations has remained constant over time in this setting. In contrast, there has been a widening of the mortality gap between poor and better-off groups in the Americas, where overall child mortality rates have fallen. This indicates that survival gains in many regions have benefited the better-off. The reduction in child mortality has been much slower in rural areas, where poor people are concentrated, than in urban areas *(6)*. These analyses suggest that health interventions implemented in the past decade have not been effective in reaching poor people.

Losses in child survival in the countries described above are at odds with impressive gains in some African countries. Despite the ravages of the HIV/AIDS epidemic in Africa, eight countries in the region have reduced child mortality by more than 50% since 1970. Among these are Gabon, the Gambia and Ghana.

Overall, at least 169 countries, 112 of them developing countries, have shown a decline in child mortality since 1970. Some of these are presented in Figure 1.7. Oman has had the most

Figure 1.7 Countries with large absolute reductions in child mortality since 1970



striking reduction, from 242 per 1000 live births in 1970 to its current rate of 15 per 1000 live births, which is lower than that of many countries in Europe. Overall, the lower mortality countries of the Eastern Mediterranean Region experienced an impressive decline in child mortality, which has been accompanied by a reduction in the gap between countries' child mortality levels since 1970.

Child mortality has also declined substantially in the Americas. The most striking proportional reductions in mortality have been seen in Chile, Costa Rica and Cuba, where child mortality has decreased by over 80% since 1970. There have also been large absolute reductions in child mortality in Bolivia, Nicaragua and Peru. In contrast, Haitian child mortality rates are still 133 per 1000: almost double the mortality rate of Bolivia, the next highest country in the Americas.

An interesting pattern of child mortality trends has been observed in several eastern European countries. Here, child mortality initially increased or remained constant during the 1970s, only to decline after 1980 *(7)*. This may to some extent be attributed to a more complete registration of child and infant deaths during that period. Interestingly, while adult mortality levels increased in the early 1990s, child mortality continued to decline. There is no other region where this particular pattern of mortality has occurred in such a systematic manner, and the reasons for the trend remain poorly understood.

Causes of death in children

Infectious and parasitic diseases remain the major killers of children in the developing world, partly as a result of the HIV/AIDS epidemic. Although notable success has been achieved in certain areas (for example, polio), communicable diseases still represent seven out of the top 10 causes of child deaths, and account for about 60% of all child deaths. Overall, the 10 leading causes represent 86% of all child deaths (see Table 1.1).

Many countries of the Eastern Mediterranean Region and in Latin America and Asia have partly shifted towards the cause-of-death pattern observed in developed countries. Here, conditions arising in the perinatal period, including birth asphyxia, birth trauma and low birth weight, have replaced infectious diseases as the leading cause of death and are now

Table 1.1 Leading causes of death in children in developing countries, 2002

Rank	Cause	Numbers (000)	% of all deaths
1	Perinatal conditions	2 375	23.1
2	Lower respiratory infections	1 856	18.1
3	Diarrhoeal diseases	1 566	15.2
4	Malaria	1 098	10.7
5	Measles	551	5.4
6	Congenital anomalies	386	3.8
7	HIV/AIDS	370	3.6
8	Pertussis	301	2.9
9	Tetanus	185	1.8
10	Protein-energy malnutrition	138	1.3
	Other causes	1 437	14.0
	Total	**10 263**	**100**

responsible for one-fifth to one-third of deaths. Such a shift in the cause-of-death pattern has not occurred in sub-Saharan Africa, where perinatal conditions rank in fourth place. Here, undernutrition, malaria, lower respiratory tract infections and diarrhoeal diseases continue to be among the leading causes of death in children, accounting for 45% of all deaths.

About 90% of all HIV/AIDS and malaria deaths in children in developing countries occur in sub-Saharan Africa, where 23% of the world's births and 42% of the world's child deaths are observed (see Box 1.2). The immense surge of HIV/AIDS mortality in children in recent years means that HIV/AIDS is now responsible for 332 000 child deaths in sub-Saharan Africa, nearly 8% of all child deaths in the region.

Some progress has been observed in the areas of diarrhoeal diseases and measles. While incidence is thought to have remained stable, mortality from diarrhoeal diseases has fallen from 2.5 million deaths in 1990 to about 1.6 million deaths in 2002, now accounting for 15% of all child deaths. There has also been a modest decline in deaths from measles, although more than half a million children under 5 years of age still succumb to the disease every year *(8)*. Malaria causes around a million child deaths per year, of which 90% are children under 5 years of age. In this age group the disease accounts for nearly 11% of all deaths (see Table 1.1).

The overall number of child deaths in India has fallen from approximately 3.5 million in 1990 to approximately 2.3 million in 2002. This impressive decline is a result of a reduction in overall child mortality rates of about 30%, and a decline in total fertility rates of around 10%. The cause-of-death pattern has remained fairly stable, with the exception of perinatal conditions whose proportion has notably increased. There were some declines in the proportion of deaths from diarrhoeal diseases, measles and tetanus, which may be the result of increased use of oral rehydration therapy and improved coverage of routine vaccination, as well as intensive immunization campaigns.

A similar picture is emerging in China, where the number of child deaths has decreased by 30% since 1990, owing to a reduction in child mortality of 18% and a 6% decline in total fertility. As in India, the most notable change in the cause-of-death pattern in China over the past decade is an increase in the proportion of perinatal deaths.

The challenge of reducing child mortality is widely recognized and effective interventions are available. The issue now is urgent implementation. The adult mortality challenges are more complex, as described in the next section.

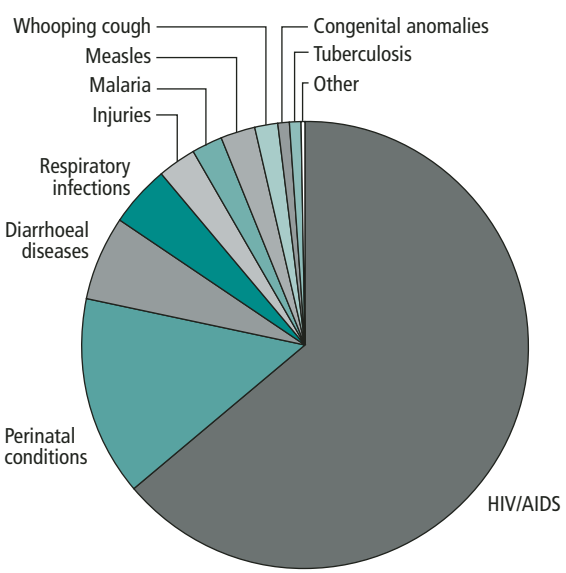
Adult health at risk: slowing gains and widening gaps

Adult mortality rates have been declining in recent decades in most regions of the world. Life expectancy at age 15 has increased by between 2 and 3 years for most regions over the last 20 years. The notable exceptions are the high-mortality countries in Africa, where life expect-

Box 1.2 The African crisis of child mortality

There are 14 countries in WHO's African Region in which child mortality has risen since reaching its lowest level in 1990. About 34% of the population under five years of age in sub-Saharan Africa is now exposed to this disturbing trend. Only two countries outside Africa observed similar setbacks in the same period – countries that experienced armed conflict or economic sanctions. Eight of the 14 countries are in southern Africa, which boasted some of the most notable gains in child survival during the 1970s and 1980s. Those promising gains have been wiped out in a mere decade.

Causes of child deaths in Botswana, 2002



The surge of HIV/AIDS is directly responsible for up to 60% of child deaths in Africa, as illustrated by the causes of child deaths in Botswana shown in the figure.

The indirect effects of HIV/AIDS in adults contribute to the tragedy. Children who lose their mothers to HIV/AIDS are more likely to die than children with living mothers, irrespective of their own HIV status. The diversion of already stretched health resources away from child health programmes into care of people living with AIDS further compounds the situation, in the presence of increasing malaria mortality, civil unrest or social anarchy.

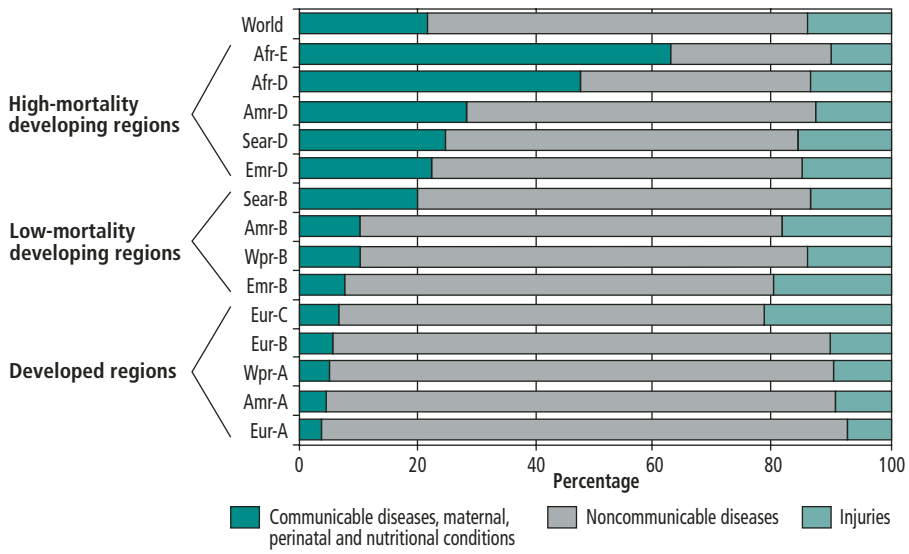
ancy at age 15 decreased by nearly 7 years between 1980 and 2002, and the high-mortality countries, mainly those of the former Soviet Union, in eastern Europe, where life expectancy at age 15 decreased over the same period by 4.2 years for males and 1.6 years for females.

Of the 45 million deaths among adults aged 15 years and over in 2002, 32 million, or almost three-quarters, were caused by noncommunicable diseases, which killed almost four times as many people as communicable diseases and maternal, perinatal and nutritional conditions combined (8.2 million, or 18% of all causes). Injuries killed a further 4.5 million adults in 2002, 1 in 10 of the total adult deaths. More than 3 million of these injury deaths – almost 70% of them – concern males, whose higher risk is most pronounced for road traffic injuries (three times higher) and for violence and war (more than four times higher).

The relative importance of these causes varies markedly across regions. Thus in Africa, only about 1 in 3 adult deaths is caused by noncommunicable diseases, compared with nearly 9 out of 10 in developed countries. It is of concern that 3 in 4 adult deaths in Latin America and in the developing countries of Asia and the Western Pacific Region are caused by noncommunicable disease, reflecting the relatively advanced stage of the epidemiological transition achieved in these populations and the emergence of the double burden of disease. Estimated total deaths by cause in 2002 are given for each of the epidemiological subregions and the world in Annex Table 2. More detailed tables showing deaths by cause, age and sex in each of the regions are available on the WHO web site (http://www.who.int/evidence/bod).

Figure 1.8 highlights the marked contrast in patterns of health transition among adults (aged 15 years and over) in different parts of the world. In developed countries, communicable diseases and maternal, perinatal and nutritional conditions contribute only 5% to the total burden of disease, while in high-mortality developing regions this figure rises to 40%. In African regions where the HIV/AIDS epidemic has confounded the pattern of health transition during the past decade, these conditions can contribute as much as 50–60% of the over-

Figure 1.8 Disease burden (DALYs) among adults (aged 15 years and over) by broad cause, selected epidemiological subregions, 2002



See List of Member States for an explanation of subregions.

all disease burden. Estimated total DALYs by cause in 2002 are given for each of the epidemiological subregions and the world in Annex Table 3.

The 10 leading causes of disease burden among men and women aged 15 years and over are shown in Table 1.2. Ischaemic heart disease and stroke (cerebrovascular disease) are two of the three leading causes of burden of disease in adult males globally. HIV/AIDS is the leading cause for males and the second leading cause for females, accounting for around 6% of the global burden of disease. Unipolar depressive disorders are the leading cause of burden for females, reflecting their higher prevalence in women. Though the individual maternal conditions of haemorrhage, sepsis and obstructed labour do not appear in Table 1.2, as a group they remain one of the leading causes of the burden of disease for women globally, reflecting the continuing high levels of maternal mortality in many developing countries, and also the high levels of disability resulting from these conditions.

Table 1.2 Leading causes of disease burden (DALYs) for males and females aged 15 years and older, worldwide, 2002

	Males	%DALYs		Females	%DALYs
1	HIV/AIDS	7.4	1	Unipolar depressive disorders	8.4
2	Ischaemic heart disease	6.8	2	HIV/AIDS	7.2
3	Cerebrovascular disease	5.0	3	Ischaemic heart disease	5.3
4	Unipolar depressive disorders	4.8	4	Cerebrovascular disease	5.2
5	Road traffic injuries	4.3	5	Cataracts	3.1
6	Tuberculosis	4.2	6	Hearing loss, adult onset	2.8
7	Alcohol use disorders	3.4	7	Chronic obstructive pulmonary disease	2.7
8	Violence	3.3	8	Tuberculosis	2.6
9	Chronic obstructive pulmonary disease	3.1	9	Osteoarthritis	2.0
10	Hearing loss, adult onset	2.7	10	Diabetes mellitus	1.9

The following section summarizes the risk of premature adult death in terms of the probability of death between 15 and 60 years of age – the proportion of 15-year-olds who will die before their 60th birthday – and examines global patterns of cause of death in the age range 15–59 years. The health of adults aged 60 years and older is then examined.

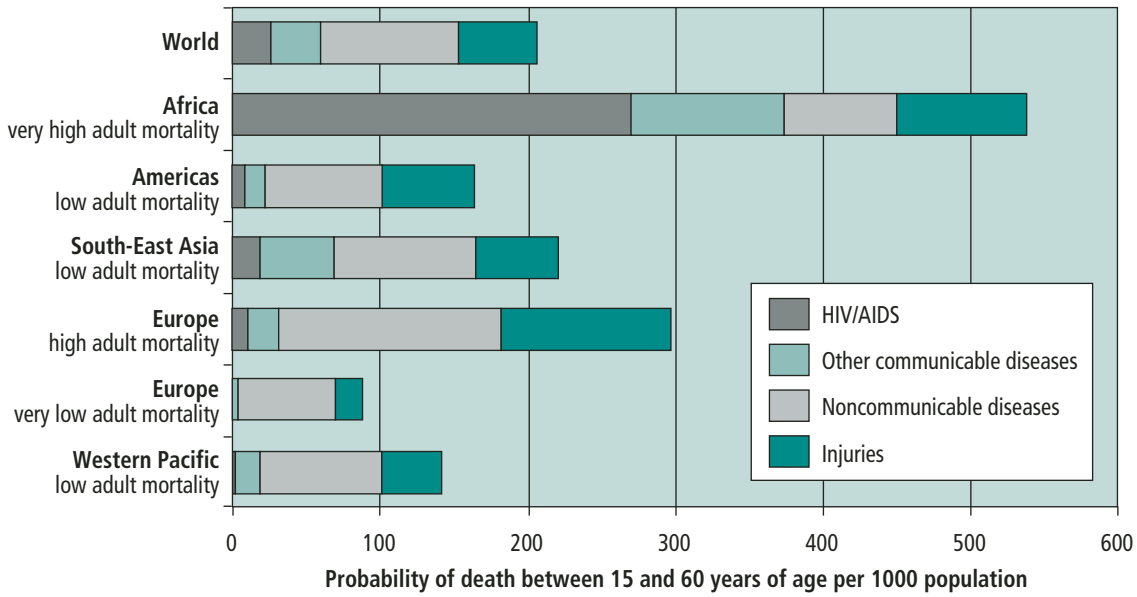
Global patterns of premature mortality risk

The probability of premature adult death varies widely between regions, as shown in Figure 1.9. For example, the probability of premature adult death in some parts of sub-Saharan Africa is much higher – nearly four times higher – than that observed in low-mortality countries of the Western Pacific Region. Even within developed regions there are wide variations. Men in some eastern European countries are three to four times more likely to die prematurely than men in other developed regions. Furthermore, male adult mortality in eastern Europe is much greater than in developing countries of the Americas, Asia and the Eastern Mediterranean Region. In all regions, male mortality is higher than female, and the discrepancy between the two sexes in mortality risk is much larger than that seen among children. The variation in the proportion of women dying prematurely is much less dramatic.

Adult mortality trends: 15–59 years of age

There have been impressive gains in the health status of adults worldwide in the past five decades. The risk of death between ages 15 and 60 has declined substantially from a global average of 354 per 1000 in 1955 to 207 per 1000 in 2002. The recent slowdown in the rate of decline is a clear warning that continued reductions in adult mortality, particularly in developing countries, will not be easily achieved.

Figure 1.9 Adult mortality: probabilities of death between 15 and 60 years of age by cause, selected epidemiological subregions, 2002

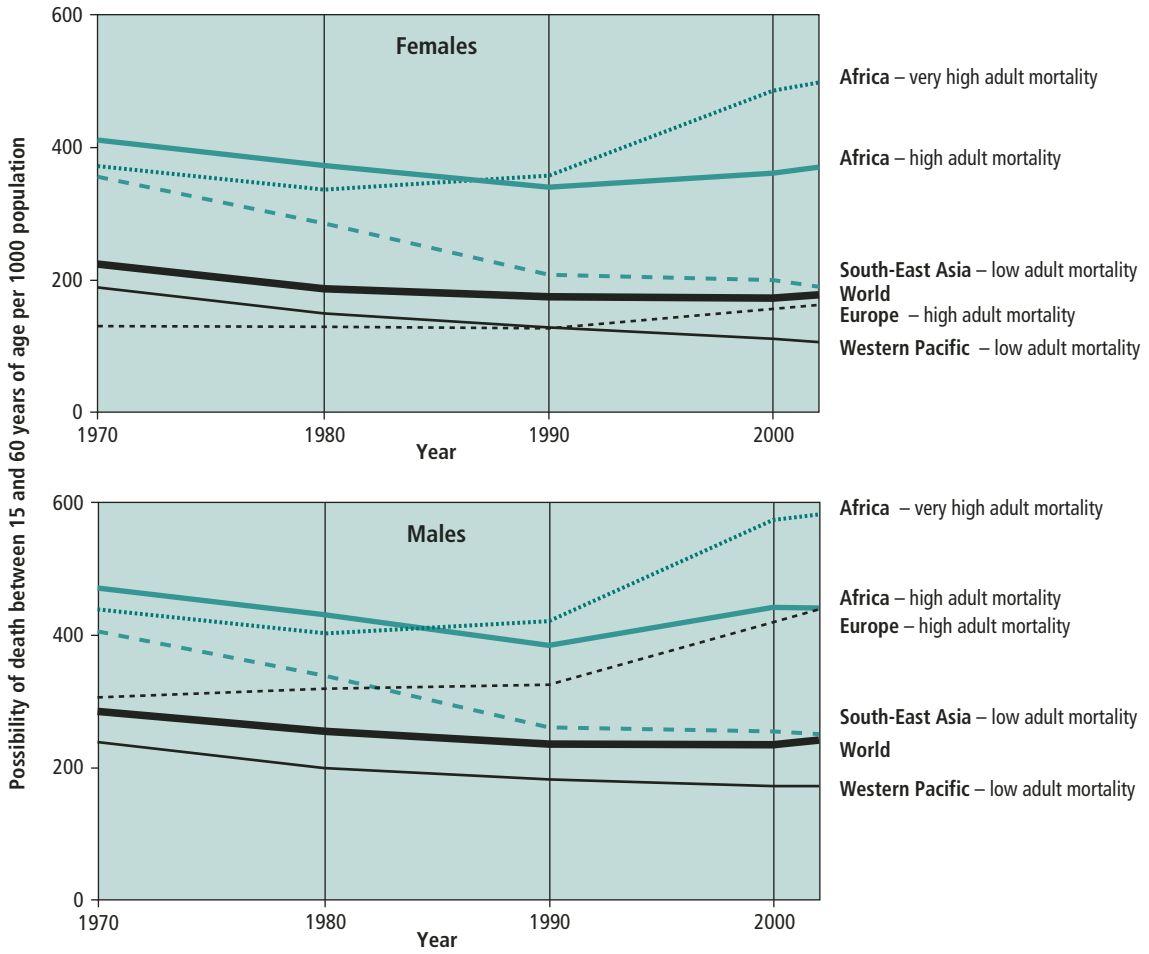


See List of Member States for an explanation of subregions.

There is substantial variation in the pace and magnitude of declining trends in premature adult mortality across both sexes and global regions (see Figure 1.10). The global slowdown of the pace is primarily a result of a shift in trends in adult mortality in a few regions. Among the signs of deteriorating adult health, the most disturbing is the fact that adult mortality in Africa has reversed, shifting in 1990 from a state of steady decline into a situation characterized by rapidly increasing mortality. The reversal in parts of sub-Saharan Africa has been so drastic that current adult mortality rates today exceed the levels of three decades ago. In Zimbabwe, upturns in reported adult deaths were significantly greater in 1991–1995 than in 1986–1990. Older childhood and older adult mortality have changed little *(9)*. Without HIV/AIDS, life expectancy at birth in the African Region would have been almost 6.1 years higher in 2002. The reduction in life expectancy varies significantly across the African Region. The greatest impact has been in Botswana, Lesotho, Swaziland and Zimbabwe, where HIV/AIDS has reduced male and female life expectancies by more than 20 years.

The fragile state of adult health in the face of social, economic and political instability is also apparent in regions outside Africa. Male mortality in some countries in eastern Europe has increased substantially and is approaching the level of adult mortality in some African

Figure 1.10 Trends of adult mortality by sex, selected epidemiological subregions, 1970–2002



See List of Member States for an explanation of subregions.

countries. As a result, for the European Region as a whole, average adult mortality risk for men between 15 and 60 years is 230 per 1000, which is similar to the rate observed in the 1980s. This contrasts with the continuously declining trend for women in this region as a whole. Their risk has declined from 130 in 1970 to 98 in 2002. Figure 1.8 illustrates the fact that the probability of death from injury among adults aged 15–59 years in the high-mortality countries of eastern Europe is nearly six times higher than in neighbouring western European countries.

Adult mortality: widening gaps

Continuously declining adult mortality in low-mortality regions, combined with trend reversals in high-mortality areas, have resulted in widening gaps in adult mortality worldwide. The gap between the lowest and highest regional adult mortality risk between ages 15 and 60 has now increased to a level of 340 per 1000 in 2002. Regional aggregation of adult mortality also hides enormous and sobering disparities between countries. For example, within the Eastern Mediterranean Region, adult mortality risk between ages 15 and 60 among women in Djibouti was seven times higher than that of women in Kuwait in 2002. Overall, there is an almost 12-fold difference between the world's lowest and highest adult mortality at country level (see Annex Table 1).

HIV/AIDS: the leading health threat

Table 1.3 shows the leading causes of deaths and DALYs among adults worldwide for 2002. Despite global trends of declining communicable disease burden in adults, HIV/AIDS has become the leading cause of mortality and the single most important contributor to the burden of disease among adults aged 15–59 years (see Chapter 3).

Table 1.3 Leading causes of mortality and disease burden (DALYs) among adults, worldwide, 2002

Mortality – adults aged 15–59

Rank	Cause	Deaths (000)
1	HIV/AIDS	2279
2	Ischaemic heart disease	1332
3	Tuberculosis	1036
4	Road traffic injuries	814
5	Cerebrovascular disease	783
6	Self-inflicted injuries	672
7	Violence	473
8	Cirrhosis of the liver	382
9	Lower respiratory infections	352
10	Chronic obstructive pulmonary disease	343

Mortality – adults aged 60+

Rank	Cause	Deaths (000)
1	Ischaemic heart disease	5825
2	Cerebrovascular disease	4689
3	Chronic obstructive pulmonary disease	2399
4	Lower respiratory infections	1396
5	Trachea, bronchus, lung cancers	928
6	Diabetes mellitus	754
7	Hypertensive heart disease	735
8	Stomach cancer	605
9	Tuberculosis	495
10	Colon and rectum cancers	477

Disease burden – adults aged 15–59

Rank	Cause	DALYs (000)
1	HIV/AIDS	68 661
2	Unipolar depressive disorders	57 843
3	Tuberculosis	28 380
4	Road traffic injuries	27 264
5	Ischaemic heart disease	26 155
6	Alcohol use disorders	19 567
7	Hearing loss, adult onset	19 486
8	Violence	18 962
9	Cerebrovascular disease	18 749
10	Self-inflicted injuries	18 522

Disease burden – adults aged 60+

Rank	Cause	DALYs (000)
1	Ischaemic heart disease	31 481
2	Cerebrovascular disease	29 595
3	Chronic obstructive pulmonary disease	14 380
4	Alzheimer and other dementias	8 569
5	Cataracts	7 384
6	Lower respiratory infections	6 597
7	Hearing loss, adult onset	6 548
8	Trachea, bronchus, lung cancers	5 952
9	Diabetes mellitus	5 882
10	Vision disorders, age-related and other	4 766

Nearly 80% of the almost 3 million global deaths from HIV/AIDS in 2002 occurred in sub-Saharan Africa. As stated earlier, HIV/AIDS is the leading cause of death in this region. It causes more than 6000 deaths every day and accounts for one in two deaths of adults aged 15–59 years. It has reversed mortality trends among adults in this region and turned previous gains in life expectancy into a continuous decline in life expectancy since 1990.

Mortality and disease among older adults

In developing countries, 42% of adult deaths occur after 60 years of age, compared with 78% in developed countries. Globally, 60-year-olds have a 55% chance of dying before their 80th birthday. Regional variations in risk of death at older ages are smaller, ranging from around 40% in the developed countries of western Europe to 60% in most developing regions and 70% in Africa. Historical data from countries such as Australia and Sweden show that life expectancy at age 60 changed slowly during the first six to seven decades of the 20th century but, since around 1970, has started to increase substantially. Life expectancy at age 60 has now reached 25 years in Japan. From 1990 onwards, eastern European countries such as Hungary and Poland have started to experience similar improvements in mortality for older people, but others, such as the Russian Federation, have not, and are experiencing worsening trends. The leading causes of mortality and burden of disease in older people have not changed greatly over the past decade.

The growing burden of noncommunicable diseases

The burden of noncommunicable diseases is increasing, accounting for nearly half of the global burden of disease (all ages), a 10% increase from estimated levels in 1990. While the proportion of burden from noncommunicable diseases in developed countries remains stable at over 80% in adults aged 15 years and over, the proportion in middle-income countries has already exceeded 70%. Surprisingly, almost 50% of the adult disease burden in the high-mortality regions of the world is now attributable to noncommunicable diseases. Population ageing (see Box 1.3) and changes in the distribution of risk factors have accelerated the epidemic of noncommunicable diseases in many developing countries *(10)*.

Box 1.3 Population ageing

A demographic revolution is under way throughout the world. Today, there are around 600 million people in the world aged 60 years and over. This total will double by 2025 and by 2050 will reach two billion, the vast majority of whom will be in the developing world. Such accelerated global population ageing will increase economic and social demands on all countries.

While the consequences of population ageing in the areas of health and income security are already at the centre of discussions by policymakers and planners in the developed world, the speed and impact of population ageing in the less developed regions are yet to be fully appreciated. By 2025, in countries such as Brazil, China and Thailand, the proportion of older people will be above 15% of the population, while in Colombia, Indonesia and Kenya the absolute numbers will increase by up to 400% over the next 25 years – up to eight times higher than the increases in already aged societies in western Europe where population ageing occurred over a much longer period of time *(11)*.

Population ageing is driven by two factors: a decline in the proportion of children, reflecting declines in fertility rates in the overall population, and an increase in the proportion of adults 60 years of age and over as mortality rates decline. This demographic transition will bring with it a number of major challenges for health and social policy planners. As populations age, the burden of noncommunicable diseases increases. Evidence from developed countries, however, shows that the prevalence of chronic diseases and the levels of disability in older people can be reduced with appropriate health promotion and strategies to prevent noncommunicable diseases. It is of great concern that the prevalence of risk factors for chronic diseases is on the increase in developing countries. Opportunities missed by health systems to deal with or manage age-related noncommunicable diseases will lead to increases in the incidence, prevalence and complications of these diseases and may take resources away from other priorities, such as child and maternal health.

Improving health systems and their responses to population ageing makes economic sense. With old-age dependency ratios increasing in virtually all countries of the world, the economic contributions and productive roles of older people will assume greater importance. Supporting people to remain healthy and ensure a good quality of life in their later years is one of the greatest challenges for the health sector in both developed and developing countries *(12)*.

Cardiovascular diseases account for 13% of the disease burden among adults over 15 years of age. Ischaemic heart disease and cerebrovascular disease (stroke) are the two leading causes of mortality and disease burden among older adults (over age 60). In developed countries, ischaemic heart disease and cerebrovascular disease are together responsible for 36% of deaths, and death rates are higher for men than women. The increase in cardiovascular mortality in eastern European countries has been offset by continuing declines in many other developed countries. In contrast, the mortality and burden resulting from cardiovascular diseases are rapidly increasing in developing regions (see Chapter 6).

Of the 7.1 million cancer deaths estimated to have occurred in 2002, 17% were attributable to lung cancer alone and of these, three-quarters occurred among men *(13)*. There were an estimated 1.2 million lung cancer deaths in 2000, an increase of nearly 30% in the 10 years from 1990, reflecting the emergence of the tobacco epidemic in low-income and middle-income countries.

Stomach cancer, which until recently was the leading cause of cancer mortality worldwide, has been declining in all parts of the world where trends can be reliably assessed, and now causes 850 000 deaths each year, or about two-thirds as many as lung cancer. Liver and colon/rectum cancers are the third and fourth leading causes. More than half of all liver cancer deaths are estimated to occur in the Western Pacific Region. Among women, the leading cause of cancer deaths is breast cancer. During the past decade, breast cancer survival rates have been improving, though the chance of survival varies according to factors such as coverage and access to secondary prevention. Globally, neuropsychiatric conditions account for 19% of disease burden among adults (see Box 1.4), almost all of this resulting from non-fatal health outcomes.

Injuries – a hidden epidemic among young men

Injuries, both unintentional and intentional, primarily affect young adults, often resulting in severe disabling consequences. Overall, injuries accounted for over 14% of adult disease burden in the world in 2002. In parts of the Americas, eastern Europe and the Eastern Mediterranean Region, more than 30% of the entire disease burden among male adults aged 15–44 years is attributable to injuries.

Box 1.4 The burden of mental ill-health

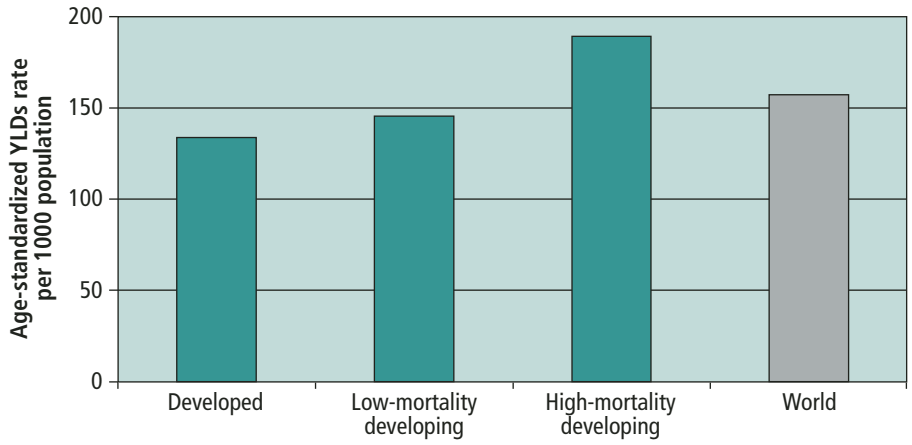
Mental, neurological and substance use disorders cause a large burden of disease and disability: globally, 13% of overall disability-adjusted life years (DALYs) and 33% of overall years lived with disability (YLDs). Behind these stark figures lies human suffering: more than 150 million people suffer from depression at any point in time; nearly 1 million commit suicide every year; and about 25 million suffer from schizophrenia, 38 million from epilepsy, and more than 90 million from an alcohol or drug use disorder.

A large proportion of individuals do not receive any health care for their condition, firstly because the mental health infrastructure and services in most countries are grossly insufficient for the large and growing needs *(14)* and, secondly, because widely prevalent stigma and discrimination prevent them from seeking help. A policy for mental health care is lacking in 40% of countries, and 25% of those with a policy assign no budget to implement it. Even where a budget exists, it is very small: 36% of countries devote less than 1% of their total health resources to mental health care. Though community-based services are recognized to be the most effective, 65% of all psychiatric beds are still in mental hospitals – cutting into the already meagre budgets while providing largely custodial care in an environment that may infringe patients' basic human rights.

Cost-effective health care interventions are available. Recent research clearly demonstrates that disorders such as depression, schizophrenia, alcohol problems and epilepsy can be treated within primary health care. Such treatment is well within the reach of even low-income countries and will reduce substantially the overall burden of these disorders. Interventions rely on inexpensive medicines that are commonly available and, for the most part, free of patent restrictions, and basic training of health professionals *(15)*.

Mental health also has an impact on health care systems in other ways. A large proportion of people with chronic physical diseases such as diabetes and hypertension, malignancies and HIV/AIDS suffer from concurrent depression, which significantly interferes with their adherence to health care regimens. Behavioural and lifestyle factors are also responsible for many communicable and noncommunicable diseases *(10)*. Though these links have been recognized, most countries are not adequately using this information to enhance the effectiveness of their health care systems.

Figure 1.11 Age-standardized rate of years lived with disability (YLDs): developed and developing countries, 2002



Among men, road traffic injuries, violence and self-inflicted injuries are all among the top 10 leading causes of disease burden in the 15–44-year-old age group. Globally, road traffic injuries are the third leading cause of burden in that age and sex group, preceded only by HIV/AIDS and unipolar depression. The burden of road traffic injuries is increasing, especially in the developing countries of sub-Saharan Africa and South-East Asia, and particularly affects males (see Chapter 6).

Intentional injuries, a group that includes self-inflicted injuries and suicide, violence and war, account for an increasing share of the burden, especially among economically productive young adults. In developed countries, suicides account for the largest share of intentional injury burden whereas, in developing regions, violence and war are the major causes. Countries of the former Soviet Union and other high-mortality countries of eastern Europe have rates of injury death and disability among males that are similar to those in sub-Saharan Africa.

Non-fatal health outcomes

The overall burden of non-fatal disabling conditions is dominated by a relatively short list of causes. In all regions, neuropsychiatric conditions, largely depression, are the most important causes of disability, accounting for over 35% of YLDs among adults (aged 15 and over). Their disabling burden is almost the same for men and women, but the major contributing causes are different. The burden of depression is 50% higher for women than for men, and women also have higher burden from anxiety disorders, migraine and senile dementias. In contrast, the burden for alcohol and drug use disorders is nearly six times higher in men than in women, and accounts for one-quarter of the male neuropsychiatric burden.

In high-mortality developing regions, visual impairment, hearing loss and HIV/AIDS are the other major contributors to YLDs. In developed and low-mortality developing regions, visual impairment, hearing loss, musculoskeletal disease, chronic obstructive pulmonary disease, and other noncommunicable diseases, particularly stroke, account for the majority of adult disability.[1]

[1] Estimated YLDs by cause, age group and sex for 2002 are available on the WHO web site for the six WHO regions and for the 14 epidemiological subregions (www.who.int/evidence/bod).

Surprisingly, more than 80% of global YLDs are in developing countries and nearly half occur in high-mortality developing countries. Figure 1.11 shows higher rates of YLDs per 1000 (age-standardized to the world population in 2002) in developing regions, indicating a higher incidence of disabling conditions as well as increased levels of severity of these conditions. Although the prevalence of disabling conditions, such as dementia and musculoskeletal disease, is higher in countries with long life expectancies, this is offset by lower disability from conditions such as cardiovascular disease, chronic respiratory diseases and long-term sequelae of communicable diseases and nutritional deficiencies. In other words, people living in developing countries not only face lower life expectancies (higher risk of premature death) than those in developed countries, but also live a higher proportion of their lives in poor health.

Healthy life expectancy varies across regions of the world even more than total life expectancy, ranging from a low of 41 years for sub-Saharan Africa to 71.4 years for western Europe, with a global average of 57.7 years in 2002. Healthy life expectancy converts total life expectancy into equivalent years of "full health" by taking into account years lived in less than full health as a result of diseases and injuries. The gap between total life expectancy and healthy life expectancy represents the equivalent lost healthy years resulting from states of less than full health in the population, and ranges from 9% in the European Region and the Western Pacific Region to 15% in Africa. Annex Table 4 contains estimates of healthy life expectancy for all WHO Member States in 2002.

To sum up, this chapter is a reminder that children are among the most vulnerable members of societies around the world. Despite considerable achievements, much still needs to be done, urgently, to avert child deaths from preventable causes. The success stories in many poor countries in all regions demonstrate clearly that much progress can be made with limited resources. Tragically, many other countries, particularly in Africa, have lost the ground gained in previous decades. The gaps in mortality between rich and poor populations are widening, leaving 7% of the world's children and 35% of Africa's children at higher risk of death today than they were 10 years ago.

In the last five decades there have been impressive gains in adult health status worldwide. The average figures, however, mask disparities in population health. Of great concern are the reversals in adult mortality in the 1990s in sub-Saharan Africa caused by HIV/AIDS and in parts of eastern Europe attributable to a number of noncommunicable diseases (particularly cardiovascular and alcohol-related diseases) and injuries.

Demographic trends and health transitions, along with changes in the distribution of risk factors, have accelerated the epidemic of noncommunicable disease in many developing countries. Infectious diseases such as HIV/AIDS and tuberculosis have serious socioeconomic consequences in both the developed and the developing worlds. Thus, the majority of developing countries are facing a double burden from both communicable and noncommunicable diseases. In addition, contrary to common perceptions, disabilities tend to be more prevalent in developing regions, as the disease burden is often skewed towards highly vulnerable subpopulations. The global public health community is now faced with a more complex and diverse pattern of adult disease than previously expected. It has been estimated that 47% of premature deaths and 39% of the total disease burden result from 20 leading risk factors for childhood and adult diseases and injuries and that removal of these risks would increase global healthy life expectancy by 9.3 years, ranging from 4.4 years in industrialized countries of the Western Pacific Region to 16.1 years in parts of sub-Saharan Africa *(16)*.

Historically unprecedented increases in life expectancy at older ages in developed countries have already exceeded earlier predictions of maximum population life expectancy. With such increases, the non-fatal burden of disease plays an increasingly important role, and it will be a major goal of health policy worldwide to ensure that longer life is accompanied by greater health and less disability.

This chapter has described many of the facts of life and death across the world and the underlying trends that influence them. Much of what has been reviewed here relates closely to the health-related Millennium Development Goals. Understanding the goals, and why the progress towards them is so important and at the same time so difficult, is the subject of the next chapter.

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Chapter Two

Millennium Health Goals:

paths to the future

The Millennium Development Goals (MDGs) place health at the heart of development and represent commitments by governments throughout the world to do more to reduce poverty and hunger and to tackle ill-health, gender inequality, lack of education, access to clean water and environmental degradation. Three of the eight goals are directly health-related; all of the others have important indirect effects on health. This chapter traces the origins of the MDGs and tracks the progress so far towards achieving them. It warns that without significantly strengthened commitments from both wealthy and developing countries, the goals will not be met globally.

2
Millennium Health Goals: paths to the future

The Millennium Development Goals (MDGs) adopted by the United Nations in 2000 provide an opportunity for concerted action to improve global health. They place health at the heart of development and establish a novel global compact, linking developed and developing countries through clear, reciprocal obligations.

Seizing the opportunity offered by the MDGs will not be easy. Wealthy countries have so far failed to live up to all of their responsibilities under the compact, which include establishing fairer international trade policies, increasing official development assistance, delivering debt relief and accelerating technology transfer. Despite progress in some cases, many developing countries are not currently on track to achieve their health-related MDG objectives. Without significantly strengthened commitments from both developed and developing countries, the MDGs will not be met globally, and outcomes in some of the poorest countries will remain far below the hoped-for achievements. WHO and international health partners must intensify their cooperation with Member States to speed up progress towards the MDGs and ensure that gains are made by those most in need.

International commitments at the Millennium Summit

In September 2000, representatives from 189 countries, including 147 heads of state, met at the Millennium Summit in New York to adopt the United Nations Millennium Declaration *(1)*. The declaration set out the principles and values that should govern international relations in the 21st century. National leaders made specific commitments in seven areas: peace, security and disarmament; development and poverty eradication; protecting our common environment; human rights, democracy and good governance; protecting the vulnerable; meeting the special needs of Africa; and strengthening the United Nations.

The Road Map *(2)* prepared following the Summit established goals and targets to be reached by 2015 in each of these seven areas. The goals in the area of development and poverty eradication are now widely referred to as the Millennium Development Goals. They represent commitments by governments worldwide to do more to reduce poverty and hunger and to tackle ill-health, gender inequality, lack of education, lack of access to clean water, and environmental degradation. They also include commitments to reduce debt, increase technology transfers and build development partnerships.

A compact to end poverty

The idea of the MDGs as a compact, in which both rich and poor countries have responsibilities, was further developed in early 2002 at the International Conference on Financing for Development, in Monterrey, Mexico. The resultant Monterrey Consensus *(3)* reaffirms the importance of the MDGs and provides a framework for building the partnerships that will be needed to achieve them. A few months later, in September 2002, the World Summit on Sustainable Development, held in Johannesburg, South Africa, took the process a step further by recognizing that poverty reduction and the achievement of the MDGs were central to the overall sustainable development agenda *(4)*. Both the *World development report 2003* and the *Human development report 2003* have further developed the concept of a compact, with a view to informing policy.

The MDGs summarize some of the key commitments made at the major United Nations conferences of the 1990s. They also build on the international development targets prepared by the Organisation for Economic Co-operation and Development (OECD) in 1996 *(5)*. However, it is the two-way nature of the compact that sets the MDGs apart from their predecessors. Developing countries are committed to achieving Goals 1–7. Goal 8 concerns developed countries and the actions that they can take in order to create a more enabling environment in the areas of trade, development assistance, debt, essential medicines and technology transfer. Without progress on Goal 8, it is unlikely that the poorest countries will be able to tackle the structural constraints that keep them in poverty, or sustain the levels of investment required to achieve the other goals.

New concepts of poverty and development

Since the early 1990s, the concepts of poverty and development have evolved away from an exclusive emphasis on income towards a fuller notion of human well-being, as found in the United Nations Development Programme's Human Development Index (HDI) and other multifactorial indices, which provide alternatives to per capita gross national income (GNI) as a measure of development *(6)*.

In this new understanding, poverty means not just low income but the undermining of a whole range of key human capabilities, including health. The term *human poverty* refers to deprivation of the means to achieve capabilities (for example, physical access to health care) and of basic "conversion" factors that facilitate this achievement (such as social access to health care) *(7)*. *Human development* refers to processes that enlarge people's choices to enable them to achieve capabilities (for example, the freedom to choose a healthy lifestyle) *(8)*.

The interaction of health and development

This more complex concept of poverty and development takes account of the interactive processes that are crucial to the social dynamics of health improvement. For example, economic capabilities affect health, as low income constrains access to health care and health-promoting opportunities. Equally significantly, ill-health limits people's ability to earn higher incomes, and contributes to poverty.

The two-way causal relationship between economic development and health has been highlighted by the Commission on Macroeconomics and Health, in order to underline the crucial role of health in economic growth *(9)*. The importance of health within a multidimensional model of sustainable human development is also a key message of the MDGs.

Improvements in health are important in their own right, but better health is also a prerequisite and a major contributor to economic growth and social cohesion. Conversely, improvement in people's access to health technology is a good indicator of the success of other development processes. All of these relationships are evident in the MDGs. Thus, three of the eight goals, eight of the 18 targets required to achieve them, and 18 of the 48 indicators of progress are health-related (see Table 2.1).

The MDGs are interrelated and interdependent. In many countries, it will be impossible to achieve a 50% reduction in income poverty (Goal 1, Target 1) without taking steps to ensure a healthier population. Similarly, eliminating gender disparities (Goal 3) and increasing enrolment rates for primary education (Goal 2) are prerequisites for success in improving health outcomes. Population health can no longer be considered in isolation from questions of the stewardship of natural resources and environmental sustainability (Goal 7). It is therefore important that the health-related MDGs are not seen in isolation – as discrete programmes – but as the result, or desired outcome, of a development agenda with several parts working together.

One of the most challenging goals, to achieve a two-thirds reduction in child mortality (Goal 4, Target 5), requires technical interventions that tackle the major causes of child deaths, such as malnutrition, infections and parasitic diseases. But the effectiveness of these interventions will be mediated through a network of public and private delivery systems, and will depend on adequate levels of financing. Their effect will be reinforced by actions such as those that ensure greater food security and access to education, essential medicines and clean water, and by improved public expenditure management. The ability of governments to finance these efforts will be influenced by both the domestic and international policy and trade environments, and, in poorer countries, by the availability of external financial assistance. The MDGs are consequently a way of assessing and tracking progress in development on a number of critical fronts. They are a shorthand for the *ends*, or outcomes, that governments have committed themselves to achieving, rather than a prescription for the *means* by which those ends are to be achieved.

Progress and prospects

Despite political consensus and the avowed commitment of countries throughout the world, the MDGs will not be achieved at current rates of progress.

The *Human development report 2003* notes that "if global progress continues at the same pace as in the 1990s, only the Millennium Development Goals of halving income poverty and halving the proportion of people without access to safe water stand a realistic chance of being met, thanks mainly to China and India. Sub-Saharan Africa would not reach the goals for poverty until the year 2147 and for child mortality until 2165. And for HIV/AIDS and hunger, trends in the region are worsening". There are some areas where optimism is justified, but the general outlook, in particular for sub-Saharan Africa, is bleak. Even in countries that are making overall progress, gaps in health status between rich and poor may be widening (see Box 2.1).

It is generally agreed that **reducing child mortality** by two-thirds before 2015 is the furthest of all the health-related goals from being realized. Infant and child mortality is the most complex development indicator, as it is considered to include systemic as well as socioeconomic and cultural factors (see Box 2.2). Overall, the Caribbean, central Asia, Europe, Latin America, some countries of the Eastern Mediterranean Region and northern Africa may be

Table 2.1 Health-related Millennium Development Goals, targets and indicators

Goal: 1. Eradicate extreme poverty and hunger

Target: 2. Halve, between 1990 and 2015, the proportion of people who suffer from hunger
- **Indicator:** 4. Prevalence of underweight children under five years of age
- 5. Proportion of population below minimum level of dietary energy consumption[a]

Goal: 4. Reduce child mortality

Target: 5. Reduce by two-thirds, between 1990 and 2015, the under-five mortality rate
- **Indicator:** 13. Under-five mortality rate
- 14. Infant mortality rate
- 15. Proportion of 1-year-old children immunized against measles

Goal: 5. Improve maternal health

Target: 6. Reduce by three-quarters, between 1990 and 2015, the maternal mortality ratio
- **Indicator:** 16. Maternal mortality ratio
- 17. Proportion of births attended by skilled health personnel

Goal: 6. Combat HIV/AIDS, malaria and other diseases

Target: 7. Have halted by 2015 and begun to reverse the spread of HIV/AIDS
- **Indicator:** 18. HIV prevalence among young people aged 15 to 24 years[b]
- 19. Condom use rate of the contraceptive prevalence rate
- 20. Number of children orphaned by HIV/AIDS

Target: 8. Have halted by 2015 and begun to reverse the incidence of malaria and other major diseases
- **Indicator:** 21. Prevalence and death rates associated with malaria
- 22. Proportion of population in malaria-risk areas using effective malaria prevention and treatment measures
- 23. Prevalence and death rates associated with tuberculosis
- 24. Proportion of tuberculosis cases detected and cured under Directly Observed Treatment, Short-course (DOTS)

Goal: 7. Ensure environmental sustainability

Target: 9. Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources
- **Indicator:** 29. Proportion of population using solid fuel

Target: 10. Halve by 2015 the proportion of people without sustainable access to safe drinking-water
- **Indicator:** 30. Proportion of population with sustainable access to an improved water source, urban and rural

Target: 11. By 2020 to have achieved a significant improvement in the lives of at least 100 million slum dwellers
- **Indicator:** 31. Proportion of urban population with access to improved sanitation

Goal: 8. Develop a global partnership for development

Target: 17. In cooperation with pharmaceutical companies, provide access to affordable essential drugs in developing countries
- **Indicator:** 46. Proportion of population with access to affordable essential drugs on a sustainable basis

[a] Health-related indicator reported by FAO only.
[b] Indicators from the MDG list reformulated by WHO and United Nations General Assembly Special Session on HIV/AIDS.

more or less on track, but several countries in each region are not. Some countries of the South-East Asia Region are behind schedule and sub-Saharan Africa, as noted above, is not likely to reach the target until the second half of the next century. If overall trends continue, under-five mortality worldwide will be reduced by approximately one-quarter over the period 1990–2015, which is very far from the goal of a two-thirds reduction. Lack of progress can be attributed to mother-to-child HIV transmission in some parts of Africa, but for most countries the problem is long-standing underinvestment. This applies to efforts both to reduce malnutrition and to achieve full coverage of interventions to reduce mortality from diarrhoea, pneumonia, vaccine-preventable diseases, malaria and perinatal causes.

The **maternal mortality** picture shows a similar divide between, on one side, southern Asia and sub-Saharan Africa, and on the other, the rest of the world. There is a hundred-fold difference in lifetime risk of dying in pregnancy between the world's poorest and richest countries. One of the indicators of progress, the proportion of births attended by skilled personnel, is rising slowly from a very low base in parts of the South-East Asia Region, and stagnating in sub-Saharan Africa. Only a dramatic improvement in the quality and coverage of health services is likely to have a significant influence on progress in relation to this goal (see Box 2.3).

The global **HIV/AIDS** pandemic continues to worsen, with over 70% of all infections occurring in sub-Saharan Africa. Around 40 million people are now living with AIDS, over 5 million new infections occur each year and, in 2002, almost 3 million people died as a result of the disease. Progress is currently measured (for the purposes of tracking Goal 6) by

Box 2.1 Progress towards the Millennium Development Goals – the case of Uganda

Many sub-Saharan African countries are struggling to make progress towards the Millennium Development Goals (MDGs). Nevertheless, some countries in WHO's African Region have registered impressive gains *(10, 11)*.

Uganda, for example, cut poverty sharply in the 1990s and will achieve the MDG poverty reduction target if present trends continue. Specifically pro-poor economic policies may be needed, however, in order to distribute the fruits of economic growth more evenly between rich and poor, especially in rural areas. Furthermore, growth itself needs to be revived through economic diversification. In controlling the spread of HIV, Uganda's progress has actually been more rapid than that required to reach the MDG target (Figure A).

Progress in reducing mortality in children under five years of age has also been substantial. However, it is important to disaggregate the under-5 mortality data in order to understand the impact on different socioeconomic groups. As Figure B indicates, the gap between the richest and poorest sections of the population widened in the mid-1990s. While the richest made gains in line with the MDGs, much less progress was observed for the poorest households. Since the poor make up over a third of Uganda's population, instituting a "bottom-up" approach that focuses on the needs of the lowest quintiles first could achieve the MDG under-5 mortality target ahead of time.

Figure A Current and projected progress towards MDG HIV prevalence target, Uganda

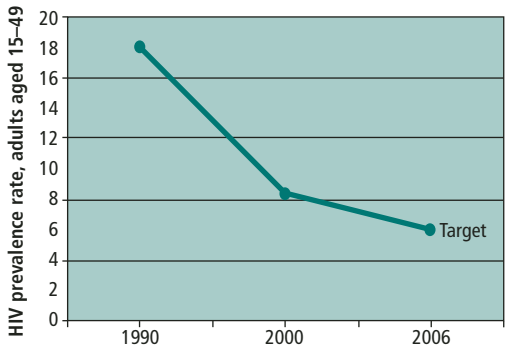
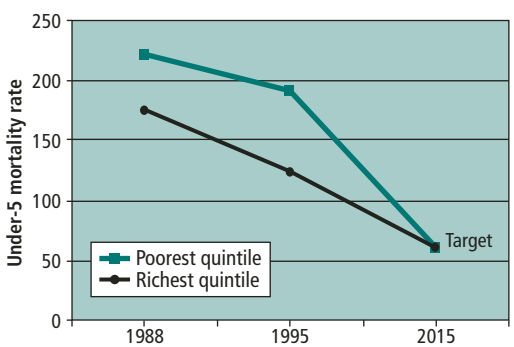


Figure B Rich and poor – unequal progress towards MDG under-5 mortality targets, Uganda



Box 2.2 Child survival – turning knowledge into action

Despite progress in recent decades, globally more than 10 million children still die every year. The number of children and adolescents who died in 2002 was twice the total of adult deaths from AIDS, tuberculosis and malaria combined. All but about 1% of these child deaths occur in developing countries, and more than half are caused by malnutrition, pneumonia, diarrhoea, measles, malaria, and HIV/AIDS. Effective low-cost interventions are available that could prevent at least two-thirds of these deaths. Some interventions are preventive, for example breastfeeding, insecticide-treated materials, complementary feeding, zinc, vitamin A supplements, improved delivery procedures and immunization. Others involve treatment, such as oral rehydration therapy, antibiotics for sepsis and pneumonia, antimalarials and newborn resuscitation. The challenge is to deliver these life-saving interventions to the children who need them most.

Scaling up effective child health interventions will require increased attention to newborn health and the application of an integrated, comprehensive approach to child health at country level.

Although significant progress has been achieved during the past 10 years in reducing mortality in childhood, there has been little progress in reducing deaths among newborns. Almost 4 million infants every year do not survive their first month of life. Most newborn deaths are a consequence of poor health and nutritional status in the mother, absent or low-quality care during pregnancy and delivery, and inadequate basic care of the healthy baby and management of the sick infant. Action to improve the health and survival of newborns and their mothers is urgently needed. High-quality maternity services, including skilled attendants at delivery, can save both newborns and their mothers. Early and exclusive breastfeeding protects newborn lives. A recent meta-analysis has shown that children in Brazil, Pakistan and the Philippines who were not breastfed were 5.8 times more likely to die by the age of one month than children who received at least some breast milk *(12)*. There should be a skilled attendant at every birth, infection control for the newborn, support for exclusive breastfeeding, and identification of complications. If necessary, the infant should be referred urgently to higher levels of health care.

Child health programmes need to move beyond tackling single diseases and instead deal with the child's overall health and well-being. Based on the experiences of Integrated Management of Childhood Illness (IMCI), WHO, together with partners, is developing a simple but comprehensive framework that will guide countries on implementation and scaling-up of effective child health interventions. The framework has five components:

- A situation analysis to assess variables specific to country or context such as burden of child diseases, socioeconomic status, infrastructure, health system capacity, available resources, political stability and predictability for investments.
- Development and formulation of a concise national child health policy with outcome-oriented strategic directions.
- Identification of a set of proven cost-effective child health interventions.
- Scaling-up of interventions through a two-pronged approach: increasing health system efficiency to serve more children, and engaging families and communities more closely in disease prevention and care for sick children.
- Ongoing monitoring designed to inform decision-making at operational level and support countries and partners in measuring progress.

reductions in HIV prevalence among pregnant women aged 15–24 years (where in some African cities it is beginning to decline), by the number of HIV/AIDS orphans (which is forecast to double by 2010), and by increases in condom use in the 15–24-year age group. Some countries could reach the target of reversing the spread of AIDS by 2015, but again, not without an unprecedented increase in the level of effort in the worst affected regions.

Similar prospects overshadow the other health-related targets and indicators – those related to tuberculosis and malaria, improved water sources, improved sanitation, and solid fuel as an indicator of indoor air pollution. While limited progress has been made in some countries, major differences in achievement exist between and within regions and countries. There are major variations in the provision of essential medicines: WHO estimates that 15% of the world's population consumes 91% of the world's production of pharmaceuticals (by value). Overall progress depends on what happens in the world's largest countries, such as China and India. Above all, success in achieving the health-related MDGs requires much more commitment and effort between now and 2015 than has been evident since the countdown started in 1990.

The other side of the compact: Goal 8

Most discussion of the MDGs focuses on Goals 1–7. However, a comprehensive assessment of progress requires an examination of both sides of the compact. Defining indicators for Goal 8 has been difficult. Indeed, there has been a reluctance on the part of some developed

Box 2.3 Fighting maternal mortality – making pregnancy safer

For more than 30 million women each year, pregnancy and childbirth mean unnecessary suffering, ill-health or death. More than half a million women die annually of pregnancy-related complications, 99% of them in developing countries. Yet most maternal deaths and disabilities could be avoided through better-quality health services and good maternal nutrition.

Of all health statistics, those for maternal mortality represent some of the greatest disparities between developing and developed countries. The lifetime risk of dying from maternal causes in sub-Saharan Africa is 1 in 16, compared with 1 in 160 in Latin America and 1 in 4000 in western Europe. In poor countries, as many as 30% of deaths among women of reproductive age (15–49 years) may be caused by pregnancy-related causes, compared with a rate of less than 1% in Australia, Europe, Japan, New Zealand and North America.

Each maternal death is a tragedy. Every year, millions of children are left motherless and an estimated one million children die as a result of the death of their mother. Babies who survive their mother's death seldom reach their first birthday. The risk of death for children under five years of age is doubled if their mother dies in childbirth.

Although the causes of high maternal and perinatal morbidity and ways of preventing and treating them are well known, progress in many countries remains slow. However, some countries – including very poor ones – have been successful in reducing maternal mortality. Maternal and newborn deaths can be significantly reduced by the use of evidence-based maternal health interventions that are reliable, cost-effective and feasible, even in poor settings.

Through its Making Pregnancy Safer initiative, WHO works with countries to achieve their Safe Motherhood goals. The fundamental idea of the initiative is to increase the proportion of pregnancies and births attended by skilled health personnel. For national policy-makers, the most important issues for improving maternal health are:

- Promoting legal reform and community mobilization to enable women to have access to proper care during pregnancy, childbirth and the postpartum period.
- Developing and implementing plans to train and deploy sufficient numbers of skilled health workers, providing them with essential supplies and equipment, and ensuring that they are present in poor and rural communities.
- Ensuring that all women and their newborn babies have access to quality skilled care, including antenatal care; birth care; obstetric emergency care; postpartum care; newborn care; management of abortion complications and post-abortion care; family planning services; adolescent reproductive health education and services; and also safe abortion care, where abortion is legal.
- Ensuring that the coverage and use of maternal health services are monitored, and the findings used to strengthen future activities and improve the quality of care.
- Strengthening research networks and dissemination of critical findings to improve planning and decision-making regarding critical interventions.

countries to endorse the MDGs because of the very existence of Goal 8. Moreover, the commitment by OECD countries to transfer to low-income countries 0.7% of their annual GNP as a contribution to development assistance (agreed since the early 1970s) has been met by only a very few. The average development assistance transfer for OECD countries, as a percentage of GNP, is still extremely low.

Three aspects of the partnership for development are seen by most countries as being particularly important and offering the chance of progress: the World Trade Organization (WTO) round of trade talks at Doha, Qatar, in 2001 (although the September 2003 ministerial conference discussions in Cancun, Mexico, must also be considered), the Monterrey Consensus on development financing, and the Highly Indebted Poor Country (HIPC) Initiative on debt relief. Their importance has both substantive and symbolic elements: substantive because of the influence of trade, debt and development assistance on national economies; and symbolic because of the need to build trust in an increasingly polarized debate between developed and developing countries around roles and responsibilities for development.

Trade

Five issues continue to dominate the trade and development agenda: the Trade-Related Aspects of Intellectual Property Rights (TRIPS) agreement and public health; trade in health services; tariffs and subsidies for agriculture and market access for non-agricultural products; aligning special and differential treatment with national development priorities; and capacity strengthening in least developed countries. The first two issues have an obvious and direct impact on health. The others are equally important, in the light of their impact on the economies of the developing world.

Following the ground-breaking Doha Declaration on the TRIPS Agreement and Public Health in 2001, WTO members reached consensus in August 2003 on implementation of the issue of access to medicines by countries with little or insufficient capacity for pharmaceutical production. The full impact of the agreement will depend on how effectively it can be implemented in countries.

Development assistance

Achievement of the MDGs is unlikely in the absence of a significant increase in development assistance. The most commonly quoted overall figure is an annual increase of US$ 50 billion, roughly double current levels *(3)*. The Commission on Macroeconomics and Health estimate of the requirements for investments, primarily in the health sector, was a total annual figure for development aid of US$ 27 billion – implying at least a four-fold increase in current donor spending on health. Given these estimates, the response has generally been modest, and only a few donor countries have made significant progress towards the 0.7% GNP target. Despite overall trends, however, spending on health and combatting AIDS has increased. Another significant trend is the move towards innovative financing mechanisms, such as the United States Millennium Challenge Account; the Global Fund to Fight AIDS, Tuberculosis and Malaria; and the International Financial Facility proposed by the Government of the United Kingdom.

Debt

More than six years after its launch, it is clear that the HIPC Initiative has had only limited results. By March 2003 only seven countries had reached their completion point, granting them a 90% reduction in the net present value of their debt service from official creditors. In some HIPC countries, even the modest gains from debt relief have been offset by falls in export earnings owing to deteriorating terms of trade. While the arguments continue about the advantages and disadvantages of the various approaches to debt relief, it is evident that a large and ongoing debt burden acts as a significant counterweight to development assistance, and is a major constraint to increases in domestic funding for human development. Moreover, out of 82 countries eligible for the Poverty Reduction and Growth Facility/HIPC/Poverty Reduction Strategy Paper process, only seven have been through the entire process during the last seven years, which may jeopardize the effectiveness of the debt relief initiative to reduce poverty rapidly.

In summary, an overview of progress towards Goal 8 – even in the absence of robust indicators – presents a picture similar to that for Goals 1–7. Much greater efforts are required if the global commitments are to be met. Monitoring issues and progress in relation to Goal 8 need to be placed high on the MDG agenda.

The Millennium Development Goals in practice

While there is little doubt that the MDGs represent an important opportunity for promoting improved health outcomes for poor people, they are the product of a political process and are an imperfect instrument. Several questions and issues have arisen from the practical experience of using the MDGs. Some represent areas in which improvements should be made in the future.

Who owns the MDGs?

National ownership is an important issue. The power and purpose of the MDGs is that they represent a means by which people can hold authorities accountable (for this reason, accessible reports in local languages are a key part of the United Nations strategy). There is a risk, however, that the MDGs are seen by some developing countries as being of primary concern to donors; they may be perceived to be a new form of conditionality and too restrictive in their scope to cover the multifaceted nature of development. The second concern also encompasses the fear that an exclusive focus on the MDGs indicates a rejection of the goals of other United Nations conferences (see the discussion on reproductive health below). Maintaining a genuine political consensus in the face of these fears is a critically important challenge.

How flexible is the approach?

Many countries argue that the targets should be adapted more closely to their level of development, questioning the point of striving towards a goal that has little chance of being achieved. Other countries recognize the value of targets, but want to make them more ambitious or broaden their scope (sometimes referred to as MDG Plus). Some countries argue that it is inappropriate in many parts of the world to concentrate on communicable diseases, given the rapid increases in the effects of noncommunicable diseases, tobacco-caused illness and injuries on the health of poor populations (see Box 2.4). The current health-related goals, targets and indicators of the MDGs only partially reflect the rapid transition of the disease burden in developing countries. There is an increasing call for a set of regional and global goals with timed targets for noncommunicable diseases and their risk factors, neuropsychiatric disorders and injuries.

Clearly there is a need to strike a balance between the need for comparability between countries and the need to ensure relevance (and ownership). If standardized indicators are used, there is no reason, in principle, why countries should not be able to report on their own as well as international targets; as with the MDGs, timed noncommunicable disease targets and practical policies would require focus and commitment by the international health community. WHO will push for a more ambitious and more complete set of global health goals and targets.

Box 2.4 Millennium Development Goals in eastern Europe

Eastern Europe is not usually the main focus of the debate about development in general and the Millennium Development Goals (MDGs) in particular, although a number of eastern European countries now have per capita incomes comparable to those in developing countries in the African and South-East Asia Regions. Much of today's low level of economic development is the result of the substantial drop in output during the decade following the transition to market economies.

Strong national and international commitment is required if eastern Europe is to reach the poverty reduction goal by 2015. Whether this can be achieved depends, among other things, on the degree to which progress towards the other MDGs is achieved and on whether the selected indicators for the other goals match the priority areas for Eastern Europe. There is some evidence to suggest that the latter may not be the case in regard to health-related indicators *(13)*.

In the developing countries of sub-Saharan Africa and the South-East Asia Region the key health problems revolve around issues of child and maternal health as well as infectious diseases, but this is not the case in most eastern European countries, where relatively high adult mortality and noncommunicable diseases account for the largest burden of disease. In the special case of eastern Europe, the use of additional health indicators (such as life expectancy) would therefore be useful.

How pro-equity are the MDGs?

The most serious criticism is that the health-related goals, unlike many of the other MDGs, are expressed in terms of national averages rather than gains among poor or disadvantaged groups. Significant progress in non-poor groups can result in the achievement of goals with only minor improvements in the health status of the poorest *(14)*. The questions then arise: how pro-equity is any progress towards the MDGs? How do lower income groups benefit relative to higher income groups? Different policy choices within the MDG agenda can produce very different social distributions of health benefits. Efforts to reduce under-five mortality in Latin America in the 1990s, for example, distributed gains very differently to the poorest and richest population quintiles in various countries. Guatemala's pro-equity policies led to the greatest decreases in child mortality occurring among the country's poorest people. Other countries, however, saw the under-five mortality situation of the poorest families worsen relative to outcomes among the richest, even as aggregate national averages improved *(11)*. Thus the capacity to disaggregate health data by criteria such as income level becomes crucial to informed policy-making. This requirement must be taken into account in the design of health information systems at country level.

Measuring progress

Although the MDGs and targets were agreed during the political process that forged the Millennium Declaration, the associated indicators were decided on after the event. Many people regard the indicators for the health targets as unsatisfactory. Some indicators include more than one entity to be measured; some are not disaggregated for the population affected by, or vulnerable to, the targeted disease; some are costly to collect; and others have poorly defined numerators or denominators. Some improvement has been made possible by the inclusion of additional indicators, for example on overall healthy life expectancy, to complement disease-specific mortality, but these additions still have only the status of footnotes. There is a reluctance to open up the process to change – at least until a fundamental review has taken place in 2005.

Reproductive health

The International Development Goals that preceded the MDGs made explicit reference to the provision of reproductive health services, based on goals and targets agreed at the International Conference on Population and Development, held in Cairo, Egypt, in 1994 *(15)*. These are not included in the MDGs. Their absence concerns many who fear that the gains achieved in Cairo and at the five-year follow-up (ICPD+5) may be lost. In practice, several key dimensions of reproductive health feature in the MDGs – such as maternal health, child health (including health of the newborn) and HIV/AIDS. Within WHO, in response to a resolution of the World Health Assembly *(16)*, a strategy for accelerating progress towards the attainment of international development goals and targets related to reproductive health is currently being prepared.

Health systems strengthening

The MDGs do not specifically deal with health systems strengthening, and this fact has drawn criticism. It is clear that in many low-income and middle-income countries the health-related MDG targets will not be attained – or, more importantly, sustained – in the absence of significant strengthening of their health systems. Yet the goals highlight core, long-term health

issues for countries, and some of the indicators, on maternal mortality for example, can serve as proxy markers for the efficacy of the health care system as a whole. The MDG concept requires simultaneous progress on a broad front. There is clearly little chance of making simultaneous significant gains in child and maternal health, HIV/AIDS, tuberculosis and malaria, and better access to the right drugs, without adequate investment in health systems.

A concerted effort to tackle health systems constraints on a scale commensurate with the extent of the problem is central to achieving the MDGs and other health goals. The key issues to be confronted are discussed in Chapter 7.

Concurrently, cross-cutting issues that are not directly connected to health care reform are significant for health-related outcomes. These issues include water and sanitation, transport, and the relationship between several of the MDGs and human rights. This relationship – particularly in respect of the poor – has recently received attention from the United Nations Special Rapporteur on the Right to Health *(17)*.

The MDGs and WHO

Defining the place of the MDGs in WHO

The MDGs are assuming increasing strategic importance for many international organizations. For governments and development agencies they provide a focus and a way of both reorienting work and defining parameters for accountability. WHO places great emphasis on support to countries and development partners in their efforts to achieve the health-related MDGs. Some progress has been made, for example, in improving access to essential medicines in countries in each of the six WHO regions (see Box 2.5).

However, this focus on the MDGs does not preclude work on topics or in countries that do not have a direct link to the goals, nor is work on the MDGs confined to those activities of the Organization (such as child health or HIV/AIDS) that are specifically mentioned in one or more goal or target. In this sense, much of the remainder of this report relates to the MDGs. The concept of MDGs represents outcomes, achieved through a wide variety of health actions. But, as has been said about policy development: if it is everything, then it risks being nothing.

Box 2.5 Assuring quality of drugs for HIV/AIDS, tuberculosis and malaria

Before 2001, the United Nations and other procurement agencies lacked a coordinated quality assessment system for HIV/AIDS drugs. As efforts accelerate to scale up access to treatment for people living with HIV/AIDS, and as less expensive generic medicines for low-income countries become more easily available, an agreed process for ensuring that these medicines are of acceptable quality will become the basis for increasing procurement volumes *(18)*.

A pilot system was started by WHO in collaboration with other United Nations organizations (UNICEF, UNFPA and UNAIDS) in March 2001 to assess the compliance of HIV/AIDS drugs with international standards, and thus their suitability for procurement by United Nations agencies. The process involved:

- evaluating product information supplied by manufacturers;
- inspecting manufacturing sites;
- conducting random follow-up quality checks of previously assessed products.

More than 250 product dossiers from different innovator and generic manufacturers have been assessed: an increasing number now meet the norms and standards required by WHO. These changes are reflected in the most recent edition of the list of prequalified products and manufacturers, published and regularly updated on the WHO web site (http://www.who.int/medicines/organization/qsm/activities/pilotproc/pilotprocmain.shtml). This list now includes 50 antiretrovirals (including 22 generics), comprising 44 monocomponent products, 5 double combinations and 1 triple combination. The initiative has also started on prequalification of malaria and tuberculosis medicines and is making considerable progress.

Three principles will guide WHO's work in relation to the MDGs. First, WHO will work with countries to help them develop and work towards a more complete set of health goals that are relevant to their particular circumstances. Second, WHO will give special priority to helping countries develop goals and plans to ensure that deprived groups share fully in progress towards the health-related MDGs (by, for example, ensuring that the percentage improvement in conditions among people below a country's poverty line is at least as large as the percentage improvement in the national average). Third, at the global level, WHO will vigorously advocate that developed countries live up to their part of the compact, especially by acting on those elements of Goal 8 that are of central importance to the MDGs.

In practical terms, WHO will carry out this work as follows:

- **Normative and technical work**. WHO supports national efforts to achieve the MDGs through an extensive body of normative and technical work in the areas of maternal health, child health, HIV/AIDS, tuberculosis, malaria, water and sanitation, access to medicines, health systems, and environmental health, as well as work on health-related developmental issues such as trade, debt, development assistance and human rights. While all of these areas are important, the challenge of making more rapid progress in child and maternal health means that these objectives demand increasing attention.

- **Tracking progress and measuring achievements.** WHO has worked closely with other organizations of the United Nations system to identify indicators associated with each health-related MDG and target. There has also been significant progress in establishing complementary and coherent reporting procedures. The United Nations Development Programme, the United Nations Population Division and the World Bank are using the databases of UNAIDS, the United Nations Children's Fund and WHO as their main sources of health information in relation to the goals. WHO's work on MDG reporting complements other efforts to improve the quality of country health data. It also aims to build capacity in countries to collect, analyse and, most critically, act on information collected. A framework to improve the quality of health statistics has been developed on the basis of five criteria: validity, reliability, cross-population comparability, data audit traceability, and consultation with national authorities. The sources, methods and full development cycle of any published figures have been made more transparent, and explicit data audit trails are now publicly available and open to peer review.

  WHO will report on 17 of the health-related MDG indicators. WHO also monitors core health indicators, as well as indicators for other areas of public health that help explain progress (or lack of it) in the achievement of specific goals at country level. These include immunization coverage for new antigens, prevalence of risk factors for noncommunicable diseases, effectiveness of interventions against these diseases, and impoverishment of households through health payments. WHO is working with partners to develop the Health Metrics Network, which will help strengthen health information systems and thus support the monitoring of MDG indicators (see Chapter 7).

- **Strengthening technical collaboration**. Support in this area will come from all parts of WHO and will be articulated in individual country cooperation strategies. Strengthening WHO's presence in countries is a major priority for the years ahead, and collaboration with countries on meeting MDG targets will be a central thrust of WHO's commitment to help bring measurable health improvements on the ground.

Working with others

WHO is an active supporter of the United Nations core strategy for achieving the MDGs. This strategy has four components: the independent Millennium Project, operational support by the United Nations country teams at country level, millennium reporting, and the Millennium Campaign.

The **Millennium Project** conducts research on, and analysis of, the strategies needed to achieve the MDGs. Over a period of three years, its 10 task forces will work on the operational priorities, organizational means of implementation, and financing necessary to reach the goals. Preliminary work produced by the project has been used in preparing the *Human development report 2003*. A key role of the Millennium Project, as for the Commission on Macroeconomics and Health, will be generating a clear set of messages and making them available to a political audience which may otherwise be unfamiliar with development issues. Recent interaction with project managers suggests that an additional task force should focus on health systems development issues.

Operational support for achieving the MDGs is provided by United Nations country teams. The MDGs have now become an integral part of the instruments – notably the Common Country Assessment and the United Nations Development Assistance Framework – used by United Nations agencies for planning and programming their work. In addition, WHO contributes to the preparation of **national MDG reports** and will work with national authorities to act on their recommendations. Intended for a general audience, the public and local media, the reports focus on progress and constraints and are seen as a means of increasing government accountability. More than 40 have been published so far.

The **Millennium Campaign** aims to raise public awareness of, and political commitment to, the MDGs in both developed and developing countries.

Recognizing the need to keep the health-related MDGs high on the political agenda, the creation of the High-Level Forum on Health, Nutrition and Population Related MDGs has been proposed. The Forum will act as an umbrella body, taking an interest in a wide range of activities that contribute to the achievement of the MDGs. It will provide a structured opportunity for senior officials from donor agencies and national governments to review progress over the whole range of health-related MDGs (but will not itself have any responsibility for monitoring). It will promote lesson learning across countries and regions; it will seek to create links and interaction – particularly between global health partnerships and national poverty reduction strategies; and it will identify opportunities and make recommendations for actions to be taken by others.

Accelerating progress

The MDGs represent a worldwide commitment to reduce poverty and hunger and to tackle ill-health, gender inequality, lack of education, access to clean water and essential medicines, and environmental degradation. Improvements in health are important in their own right as development goals, and are also seen as major contributors to economic growth and poverty reduction.

The MDGs stand apart from previous sets of international development policy objectives. First, they are explicitly interdependent and interrelated: success in achieving one is dependent on efforts to achieve the others. Second, the targets set out under the first seven goals are

one side of a development partnership. Achievements by developing countries depend on enabling actions by the developed world – in trade, development assistance, debt relief and technology transfer – to complete the other half of the compact. These actions are included in Goal 8.

Despite political consensus and commitment, many of the MDGs will not be achieved unless there is a major increase in effort by all stakeholders. Halfway between the base year of 1990 and the target date of 2015, current rates of progress suggest that in sub-Saharan Africa the goal of reducing childhood mortality by two-thirds, for example, will not be reached this century, let alone in the next 12 years. Moreover, even among countries making substantial progress toward the MDGs, aggregate national gains can be deceptive. It is increasingly evident that significant progress in non-poor groups can result in the achievement of goals with only minor changes in the health status of the poorest.

The MDGs are a means by which people can hold authorities accountable. This will be possible, however, only if the goals are accepted as legitimate, and are owned, by all concerned. Developed countries must fulfil their side of the MDG compact, showing that the MDGs are not a control mechanism imposed by donors, but the start of a new international collaboration to foster, more equitably, essential human capabilities.

This chapter and subsequent parts of this report show that there is much that can be done to accelerate progress. It is possible to scale up efforts to confront the AIDS pandemic, to reduce the risk of death in childbirth, to ensure the survival of children and to strengthen the health infrastructure needed for gains toward the MDGs and other health objectives.

Chapter 1 confirmed HIV/AIDS as the leading cause of death among young adults. This chapter has shown how important a part it plays in the MDGs. The next chapter describes how HIV/AIDS has changed the world – sub-Saharan Africa in particular – during the last 20 years, why it now represents a global health emergency, and how it can be brought under control.

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Chapter Three

HIV/AIDS:
confronting a killer

Today HIV/AIDS is a major global health emergency, affecting all regions of the world, causing millions of deaths and suffering to millions more. But access to effective prevention and treatment varies widely. This chapter examines what can and must be done to narrow this gap, and to combat the disease in even the poorest countries. It suggests an aggressive strategy for global action against the HIV/AIDS pandemic that unites the efforts of WHO and its partners from many sectors and effectively combines prevention and care.

3
HIV/AIDS:
confronting a killer

Acquired immunodeficiency syndrome (AIDS) is the leading infectious cause of adult death in the world. Untreated disease caused by the human immunodeficiency virus (HIV) has a case fatality rate that approaches 100%. Not since the bubonic plague of the 14th century has a single pathogen wreaked such havoc. AIDS has torn apart families and caused untold suffering in the most heavily burdened regions. In hard-hit areas, including some of the poorest parts of the world, HIV has reversed gains in life expectancy registered in the last three decades of the 20th century. HIV/AIDS is a major global health emergency.

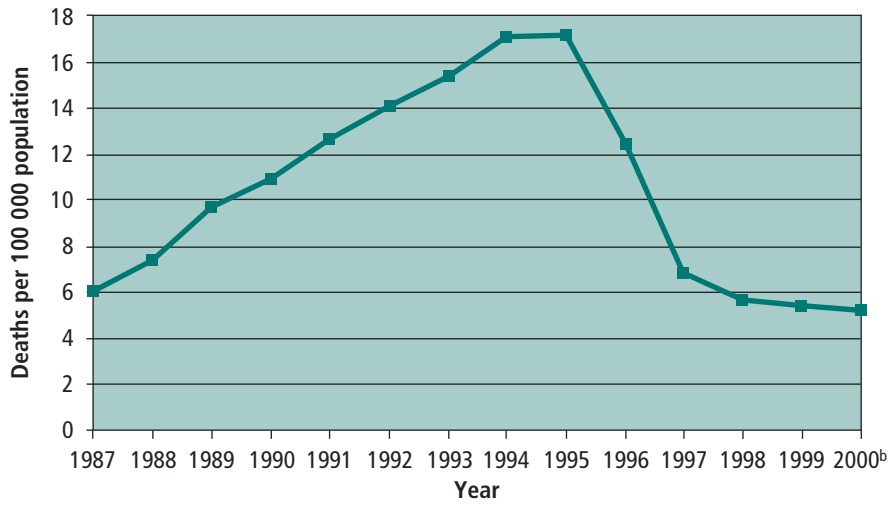
HIV infection also fuels other epidemics of global concern – most notably tuberculosis, which has become a leading cause of death not only among people living with HIV, but also among their HIV-negative family members and contacts. But AIDS is not the same everywhere. Access to effective prevention and treatment, and consequently the fates suffered by individuals infected with HIV, vary widely. People living with HIV but benefiting from the latest medical developments can hope to lead normal lives in many respects: the use of combination chemotherapy with antiretroviral agents (ARVs) renders AIDS a chronic and treatable disease more like diabetes than other serious viral diseases for which there are no effective therapies (see Figure 3.1). In Australia, Europe, Japan and the United States of America, many people with advanced AIDS have resumed their normal lives. In poorer countries, however, and among the poor living in wealthy societies, HIV remains a death sentence. Over the past decade, the "outcome gap" – the different fates of rich and poor – has widened considerably *(1)*.

Why has there been a failure to contain HIV/AIDS? Why have the fruits of modern medicine, including ARVs, not been delivered to those most in need? The answer to these two questions is essentially the same: AIDS is a disease whose impact is much greater where there is poverty and social inequality, including gender inequality. It is not easily managed in settings in which weakened health systems fail to perform, especially for minorities and those living in poverty. HIV/AIDS thus raises urgent human rights issues, especially concerning the right to health care (see Table 3.1).

For all these reasons, HIV/AIDS serves as a report card on current global health status: rising incidence and a growing death toll are rebukes to optimism. It is vital that the global health community makes a bold effort against HIV/AIDS, guided by a commitment to equity in prevention and care.

This chapter reviews important trends in the HIV epidemic and the ways in which effective partnerships can attack both the pandemic and its root causes. It examines successes and failures in the struggle against the world's most devastating infectious disease, before

Figure 3.1 Trends in age-adjusted[a] rate of death from HIV infection, USA, 1987–2000



[a] Using the year 2000 US standard population.
[b] Preliminary mortality data for 2000.

Source: Centers for Disease Control and Prevention.

discussing goals for the coming years. These include narrowing the AIDS outcome gap by providing three million people in developing countries with combination ARV therapy by the end of 2005 (known as the "3 by 5" target). Throughout this discussion, HIV/AIDS care is understood to include treatment with ARVs. Although robust HIV prevention and care constitute a complex health intervention, such interventions are not only feasible in resource-poor settings, but are precisely what is needed.

The HIV/AIDS epidemic: a brief overview

A new disease emerges

AIDS was first described in 1981, when previously healthy young adults – mainly men living in urban areas of the United States – began falling ill with opportunistic infections previously unknown among this age group. Similar infections were soon described in Africa, the Caribbean and Europe; AIDS was clearly an epidemic disease. Most of these young people died, and a host of discrepant hypotheses emerged, but a bloodborne viral pathogen was suspected early on. In 1983, this suspicion was confirmed when Professor Luc Montagnier and others discovered a novel pathogen: a retrovirus tropic for the CD4 cells that orchestrate cell-mediated immunity and protect humans from a broad range of viral, mycobacterial, and fungal pathogens.

Where effective screening was available, transfusion-associated transmission was eliminated, but HIV was not easily stopped. Condoms were shown to be effective in preventing sexual transmission of HIV, but it was not long before those who studied AIDS concluded that male condoms alone would not be enough in settings in which poverty and gender inequality rendered poor women especially vulnerable to HIV infection *(2)*. Women in turn transmitted HIV to their unborn children or to breastfeeding infants. Injecting drug use introduced HIV to previously untouched regions of the former Soviet Union and to parts of Asia. Poor-quality health care – including the reuse of syringes, needles, and other medical paraphernalia – also contributed to the entrenchment of this new epidemic.

The current situation

How well has the international community coped with this new threat to global health? In spite of remarkable scientific achievements – the development of inexpensive diagnostics by the mid-1980s, the sequencing of the entire HIV genome less than 15 years later, and the development of effective antiretroviral therapy by 1995 – the virus has continued to spread (see Figure 3.2). It is estimated that during the course of 2002 some 5 million people became infected with HIV, and almost 3 million people died of AIDS.

Table 3.1 Coverage of adults in developing countries with antiretroviral therapy, by WHO region, December 2002

Region	Number of people	Estimated need	Coverage
Africa	50 000	4 100 000	1%
Americas	196 000	370 000	53%
Europe	7 000	80 000	9%
Eastern Mediterranean	3 000	9 000	29%
South-East Asia and Western Pacific	43 000	1 000 000	4%
All WHO regions	**300 000**	**5 500 000**	**5%**

Everywhere in the world, HIV is transmitted through a fairly limited number of mechanisms. HIV is a bloodborne retrovirus and is transmitted through sexual contact, contaminated blood transfusions, injecting drug use, failure to observe what are now termed in medical circles "universal precautions", and from mother to infant during pregnancy, delivery and breastfeeding.

The most heavily burdened continent is Africa, where the spread of the pandemic has been accelerated by a variety of factors, including widespread poverty, gender inequality, and health systems weakened by pressures such as the large external debt loads of states. Africa is home to more than 70% of those currently infected with HIV. Of all AIDS deaths worldwide – 28 million at the end of 2002 – the majority have also occurred on this continent *(3)*. HIV infection has fanned epidemics of TB in some African countries, increasing the risks to the whole population, regardless of serostatus. Across sub-Saharan Africa, rates of TB have more than trebled, and many conclude that the disease cannot be controlled without aggressive treatment of AIDS *(4)*.

Debates about the relative importance of different modes of HIV transmission in sub-Saharan Africa persist, but the evidence indicates that HIV in this region is primarily a sexually transmitted pathogen *(5)*. Nonetheless, the difficulties involved in following universal precautions in overburdened and under-resourced health care facilities may lie at the root of many AIDS deaths in Africa *(6)*. In many regions, unsafe blood transfusions continue, underscoring the importance of blood safety as a component of effective HIV/AIDS control.

The immensity and rapidity of the spread of HIV have reversed gains in life expectancy in many African countries (see Chapter 1). But the worst may be yet to come. The poorer regions of Asia, including densely populated southern Asia, are the latest areas to be affected by the emerging AIDS epidemic. There has been an alarming rise in HIV/AIDS cases in Asia over the past two decades; the burden of disease and death in the region will be enormous if current epidemiological trends are not slowed or reversed.

Developed countries are also afflicted. The Russian Federation and Ukraine, along with other countries in eastern Europe and countries in central Asia, have the most rapidly expanding HIV epidemics. Here the disease is more closely tied to injecting drug use, which itself is linked to a rapid rise in indices of social inequality *(3)*. Although the absolute number of AIDS cases in the former Soviet Union remains relatively small, the epidemic is expanding rapidly in the Russian Federation and other countries in the region (see Box 3.1). Prison-seated epidemics of TB, including drug-resistant strains, will be further fanned by the rapid rise in HIV incidence already documented among Russian prisoners. Only aggressive

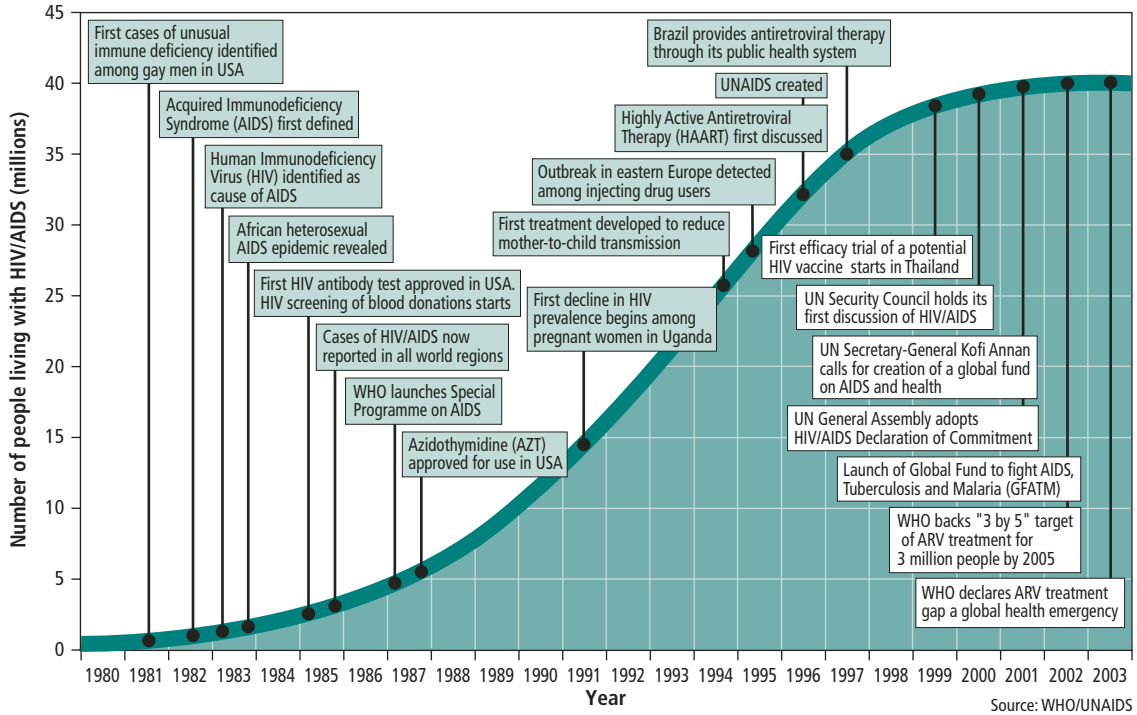
harm-reduction efforts and improved therapy for TB can stem what is a peculiarly modern epidemic of two linked diseases that are now colliding within countries reaching from western Europe to the Pacific Ocean *(7)*.

The true toll of HIV/AIDS

The epidemiology of HIV, including the dynamics of risk, is instructive. But epidemiology tells only part of the story. A disease that has so adversely affected life expectancy will also take a great toll on the social fabric of heavily burdened societies, above and beyond its terrible cost in immediate human suffering. To take two examples, AIDS has orphaned an estimated 14 million African children and will decimate the corps of teachers, health care workers and civil servants in the hardest-hit countries *(8)*.

These social disruptions are manifest in direct economic effects. A recent World Bank study predicts that South Africa will face "complete economic collapse … within three generations" if the country does not take effective measures to combat AIDS *(9)*. But there is much more to the story than can be measured by economists. Other social scientists are broadening the analysis to look at the impact of the disease on an array of events and processes. What, for example, are the social consequences of having millions of AIDS orphans? How does the disappearance of so many parents contribute to the spread of armed conflict and the social pathologies that accompany urban migration and attendant unemployment? What is the cost of the "burnout" registered among health professionals across Africa and in other settings where AIDS therapy is not available to those who need it most *(10)*? Science is only beginning to understand the social and economic toll of HIV/AIDS, which is heaviest in precisely those settings least prepared for a new threat to health and well-being.

Figure 3.2 HIV/AIDS: episodes in an evolving epidemic



Source: WHO/UNAIDS

Responding to HIV/AIDS: lessons from the past 20 years

The first two decades of HIV have disclosed a great deal about how best to prevent and attenuate HIV-related suffering. There are large and small successes to report, but also well-documented defeats with important lessons. There are emerging trends. There are important local variations which render broad generalizations about the global AIDS pandemic extremely hazardous. What can be documented now are a series of interconnected "subepidemics". Each calls for a different set of interventions. Fortunately, the experience gained over the past 20 years offers guidance for those seeking to reverse the trends.

One of the most important lessons of recent years is the need for integrated AIDS prevention and care. Equity in AIDS prevention requires that correct and culturally appropriate information be imparted, along with existing prevention tools, to those most at risk of HIV infection, wherever they live. WHO considers inclusive and equitable prevention a fundamental part of its AIDS work. While there are studies emphasizing the need for constant efforts to promote safer sex and good medical practice, there are no data to support the claim that increased access to AIDS care hampers prevention efforts in the resource-poor settings in which HIV takes its greatest toll. On the contrary, emerging evidence from ARV programmes in resource-poor settings such as central Haiti and Khayelitsha, South Africa, suggests that improving care will serve directly to strengthen prevention in a number of ways. These include: increasing demand for voluntary counselling and testing; reducing stigma and promoting greater openness in discussions of HIV/AIDS in the community; and helping to keep families intact and economically stable, thus slowing the growth of at-risk populations such as orphans and sex workers *(11–15)*.

What accounts for the often stark division between AIDS prevention and care, which in the developing world has meant that, for most people living with HIV, there is simply no decent medical care available at all? That it took 15 years to develop effective antiretroviral therapy for AIDS is regarded as a success by some; for the tens of millions who have died of AIDS, any victory has come too late. But the fact that much was known about HIV and its modes of transmission well before effective therapy became available contributed, in both rich and poor countries, to a separation of HIV prevention and care. In Australia, Europe and the United States, HIV prevention and care are different enterprises conducted by different groups of people *(16)*. HIV prevention does not usually take place in AIDS clinics in wealthy

Box 3.1 HIV/AIDS in the European Region

The European Region is experiencing the fastest growing HIV epidemic in the world, and significant further growth is likely. Between 1995 and 2003, the number of newly reported HIV infections in western Europe doubled to almost 170 000, and in central and eastern Europe grew from 27 000 to 320 000. It is now estimated that at least 1.7 million people in Europe are already infected with HIV.

An epidemic of injecting drug use is fuelling the HIV epidemic. In the former Soviet Union, where two-thirds of all Europeans infected with HIV live, 84% of all HIV cases with a known transmission route are attributable to injecting drug use. In western Europe, sexual transmission is the dominant route, with the largest number of infections among men who have sex with men and among immigrant populations from high prevalence countries.

The HIV/AIDS epidemic has changed dramatically since its onset in the 1980s. Sustainable, long-term, comprehensive and massive response in western Europe, with extensive funding and political support for prevention, treatment and care limited the spread of the epidemic. Widespread prevention measures contributed to stabilizing and decreasing transmission rates, while antiretroviral treatment was also made widely available. In spite of such measures, the HIV/AIDS epidemic remains a serious and ongoing challenge in western Europe. In eastern Europe, limited political commitment and funding, low coverage by prevention services, severely limited access to treatment and care and high levels of stigmatization of groups at risk are the main reasons for a continuously worsening HIV epidemic.

countries. In many poor countries, however, HIV prevention does take place in clinics, although HIV care often does not take place at all.

The results of this separation have been adverse. Although there have been some significant victories, their benefits have been unevenly distributed. Despite striking declines in mortality rates adjusted for age among some people living with AIDS, affluent countries still face ongoing or growing subepidemics. As elsewhere, rates of HIV transmission vary by social standing. In the southern United States, for example, HIV continues disproportionately to affect ethnic minorities in urban conglomerations. Increasingly, poor black people living in rural areas connected by major routes of commerce are also affected. Research conducted in rural North Carolina suggests that the incidence of sexually transmitted infections (STIs) is closely linked to the presence of an interstate highway *(17)*. Similar patterns have also been documented in rural parts of Africa and Asia. Even when local epidemiology differs, social inequalities remain part of the equation for both risk of infection and access to care. In urban areas of the Russian Federation and Ukraine, in contrast to rural southern areas of the United States, a rapidly emerging epidemic is attributable to injecting drug use; among those most affected are the unemployed and, again, members of ethnic minorities.

Integrating HIV prevention and care

Prevention activities need to be designed with the local epidemiology of the disease in mind. In settings in which HIV is largely sexually transmitted, information and education campaigns can save lives. In Thailand, for example, it is estimated that aggressive condom promotion targeting military personnel and sex workers has resulted in significantly fewer new infections than had been predicted *(18)*. In settings in which HIV transmission is linked more closely to injecting drug use, harm-reduction strategies (for example, the provision of clean injecting equipment as well as adequate therapy for drug dependence) have proved to be effective *(19)*. But in every setting studied, the distinction between prevention and care – most marked in the poorest countries, where few of those in need of HIV care ever receive it – has crippled effective response to the disease and also heightened social stigma.

The integration of HIV prevention and care is a recurrent and unifying theme of WHO efforts, in spite of the great diversity of subepidemics. In settings where HIV/AIDS is seen not as a private problem but as a public one, good public policy can prevent new infections, as well as avert death among those already living with HIV. Of course, there is far too much work at hand for there to be no division of labour in prevention and care. Clinicians must ensure that their distinctive skills are used optimally to benefit patients. Activists and community members will make their most important contributions to prevention, support, education and advocacy.

It is difficult categorically to class on-the-ground activities as contributing either to "prevention" or "care" exclusively. For example, most people would class the prevention of mother-to-child transmission (pMTCT) of HIV as a prevention activity. But implementing such programmes has often called for improved prenatal care: "MTCT-Plus" initiatives follow up the initial preventive intervention with ARV treatment for HIV-positive mothers, when clinically indicated, allowing women not only to give birth to healthy babies but also to live to raise them *(20)*. Similarly, improving HIV care helps to destigmatize AIDS. Decreased stigma is associated with increased interest in voluntary counselling and testing, which is a cornerstone of effective HIV prevention and care *(13)*. Some recent studies have begun to catalogue the mechanisms by which increased access to quality HIV care can strengthen prevention efforts *(15)*.

Integrated prevention and care: success stories

Only a few countries have introduced legislation to protect the rights of those living with HIV, including the right to effective therapy. Brazil is one country that has done so successfully. Although social inequalities exist in Brazil, it became one of the first countries in the world to mandate universal and free access to HIV care. In this way, AIDS was transformed from a private problem, one affecting individuals and their families, to a public one. By introducing innovative legislation, Brazil was able to build up Latin America's largest and best-functioning AIDS programme. Widespread access to ARVs may have helped to destigmatize the disease in Brazil and thereby improve demand for voluntary counselling and testing. Although causality is hard to prove, projections made over a decade ago, when it was predicted that Brazil would have a rapidly expanding epidemic, have not come to pass. HIV incidence has declined in recent years now that ARVs are widely available: only 7361 new cases of HIV infection were registered in the first nine months of 2001, compared with 17 504 cases registered in 2000 *(21)*. The Ministry of Health of Brazil estimates that cost savings for reduced hospital admissions and treatment of opportunistic infections between 1997 and 2001 were close to US$ 2.1 billion. The Brazilian experience is not unique. In 2003, Mexico passed legislation similar to Brazil's and may reasonably hope for similar successes *(22)*. Policy can therefore have an indisputable therapeutic effect on HIV/AIDS.

Countries far poorer than Brazil or Mexico have been forced to focus their efforts elsewhere, but can still achieve positive results. In Haiti, the most impoverished country in the Americas, a public–private partnership has introduced culturally appropriate HIV prevention and state-of-the-art HIV care to a population living in dire poverty. One project in Haiti's Central Plateau is a small but mature integrated prevention and care project that first incorporated community-based ARV use in 1998. Because rural Haiti is a setting in which there are very few physicians or nurses, the "HIV Equity Initiative" relies on community health workers called *accompagnateurs* who pay daily visits to patients in their home villages. The *accompagnateurs* (some of whom are themselves living with HIV) are not so much providing directly observed therapy as taking care of their neighbours (see Box 3.2).

The Haiti project has been notable for its clinical and social success – lowered mortality and decreased stigma – but also for its low costs. With the advent of generic ARVs, the HIV Equity Initiative is now being scaled up throughout the forbidding terrain of central Haiti, which is without electricity or paved roads *(23)*. Seroprevalence studies suggest that the Haitian HIV

Box 3.2 *Accompagnateurs*: an example of AIDS care in resource-poor settings

The existence of effective therapy for AIDS has dramatically altered the outcome of HIV infection in certain parts of the world, but such advances are rarely used in precisely those settings most heavily burdened with AIDS. Most HIV-related deaths in the developing world today occur among those who have never received combination chemotherapy with antiretrovirals (ARVs). Reasons offered for this failure have been many, but two are usually given: the high cost of ARVs and the lack of infrastructure required for their use. The first of these objections is under review as generic ARVs become available and as the price of branded pharmaceuticals drops.

The question of missing infrastructure remains. Experience in Haiti and elsewhere suggests that this may be largely a question of personnel rather than laboratory or medical infrastructure. In settings with few physicians and nurses there often exists a large number of underutilized community health workers. In some settings, a number of people, including traditional healers, have expressed an interest in being trained to "accompany" their neighbours living with AIDS. The involvement of these and other community-based workers as *accompagnateurs* will be critical if even modest treatment goals are to be met in the coming years. There is an important precedent in the community-based management of a chronic infectious disease. Tuberculosis programmes reporting the highest cure rates are often those relying on *accompagnateurs* or other community-based providers. The amount of training required is minimal; supervision of *accompagnateurs* may be offered by clinic-based nurses and physicians. If the *accompagnateur* model is adopted widely, patients afflicted with other chronic diseases may hope for high-quality medical care even where there is no doctor *(23)*.

epidemic is contracting rather than growing *(24)*, although the precise impact of HIV/AIDS programmes on the spread of the disease remains to be measured.

Uganda is another extremely poor country that has known declining HIV infection rates. Some have claimed that declining prevalence is the result of an aggressive government campaign to advance prevention messages. The "ABC campaign" is a social marketing effort to promote abstinence, monogamy ("be faithful" is the B in the acronym) and condom use *(25)*. However, declining HIV prevalence in Uganda involves far more than high-level political will and forceful condom promotion, important as these factors are. Developments in Uganda reflect a complex biosocial pattern that includes war, death, migration, and many other events and processes (including, in Kampala and beyond, increased access to ARVs) not necessarily included under the rubric "ABC campaign" (see Figure 3.3). The empowerment of women appears to have been a key factor in enabling safer patterns of sexual behaviour. Civil society groups such as The AIDS Service Organization (TASO) have played a major role. It is also important to note that post-war Uganda, with help from the European Community and other funders, has made significant investments in rebuilding its health care infrastructure *(26)*.

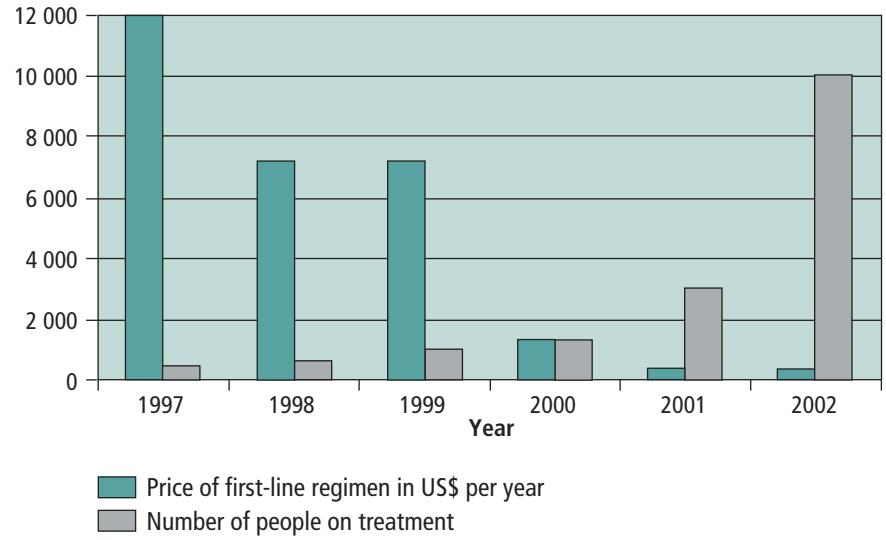
Setting a new agenda

On the basis of the rationale for integrating prevention and care, outlined above, this report suggests an aggressive strategy for global action against the HIV/AIDS pandemic. This agenda will unite the efforts of partners from many sectors.

A human rights approach

Although some people may have become wary of expressions such as "adopting a human rights approach to HIV/AIDS", highly pragmatic steps can be taken to do just that, and these interventions will have a salutary effect on AIDS prevention and care. Social and economic rights, including the right to health care, are central to a future in which HIV will play a less

Figure 3.3 Trends in the cost of ARV drugs and the number of people on treatment, Uganda, 1997–2002



destructive role in people's lives. Governments should take the lead in promoting a human rights model of AIDS prevention and care.

Promotion of the human rights approach to AIDS cannot remain solely the charge of the nation-state, however, especially as poor and beleaguered governments are exhorted to do more and more with less and less.

Civil society organizations, including groups of people living with HIV/AIDS, will continue to play a crucial role in advancing a human-rights-based HIV/AIDS agenda at global, national and local levels. Such groups have been at the forefront of HIV/AIDS prevention, education, and advocacy – not only in wealthy countries, but also in Brazil, Haiti, South Africa, Thailand, Uganda and elsewhere. It is important to ensure that some of the new funding now flowing to HIV/AIDS work through mechanisms such as the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM) and bilateral initiatives is channelled to civil society groups, especially community-based organizations run by and for people living with HIV/AIDS.

Dimensions of good HIV/AIDS control

Although equity is the only acceptable end goal, it is nevertheless true that setting priorities is a key step in the crafting of sound policy. It is possible to identify a number of highly important considerations in implementing projects and national AIDS programmes in resource-poor settings.

Haiti, one of the world's poorest countries, again provides insights. Spiralling, entwined epidemics of TB and HIV and the worst poverty in the Americas did not stop Haiti from putting together a successful application to the GFATM. The proposal submitted to the GFATM called for expanding integrated HIV prevention and care and was linked to the existing national AIDS control plan *(27)*. The Haitian model proposes a stepwise implementation, beginning with improved voluntary counselling and testing and prevention of mother-to-child transmission and then unfolding progressively in several dimensions. The first dimension includes a complete range of prevention services and practices to reduce HIV transmission in all settings. Prevention activities are integrated with improved HIV care for people already infected. Prevention measures include culturally appropriate, community-based HIV education, condom distribution, and voluntary counselling and testing. This component also embraces blood safety and the observance of universal precautions, including safe injection practices.

The second dimension is improved women's health, including access to family planning and safe childbirth. Prevention of HIV transmission from mother to infant will have, as a "windfall benefit", the improvement of women's health in a broader sense. Indeed, it will be easier to meet Millennium Development Goals related to maternal mortality by improving capacity to scale up pilot programmes for the prevention of mother-to-child transmission.

The third dimension of integrated HIV prevention and care is improved TB case-finding and care. This is important in communities heavily burdened by both diseases, since in these settings – most of southern Africa is a case in point – TB is the leading serious opportunistic infection among people living with HIV. Finally, the fourth component of this model is the diagnosis and treatment, preferably through algorithms reflecting local epidemiology, of all STIs. Numerous studies have shown that improving care for STIs will diminish the risk of acquiring HIV *(28–30)*.

Local variation has always been a central factor in the HIV/AIDS story, so the relevance of any pilot projects should be scrutinized. Can such programmes be scaled up district-wide or nationally? Can they be replicated in other heavily burdened and resource-constrained areas?

For example, where injecting drug use is the primary mode of transmission, harm reduction will be central to prevention efforts. There is also a need for greater focus on nutrition as a fundamental component of any approach to caring for people living with HIV/AIDS. But ARVs are, without question, required in all settings. There is very little evidence that different clades of HIV respond differently to combination chemotherapy with ARVs. Preliminary evidence from small pilot projects across Africa, the Americas and Asia suggest that patients with advanced HIV infection will respond well to ARVs, regardless of whether clinical or laboratory criteria are used to assess efficacy.

WHO's work in the HIV/AIDS fight

Attacking inequalities of both risk and access to care is central to WHO's agenda in the HIV/AIDS domain. WHO's expanded role is far larger than that of merely setting standards for effective HIV prevention and care. WHO is working actively with countries and partners towards meeting bold goals in prevention equity and equitable access to care. WHO is unique among these partners in being charged with ensuring equitable access to treatment, and on 22 September 2003, WHO formally declared inadequate access to ARV therapy to be a global health emergency.

Currently, WHO, UNAIDS and their key partners – governments of affected countries, other United Nations agencies, the GFATM, nongovernmental organizations, the private sector and people living with HIV/AIDS – are mobilizing to respond to this treatment emergency. Together, these groups are pledged to deliver antiretroviral treatment to three million people living with HIV/AIDS in developing countries by the end of 2005.

This ambitious "3 by 5" target, first proposed in 2001 *(31)*, will present numerous challenges, but with united action it can be achieved. WHO's HIV/AIDS team, in consultation with other experts, has crafted a global strategy to meet the objective. In declaring lack of access to ARV treatment to be a global health emergency, WHO is fully committed to providing accelerated, intensified support to countries to tackle critical barriers to scale-up. Consistent with the emergency response approach, WHO's HIV/AIDS action agenda includes the following:

- **Emergency response teams** will be provided, if governments request them, to countries with a high burden of HIV/AIDS where the treatment gap most urgently needs to be filled. These teams, with the support and involvement of partners in the United Nations system and nongovernmental organizations, will work with treatment implementers and will conduct a rapid assessment of the barriers and opportunities to achieving the "3 by 5" target.
- **An AIDS drugs and diagnostics facility** will be established to expand patients' access to high-quality, low-cost drugs and commodities. It will assist countries and implementers to navigate drug purchasing and financing while considering best prices and quality. This will help overcome one of the most significant barriers faced by countries and should save time and effort.
- **Simplified treatment guidelines**, published in December 2003, are aimed at making ARVs easier to administer. Achieving the "3 by 5" target requires global standard first-line and second-line treatment regimens.
- **Uniform standards and simplified tools** will be published at the same time to track the progress and full impact of ARV treatment programmes, including surveillance of drug resistance.

- **Emergency expansion of training and capacity development for health professionals** will begin. Health professionals will learn how to deliver simplified, standardized ARV treatment. WHO will support those partners already involved in training, and work with countries to help build a critical mass of highly competent and skilled trainers to expand national capacity for ARV delivery.
- **Advocacy for funding** will involve WHO working with UNAIDS and other partners. Achieving the "3 by 5" target requires not only funding for drugs but a massive investment in training and for strengthening health services in countries. Health systems strengthening will benefit both ARV delivery and the delivery of other health services.

Investing in good HIV prevention and care

In many settings in which HIV/AIDS takes its greatest toll, already lean public programmes have become severely weakened. WHO will provide leadership for the shaping of a very different future, in which social standing is not the chief determinant of access to high-quality AIDS prevention and care. By linking AIDS treatment and prevention, and by linking HIV/AIDS efforts with those designed to deal with other chronic and complex health problems, WHO hopes to document a "multiplier effect": the investments required to implement and scale up integrated AIDS prevention and care will prove to have a salutary impact on many other endeavours in public health and even education. Proper scale-up of pilot treatment efforts will reduce deficits and make up for decades of neglect and, at the same time, strengthen health systems. This windfall benefit of embracing integrated HIV prevention and care will serve the global health community well as it takes on old problems, including the neglected diseases of the poor, and confronts new ones.

An emergency response to a global emergency

The persistence of eradicable diseases, from polio to measles, is a reminder that the global community has failed to bring existing tools to bear on remediable problems. New diseases and challenges, from AIDS and SARS to drug-resistant malaria and TB, show that neglecting public health infrastructure puts all countries and communities at risk. Each of these diseases needs to be reframed as a public problem, in which tackling the causes of individual suffering will generate wider collective benefits.

Simply reconceptualizing AIDS prevention and care will not solve the crisis. Current rates of progress are not adequate to meet objectives such as the "3 by 5" target. Unless the global health community responds now to the need for AIDS treatment in the same way it responds to other emergencies, with exceptional action, the fight against this most powerful enemy will not be won. WHO has committed itself to confronting this global health emergency with urgent measures. The days of a "business as usual" approach to AIDS are over.

Significantly increased resources are needed to tackle pressing public health problems, including HIV/AIDS. Confronting AIDS more boldly will enable a strengthening of primary health care, based on the principles laid out at Alma-Ata in 1978. But achieving this objective will demand greater investment in health from international donors and from countries themselves. Sufficient knowledge and resources exist to prevent the majority of new HIV infections and deaths now occurring. Through better use of existing resources and by bringing new resources to bear on a novel and growing problem, WHO will work in emergency mode in support of countries to redress inequalities of access to proven therapies.

If conducted properly, this emergency response can generate sustained advances. Investing in prevention equity and improved access to care will bring multiple benefits, including a narrowing of the inequalities, both social and medical, that threaten the fragile peace and stability of the global community.

Chapter 3 has shown that although it may be too soon to have a vision of an AIDS-free world, it is not to soon to work towards that future, nor to seek inspiration from the bold initiatives of the past. Fifty years ago, who could have imagined a polio-free world? Yet that reality now seems to be only a few years away. The Global Polio Eradication Initiative is the subject of Chapter 4.

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Chapter Four

Polio Eradication:
the final challenge

As a result of the Global Polio Eradication Initiative, one of the largest public health efforts in history, the number of children paralysed by this devastating disease every year has fallen from over 350 000 in 1988 to as few as 1900 in 2003; the number of endemic countries has fallen from over 125 to seven. This chapter records the final phase of the campaign to eradicate one of the oldest known diseases. The vision of a polio-free world is now within reach.

4
Polio Eradication:
the final challenge

In 1962, just 12 months after Albert Sabin's widely hailed oral polio vaccine (OPV) was licensed in most industrialized countries, Cuba began using the vaccine in a series of nationwide polio campaigns. Shortly thereafter, indigenous wild poliovirus transmission had been interrupted. In other words, no Cuban child would ever again suffer this devastating disease as the result of a Cuban poliovirus. Seldom, if ever, had a new health technology been fully exploited so successfully and so early in its lifespan, to the benefit of so many people. Few countries were to experience such early successes, however, as polio continued to paralyse permanently half a million people every year – even by the 1990s between 10 and 20 million people who had survived the acute illness were living with its debilitating and often painful consequences. For Sabin, however, Cuba's experience with mass campaigns had reaffirmed his conviction that polioviruses could be eradicated so completely that future generations would know polio paralysis only through history books. Sabin's way of shaping that future without polio was to donate his vaccine to the World Health Organization so that it might be made available to all peoples, everywhere.

Forty years later, the world is on the verge of realizing Sabin's global vision of a future without polio. Through an extraordinary 15-year international effort, indigenous polioviruses have now been eliminated from all but seven countries, down from over 125 when the initiative began *(1)* (see Figure 4.1). This progress is the result of a unique partnership forged between governments, international agencies, humanitarian organizations and the private sector to take up three key challenges to reaching all children, everywhere: effective engagement of political leaders, adequate financing, and sufficient human resources. Through this partnership, over 10 million volunteers immunized 575 million children against polio in 93 of the lowest-income countries in the world in the year 2001 alone. This experience, and the prospects for the completion of polio eradication, provide insights for scaling up access to other health interventions, a process that will be essential to achieving ambitious national and international health targets such as those adopted in the Millennium Development Goals *(2)*.

A new kind of partnership

As international interest in a global effort to eradicate polio began to build up 20 years ago, there was limited experience with large-scale international health initiatives and with partnerships. In the mid-1980s, however, as an increasing number of countries in South America – most notably, Brazil – successfully applied the Cuban model of mass campaigns and heightened surveillance to control polio, a new kind of partnership began to emerge with this common purpose.

By 1988, the year in which the World Health Assembly voted to launch a global initiative to eradicate polio *(3)*, four agencies had begun to form the core of the "polio partnership": the World Health Organization, Rotary International, the United Nations Children's Fund (UNICEF) and the United States Centers for Disease Control and Prevention (CDC). Over the following 15 years, the polio partnership has grown to become an extensive network of national governments, international agencies, private corporations, foundations, bilateral donors, humanitarian organizations, nongovernmental organizations and development banks. The work of the partnership continues to be governed by a common, multiyear strategic plan and overseen by international technical committees at the country, regional and global levels. The close relationship between national health authorities and this international partnership was critical to the extremely rapid scaling-up of eradication activities in the mid-1990s, as the initiative began building on the early momentum in the Americas and the Western Pacific Region and extended its activities to all countries of all regions. By the end of the decade, over 500 million children were regularly being reached with OPV through the efforts of 10 million volunteers in every low-income and middle-income country in the world.

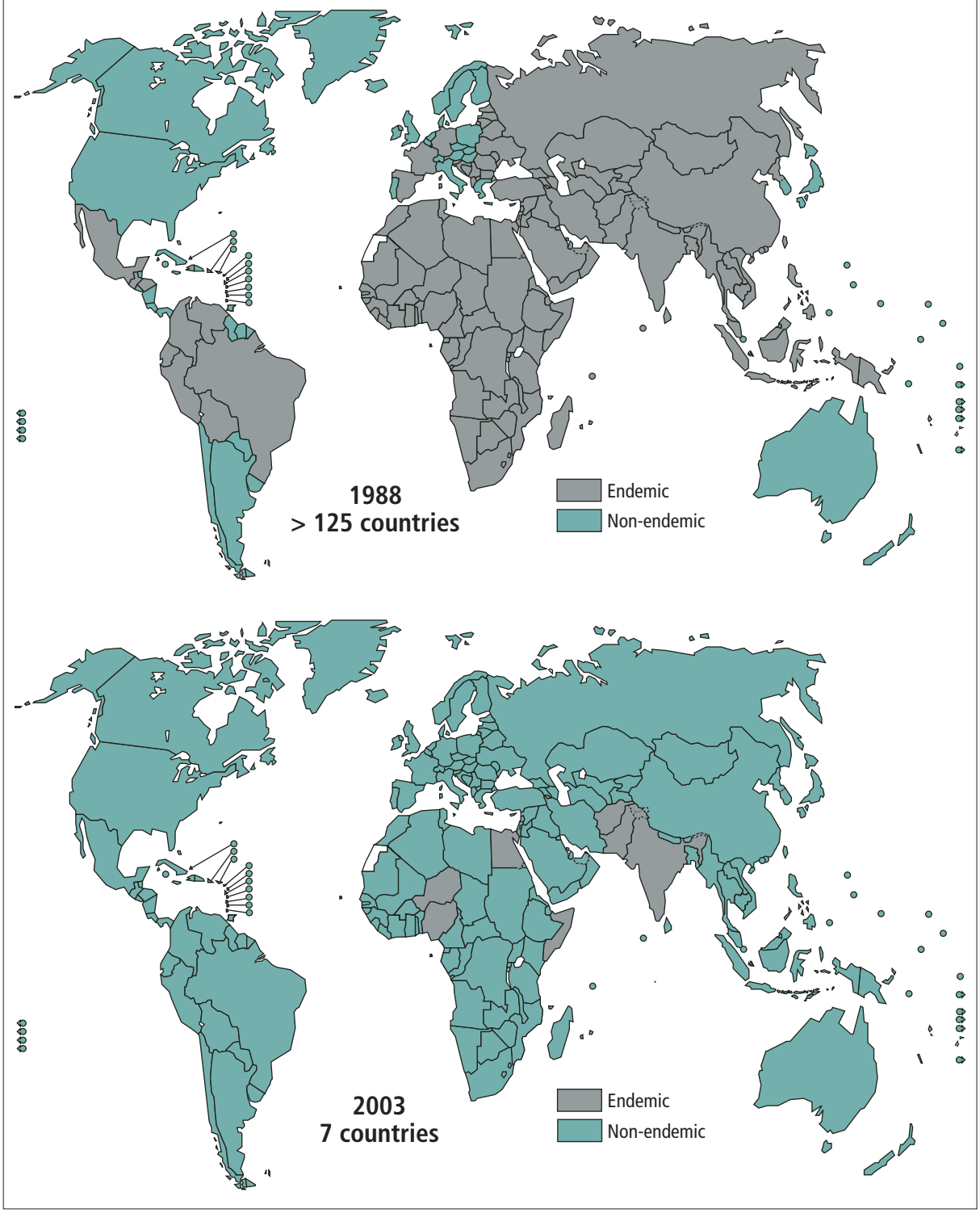
From the outset, this partnership sought to bring a new efficiency to international support for national health efforts. It relied heavily on strategies and management processes that had been established by the Pan American Health Organization (PAHO) in its work to achieve regional elimination of polio. This goal was realized in 1991, when a young Peruvian boy named Luis Fermin Tenorio became the last child ever to be paralysed by a wild poliovirus in the Region of the Americas. The global partnership adopted PAHO's proven four-pronged strategy: high coverage with routine OPV immunization, national polio immunization days, surveillance and laboratory investigation of acute flaccid paralysis (AFP) cases, and massive house-to-house "mop-up" campaigns *(4)*. PAHO's Interagency Coordinating Committee (ICC) mechanism brought together partner inputs at the country level to ensure sufficient resources, while promoting transparent budgeting and efficiencies. The ICCs, convened regularly by national ministries of health, ensured that national authorities were always at the centre of key decisions on strategy implementation. The global partnership also emphasizes engagement at the highest political levels in both donor and endemic countries.

Effectively engaging political leaders

The most visible element of the polio eradication initiative has been the National Immunization Days (NIDs), as they require the immunization of every child under 5 years of age (nearly 20% of a country's population) over a period of 1–3 days, several times a year for a number of years in a row. In many countries, the scale and logistic complexity of these activities were even greater than those of campaigns undertaken during the height of the smallpox eradication effort. Consequently, the commitment of political leaders has been central to their success. This support has been generated by actively and continuously advocating for such leaders to play a role in three key areas: oversight, access to non-health resources, and accountability.

The oversight of polio activities by political leaders has often begun with their personal participation in highly visible events such as the launching of NIDs and, ideally, has continued with their monitoring of progress. Following the example of South America, most countries have had their NIDs launched by the head of state or other prominent political figure. For example, in China, President Jiang Zemin immunized the first child in the national polio campaign in 1993. In the same year, King Sihanouk played a similar role in Cambodia. In 1996, President Nelson Mandela of South Africa launched the "Kick Polio Out of Africa" campaign at the Organization of African Unity (OAU) meeting in Yaoundé, Cameroon, and committed the OAU to regularly monitoring progress *(5)*. Among donor countries, polio has

Figure 4.1 Endemic polio in 1988 and mid-2003



received similar support – most noticeably when the G8 Heads of Government discussed their role in closing the funding gap for eradication activities during their meetings of 2002 and 2003 *(6)*.

This high-level visibility has been critical to achieving the second, and perhaps most important goal of political advocacy: access to government and nongovernmental resources which lie outside the health sector. Because of the huge numbers of people and vehicles that are required to implement NIDs, such activities are beyond the logistic and communication capacity of the health sector in many countries. Consequently, countries have drawn heavily on ministries of information, transport, defence and others to help solve the challenge of rapidly reaching all children, in all corners of a country. Countries have also engaged the private sector, often on an extraordinary scale. In the Philippines, for example, more than 140 private companies have regularly donated personnel, vehicles, facilities and financial support. The effective mobilization of such support has been possible only when the highest political leadership, at both national and subnational levels, endorsed the initiative publicly and took the necessary steps to put these resources at the disposal of health authorities. Thus, the delivery of this health service became a government and societal responsibility, with the responsibility of the health sector moving from implementation to management and monitoring.

This personal engagement of political leaders in the oversight and implementation of activities leads naturally to the third goal of political advocacy: heightened accountability, both

Box 4.1 Progress towards polio eradication in the Eastern Mediterranean

All countries of the Eastern Mediterranean Region are rapidly progressing towards the eradication of poliomyelitis. The number of cases has decreased relatively regularly, as shown by the well-developed and efficient surveillance system. By the end of 2002, poliovirus transmission had been interrupted in 18 countries of the region for more than three years; in addition, Sudan has not reported a single polio case since April 2001. During 2002, 110 confirmed cases of polio were reported from only four countries (Pakistan: 90; Afghanistan: 10; Egypt: 7; and Somalia: 3). During the first eight months of 2003, 61 cases were reported (Pakistan: 57; Afghanistan: 2; and Egypt: 1); a further case, in Lebanon, proved to be imported and genetically linked to the virus strains from India.

Intensified national immunization days (NIDs) are continuing in 2003, with technical support from WHO, both in endemic countries (Afghanistan, Egypt, Pakistan and Somalia) and in Sudan which was recently declared polio-free. All these countries conduct more than two NIDs and one or more rounds of sub-national immunization days (SNIDs) in high-risk districts each year, reaching all children through house-to-house immunization. Acute flaccid paralysis (AFP) surveillance continued to improve throughout the region. The non-polio AFP rate has further increased in 2003 to reach 2.39 per 100 000 children under 15 years of age, while stool specimen collection has reached 90%.

As the polio eradication initiative moves into its final phase, technical advisory groups for the priority countries regularly review the epidemiological situation and national plans and provide technical advice. In addition, a regional technical advisory group was established to provide leadership for eradication activities in the remaining polio-endemic countries and to advise Member States on other technical issues. Increasing attention is being given to the laboratory containment of wild poliovirus, the certification of polio eradication and the development of post-certification immunization policy.

National containment coordinators have been nominated in 19 of the 23 countries of the region, 16 of which have also established national containment committees. By the end of 2002, 18 countries had prepared a national containment plan; three of the remaining five countries still have ongoing virus transmission. The first containment phase has been successfully completed in seven countries and is currently being implemented in another 11.

All countries of the region except Somalia have established National Certification Committees (NCCs) with appropriate membership. Eighteen countries with no viral circulation have submitted reports and national documentation to the Regional Certification Committee (RCC), which has already reviewed 15 of these reports and provided appropriate feedback. The RCC is also reviewing annual updates provided by countries whose initial reports were satisfactory. These annual updates will be submitted annually until regional certification is achieved.

Despite the significant achievements in remaining endemic areas, the eradication programme still faces a number of challenges and constraints that must be overcome to reach the final goal. The main focus now is Pakistan, where several outbreaks occurred during 2002–2003. It seems that the youngest children in tribal and conservative populations are likely to be missed if the vaccination team does not include a woman. In order to overcome these difficulties, the emphasis is on enlisting federal, provincial and local political leaders and expanding the SNIDs to target all transmission zones. New international staff are being mobilized in districts with no previously assigned consultants, to help provide the needed technical support to ensure high-quality performance in surveillance in all areas.

within and outside the health sector. Only the highest-level political leadership has the necessary authority to ensure this accountability, particularly in the non-health ministries whose personnel and resources are so important in ensuring that all children are reached with OPV.

Such high-level engagement of political leaders has brought additional, often extraordinary, benefits. Recognizing that poliovirus knew no borders, in April 1995 leaders of 18 countries of Asia, Europe and the Eastern Mediterranean began coordinating the OPV immunization of 56 million children. Similar activities followed in Africa, where the conflict-affected countries of Angola, the Democratic Republic of the Congo, Gabon, and the Republic of the Congo synchronized three rounds of NIDs from July 2001, reaching 15 million children. Throughout the past 15 years, in countries such as Afghanistan, Angola, Sierra Leone and Sri Lanka, warring parties have laid down their weapons to participate in "days of tranquility" so that their children might be immunized against polio *(7)*. Progress towards eradication in countries of the Eastern Mediterranean and South-East Asia Regions is detailed in Boxes 4.1 and 4.2.

Finding the funds

Sabin's vision of a world without polio required reaching all children with multiple doses of OPV, which in turn required substantial financial resources and in-kind contributions from national and international sources. To mobilize and manage resources on this scale, the polio partnership established a mix of strategies and mechanisms. The success of this approach is reflected in the mobilization of more than US$ 5 billion in funding and in-kind contributions for polio eradication activities, over a 20-year period *(8)*. While the majority of these funds went to time-limited eradication activities, a substantial proportion was directed to the strengthening of routine immunization and surveillance services.

In any given country, the proportion of costs covered by national and international sources has correlated most closely with income level and health system capacity. China, for example, has estimated that over 95% of its costs were borne by the country itself. Even in the poorest countries with virtually non-existent formal health services, such as Somalia, the community absorbs 25–50% of the real costs of implementing polio NIDs through in-kind contributions. Because of the diversity of the communities, governments and partners that have

Box 4.2 Responding to the challenge of polio eradication in South-East Asia

In 2002, the global goal of polio eradication was jeopardized as India suffered the largest outbreak in recent history: 1600 cases were reported that year, a fivefold increase over 2001. As the epidemic spread into Indian states which had finally become polio-free in recent years, the number of infected districts more than doubled from 63 in 2001 to 159. Because of India's long borders with Bangladesh and Nepal, the epidemic also threatened these polio-free countries. By the end of 2002, the South-East Asia Region accounted for 84% of the global polio burden. Since then, however, a massive national and international response has again brought polio to the brink of elimination in the most populous WHO region.

By the end of 2000, 9 of the 10 WHO Member States in the South-East Asia Region and 35 of India's 37 states had interrupted wild poliovirus transmission as part of the global eradication effort. In addition to Bangladesh and Nepal, Myanmar has been polio-free since 2000; Bhutan, the Democratic People's Republic of Korea, Indonesia, Maldives, Sri Lanka and Thailand all stopped indigenous transmission prior to 1999. This progress is the result of a regionally coordinated, data-driven programme that began in the early 1990s and through which National Immunization Days have reached over 200 million children, often synchronized across Member States and supported by regional bodies such as the South Asian Association for Regional Cooperation. Strong polio surveillance and a regional network of 17 high-quality laboratories have guided the effort and confirmed these achievements.

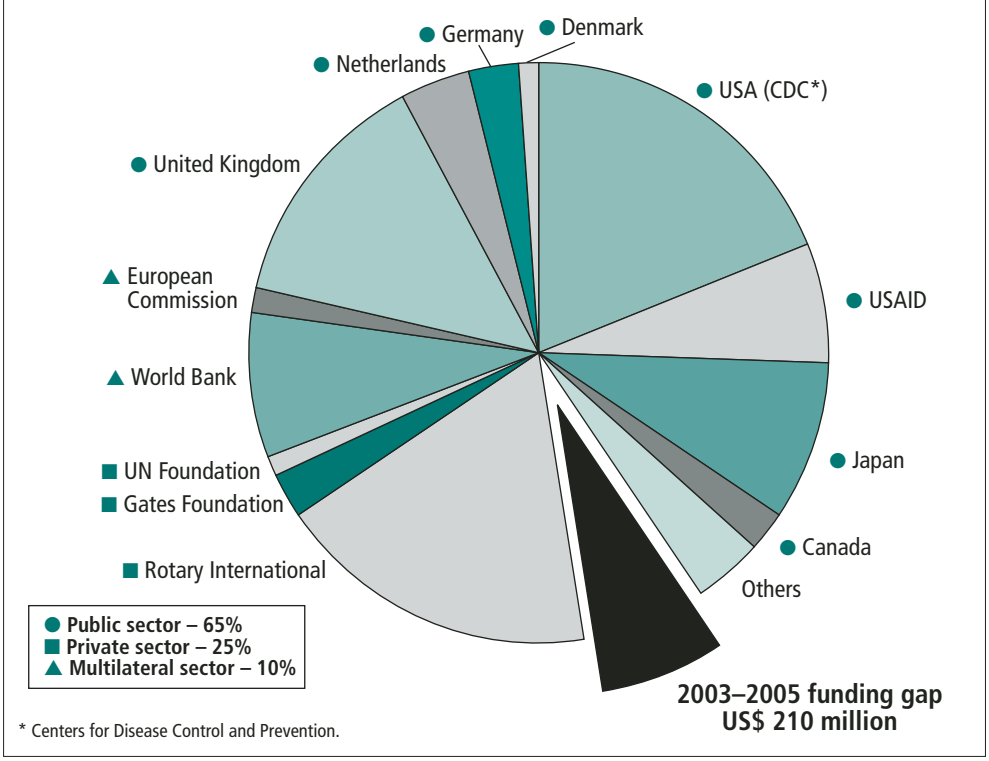
Investigations into the 2002 epidemic demonstrated that a combination of low routine immunization coverage and an insufficient scale, number and quality of polio campaigns had led to a rapid accumulation of susceptible children, especially in the state of Uttar Pradesh. In response, political oversight of the programme was markedly increased, the number of polio campaigns was raised to six per year, and additional efforts were made to reach children in minority populations. Consequently, by the end of September 2003, polio was at its lowest level in history (132 cases) and there was again the real possibility of forever eliminating this devastating disease from South-East Asia by 2005.

contributed to the implementation of polio activities, it is impossible to quantify accurately the value of all financial and in-kind expenditures. Of the over US$ 5 billion that will have been spent on the initiative, however, a conservative estimate based on the time of volunteers and health workers during NIDs – the most labour-intensive of the strategies – suggests that polio-endemic countries will have contributed at least US$ 2.35 billion in volunteer time alone between 1988 and 2005 *(8)*. Additional public and private sector resources from the national, state, province, district and local community levels paid for petrol, social mobilization, training and other costs.

External sources will have provided at least US$ 3 billion to help endemic countries cover polio eradication costs. Of the more than 100 external donors to date, 26 will have contributed more than US$ 1 million over the lifespan of the initiative and 12 at least US$ 25 million (see Figure 4.2). A particular strength of the polio initiative has been its strong partnership with a number of non-traditional donors of development aid, most notably Rotary International (see Box 4.3). The country-level budgeting and resource management processes, combined with centralized tracking of resource requirements and funding flows, have allowed the programme to accommodate the needs of donors and recipient countries while improving the efficient use of available financing. Despite their limited infrastructure, many low-income and lower-middle-income countries have clearly demonstrated a tremendous absorptive capacity for health resources, which can rapidly achieve real health outcomes.

Although the coordinated international advocacy and resource management of this initiative have been very successful, the most striking aspect of the financing for polio eradication has been the substantial contribution of endemic countries and communities themselves to ensuring that their children share fully in the global vision of a world without polio.

Figure 4.2 Global Polio Eradication Initiative: financial support 1988–2005



* Centers for Disease Control and Prevention.

Finding the people

While strong political engagement and substantial financial and in-kind resources are essential to the success of the polio initiative, they are not sufficient. These two elements have had to be complemented with sufficient people to implement the eradication strategies in every corner of the world. Although high-income and higher-middle-income countries could usually rely on strong health services to implement the eradication strategies, a massive gap in the critical area of human resources for health, particularly in low-income and lower-middle-income countries with the greatest polio burden, threatened the success of the entire global effort.

The number, mix and distribution of people required to eliminate polio from countries differed, depending on the strategy. The most labour-intensive strategies were the massive, time-limited, supplementary immunization activities such as NIDs and "mop-up" campaigns. The most skill-intensive strategy was that involving continuous disease surveillance and laboratory activities. In general, the very different human resource requirements of the two types of strategy were met through different approaches.

The number of people required to implement NIDs is tremendous. As noted above, an estimated 10 million volunteers and health workers immunized 575 million children during such polio eradication activities in 2001. Two key aspects of NIDs were critical to resolving the gap between existing, trained vaccinators in a country and the number needed for NIDs. First, because NIDs only require administering 2 OPV drops to a child and then recording the number immunized, with 1–2 hours of training community volunteers could safely deliver the service. Second, the time-limited nature of NIDs meant that volunteers were willing to participate and that other government ministries, nongovernmental organizations and private sector partners could bear the opportunity costs incurred by having their staff participate. Consequently, the major challenge for national and subnational health authorities and the polio partnership became the mobilization, training, equipping and management of these human resources. Given the scale of this mass mobilization, a substantial effort was made to include other interventions in NIDs where feasible and safe: it has been estimated that the inclusion of vitamin A supplementation in polio NIDs averted 1.25 million childhood deaths *(9)*.

The high-quality surveillance required for guiding supplementary immunization activities and monitoring their impact called for a different human resources response. Far fewer people were required than for NIDs, but with a much higher level of skills to identify, notify,

Box 4.3 A public–private partnership for polio eradication

Rotary International is one of the four spearheading partners of the Global Polio Eradication Initiative, having endorsed the concept of a global effort even before the World Health Assembly resolution of 1988. In 1985, Rotary pledged its commitment to the international health goal of a "polio-free world" by the time of its centenary in 2005.

In endemic areas, Rotarians – from more than 160 countries – have volunteered their time to help ministries of health with every aspect of the programme, including polio vaccine delivery, health worker transport, provision of critical equipment, and community mobilization. In polio-free countries, Rotarians have continuously raised the profile and importance of polio eradication through advocacy and public information campaigns.

Rotary International has provided financial support to polio eradication on an unprecedented scale. By 2005, Rotary's direct financing will have reached over US$ 500 million since 1988, 20% of the total external financing for the entire initiative. In addition, Rotary has been at the centre of the multi-agency advocacy effort that has mobilized US$ 2.4 million in further external funding from donor governments, foundations, development banks and the private sector.

Rotary International has campaigned with key political leaders of both endemic and polio-free countries to ensure their active participation in the programme. This regular, high-level advocacy by a private sector partner has kept polio eradication high on the global agenda, despite many competing priorities

investigate and respond to cases of AFP *(4)*. Furthermore, they had to be available on an ongoing basis. Consequently, the polio partnership focused on working with national authorities to expand and strengthen the existing national surveillance infrastructure wherever possible. Where this infrastructure was functionally non-existent, partners worked with national authorities to establish AFP surveillance. In any particular country, the strategy pursued to close this human resources gap depended on the broader national strategy for strengthening health services. In some countries, surveillance personnel received government salaries with operating costs, including vehicles and equipment, covered by international sources. In other countries, national salaries were supplemented by partners as part of a government strategy to retain highly qualified staff. In still others, WHO and governments established and operated a joint surveillance programme. In addition, WHO hired and deployed nearly 1500 national and international staff to provide technical assistance and even conduct surveillance activities in those areas with the weakest capacity.

Through this mix of strategies and approaches to the gap in human resources for health, it has been possible to reach almost every child in the world with OPV and other interventions (such as Vitamin A supplementation), irrespective of socioeconomic status, religion, minority status, geography or even war. In addition, a truly global surveillance and laboratory capacity now exists to identify and respond rapidly to polio, as well as to many other diseases of public health importance such as measles, neonatal tetanus, meningitis, cholera and yellow fever, depending on the country *(10)*. In the Western Pacific Region, this capacity contributed to the international response to the SARS outbreaks of 2002–2003.

Prospects for a polio-free future

As the result of an aggressive, deliberate and internationally coordinated effort, polio has changed from being a devastating disease with a global distribution to one that is now geographically restricted to seven countries. To capitalize on this progress, substantial effort is now required to interrupt the final chains of polio transmission, certify that achievement, and minimize the risk of polio being reintroduced in the future. The polio partnership's Polio Eradication Strategic Plan 2004–2008 summarizes these challenges in its major objectives.

First, the final chains of poliovirus transmission must be interrupted in the remaining seven countries. Particular effort will be required in India, Nigeria and Pakistan, which now account for 99% of the world's polio burden and remain a source of importation to polio-free areas. Within these countries, five of the 76 states or provinces are the key to global eradication; with sustained high-level political engagement, oversight and accountability in each one, high-quality NIDs could rapidly reach all children and halt polio transmission within 12 months.

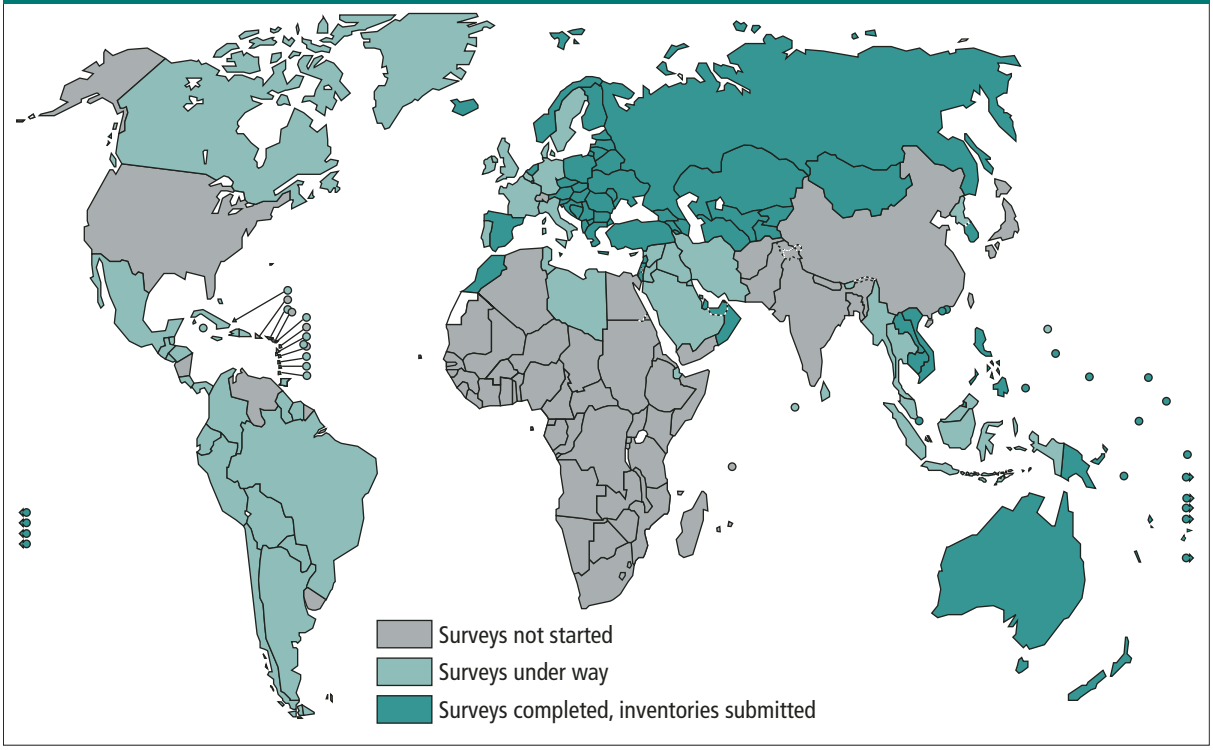
Second, the global interruption of wild poliovirus transmission must be verified by the Global Commission for the Certification of Poliomyelitis Eradication. Certification requires that all countries provide documentation demonstrating the absence of wild poliovirus circulation for at least three years, in the presence of high-quality surveillance, as well as the "containment" of all stocks of wild poliovirus. Containment requires that within one year of the interruption of wild poliovirus transmission globally, countries will have identified all stocks of wild poliovirus and ensured their storage and handling under appropriate biosafety conditions (see Figure 4.3).

Third, appropriate policies will need to be developed, and internationally agreed, for the post-certification era. These policies must be designed to both minimize the risk of reintroduction of wild poliovirus and ensure the global capacity to manage such an event should it occur. Consequently, policies will be needed in four areas: polio detection and notification, long-term biocontainment of *all* poliovirus strains (that is, wild and vaccine strains), polio vaccine stockpiles, and routine immunization *(11)*. The development of these policies will be even more complex than it was for smallpox, for a number of reasons. For example, the very low risk of vaccine-derived polioviruses regaining the capacity to cause outbreaks is now well documented. Furthermore, the risks of international terrorism have substantially affected the willingness of some policy-makers to plan for the discontinuation of routine polio immunization in the near future, regardless of the economic benefits. Because of the complexity of these issues, ongoing research in this area will be complemented by broad consultation with governments and stakeholders through the World Health Assembly and other forums from 2004 onwards *(11)*.

Scaling up the delivery of health services

The greatest success of the polio eradication initiative to date has been its capacity to reach virtually every population in the world with a basic health service, regardless of geography, religion, conflict or even the strength of the health system. This experience in scaling up to implement fully the eradication strategies is now one of the most valuable assets of the programme. Perhaps the most frequent, if unfair, criticism of the highly regarded smallpox eradication effort was that it left little infrastructure behind to tackle other diseases. Indeed, the ultimate legacy of the polio eradication initiative will depend largely on the extent to which the experience and lessons learnt are used in scaling up the delivery of other health services.

Figure 4.3 Global action plan for laboratory containment of wild polioviruses, February 2003



Although political engagement, partnership management and financing were essential components of the scale-up, these approaches alone were not sufficient in areas with particularly weak health systems. In such areas it was only possible to achieve scale-up after other fundamental gaps in the health system had been tackled. At the central level, joint national and international technical advisory bodies, established at either the regional or national level, helped strengthen and support policy-making functions. Substantial international technical assistance then helped build national capacity to translate these policies into local guidelines and procedures, while assisting national bureaucracies to "jump start" their implementation. At the sub-national level, national staff were trained or hired to perform these functions. In general, a very pragmatic approach was taken to ensure appropriate remuneration for the work that was conducted. Great emphasis was placed on establishing national capacity to monitor and evaluate strategy implementation effectively at each level, using standard and robust performance indicators for every aspect of the programme, from the collection of stool specimens from suspect cases to the cost per child immunized.

At the level of service delivery, the major challenges related to creating and then meeting demand for immunization with OPV. Demand creation was usually a major issue only in urban areas; in rural settings, the simple availability of the service was often sufficient to create the necessary demand, and this is likely to be the case for other pressing needs such as HIV treatment. Consequently, social mobilization was the principal service delivery challenge in the urban setting while logistics were far more important in rural areas. Mobilizing communities in urban areas required a heavy reliance on radio and television, with carefully tested messages delivered by appropriate spokespeople. In the rural setting, the systematic identification and engagement of traditional and community leaders was the essential foundation for the person-to-person communications that were needed. The logistic demands of actually delivering OPV in urban areas could frequently be met through the formal health services, supplemented by paramedical personnel or students. In the rural setting, gaps in the formal health service required community volunteers for every element of the programme from the collection of vaccine from depots through to immunization, tallying and reporting.

While the importance of all of these elements is widely and well recognized, the strength of the eradication initiative has been in its ability to deal sufficiently with these matters at the international, national and peripheral levels at the same time. This was only possible, however, by deploying substantial numbers of technical and support staff in areas where the formal health systems were weakest; the number of these staff reached nearly 3000 by the year 2001, with 80% in just 15 countries.

Many of the newer international disease control initiatives, such as those targeting other vaccine-preventable diseases, AIDS, tuberculosis and malaria, must deliver more complex interventions than OPV. Nonetheless, the lessons learnt through polio eradication in filling gaps in the health system are also applicable to scaling up the delivery of such services. For example, the success of these newer initiatives will also require the active participation of communities on a massive scale to close the gap caused by insufficient numbers or distribution of trained health workers. Optimizing the engagement of volunteers – whether to deliver bednets, conduct HIV education, or distribute drugs and ensure their consumption – will also require supply lines that can provide every community with the necessary tools on a predictable, if intermittent, basis.

Optimizing the potential benefits of the polio eradication infrastructure, experience and lessons will require strengthening linkages with newer programmes to scale up access to these important health interventions. WHO is firmly committed to strengthening these links for

the benefit of all peoples everywhere and being as bold with the new interventions as Cuba was in rapidly scaling up the use of OPV.

Progress in eradicating this debilitating disease clearly demonstrates that national governments, backed by strong international partnerships, can generate and manage the political leadership, financing, and human resources needed to reach all populations with health interventions. The ultimate success of the polio eradication effort, however, is still not guaranteed; it now rests with the leaders of a very small number of endemic areas, who must ensure that all of their children are immunized, and the leaders of wealthy countries, who must act on their verbal pledges to close the chronic financing gap for these activities. In meeting these challenges, the world will create a global public good for health whose benefits will accrue to all children, potentially for ever.

This chapter has chronicled the long and difficult war against one of the world's oldest diseases. Chapter 5 is the story of the brief but deadly encounter with one of the world's newest threats, SARS – how a vital victory was achieved, and the lessons it offers for the future.

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Chapter Five

SARS:
lessons from a new disease

New diseases have been emerging at the unprecedented rate of one a year for the last two decades, and this trend is certain to continue. The sudden and deadly arrival of SARS on the global health stage early in 2003 was in some ways perhaps the most dramatic of all. Its rapid containment is one of the biggest success stories in public health in recent years. But how much of that success was a result of good fortune as well as good science? How narrow was the escape from an international health disaster? What tipped the scales? The international response to SARS will shape future strategies against infectious epidemics.

5
SARS: lessons from a new disease

The day-by-day struggle to control the outbreak of severe acute respiratory syndrome (SARS) represents a major victory for public health collaboration. Key lessons emerge that will be invaluable in shaping the future of infectious disease control – and being ready for the day when the next new disease arrives without warning. First and most important is the need to report, promptly and openly, cases of any disease with the potential for international spread in a closely interconnected and highly mobile world. Second, timely global alerts can prevent imported cases from igniting big outbreaks in new areas. Third, travel recommendations, including screening measures at airports, help to contain the international spread of an emerging infection. Fourth, the world's best scientists, clinicians and public health experts, aided by electronic communications, can collaborate to generate rapidly the scientific basis for control measures. Fifth, weaknesses in health systems play a key role in permitting emerging infections to spread. Sixth, an outbreak can be contained even without a curative drug or a vaccine if existing interventions are tailored to the circumstances and backed by political commitment. Finally, risk communication about new and emerging infections is a great challenge, and it is vital to ensure that the most accurate information is successfully and unambiguously communicated to the public. WHO is applying these lessons across the Organization as it scales up its response to the HIV/AIDS emergency.

The first cases

On 12 March 2003, WHO alerted the world to the appearance of a severe respiratory illness of undetermined cause that was rapidly spreading among hospital staff in Hong Kong Special Administrative Region (China) and Viet Nam. Within two days, it was clear that the illness was also spreading internationally along major airline routes when hospitals in Singapore and Toronto, Canada, reported seeing patients with similar signs and symptoms. The potential for further international spread by air travel was vividly illustrated on 15 March. In the early hours of the morning, the head of WHO's outbreak alert and response operations was woken by a call from health authorities in Singapore. A doctor who had treated the first cases of atypical pneumonia there had reported having similar symptoms shortly before boarding an international flight returning to Singapore from New York. Asked to intervene, WHO alerted the airline and health authorities in Germany, where the flight was scheduled for a stopover. The doctor and his wife disembarked in Frankfurt and were immediately hospitalized in isolation, becoming the first two cases in Europe. Because of these events, WHO issued a second, stronger alert later in the day. It set out a case definition, provided advice to

international travellers should they develop similar symptoms, and gave the new disease its name: severe acute respiratory syndrome (SARS). The global outbreak of SARS became the focus of intense international concern, and it remained so for almost four months.

Origins and international spread

SARS is a newly identified human infection caused by a coronavirus unlike any other known human or animal virus in its family. Analysis of epidemiological information from the various outbreak sites is still under way, but the overall case fatality ratio, with the fate of most cases now known, approaches 11%, but with much higher rates among elderly people. Transmission occurs mainly from person to person during face-to-face exposure to infected respiratory droplets expelled during coughing or sneezing, or following contact with body fluids during certain medical interventions. Contamination of the environment, arising from faecal shedding of the virus, is thought to play a small role in disease transmission, illustrated by the almost simultaneous infection in late March of more than 300 residents of a housing estate in Hong Kong where faulty sewage disposal was identified. At present, the disease has no vaccine, no curative treatment, and no reliable point-of-care diagnostic test, though antibody tests have been developed that can reliably confirm previous infection using acute and convalescent sera. Management of SARS is supportive, and control strategies rely on standard epidemiological interventions: identification of those fitting the case definition, isolation, infection control, contact tracing, active surveillance of contacts, and evidence-based recommendations for international travellers. Though demanding and socially disruptive, particularly when large numbers of people were placed in quarantine, these standard interventions, supported by high-level political commitment, proved sufficiently powerful to contain the global outbreak less than four months after the initial alert.

The earliest cases of SARS are now thought to have emerged in mid-November 2002 in the southern Chinese province of Guangdong. Retrospective analysis of patient records, to date incomplete, has identified small clusters of cases, each traced to a different initial case, that occurred independently in at least seven municipalities, with the first case recorded on 16 November 2002 in Foshan City and the largest number of cases concentrated in Guangzhou City. Analysis has uncovered no links among the various initial cases in the clusters. Some cases with no previous known history of exposure also occurred *(1, 2)*. Early collaborative studies conducted in Guangdong have detected a virus almost identical to the SARS coronavirus in domesticated game animals – the masked palm civet cat and the raccoon dog – sold in Guangdong live markets, suggesting that these animals might play a role in transmission of the virus to humans.

The initial phase of the Guangdong outbreak, characterized by small, independent clusters and sporadic cases, was subsequently followed by a sharp rise in cases during the first week of February 2003, thought to result from amplification during care in hospitals. Cases gradually declined thereafter. Altogether, some 1512 clinically confirmed cases occurred in the Guangdong outbreak, with health care workers in urban hospitals accounting for up to 27% of cases *(1–3)*. This pattern – occurrence in urban areas, with most cases concentrated in hospitals, and amplification during care – was repeated as the disease began to spread outside Guangdong Province to other areas in China and then internationally.

The first recorded case of SARS outside China occurred on 21 February 2003, when a medical doctor who had treated patients in Guangzhou City and was himself suffering from respiratory symptoms spent a single night in a hotel in Hong Kong. Through presumed contact, the mechanism of which is not fully understood, he transmitted SARS to at least 16 other guests

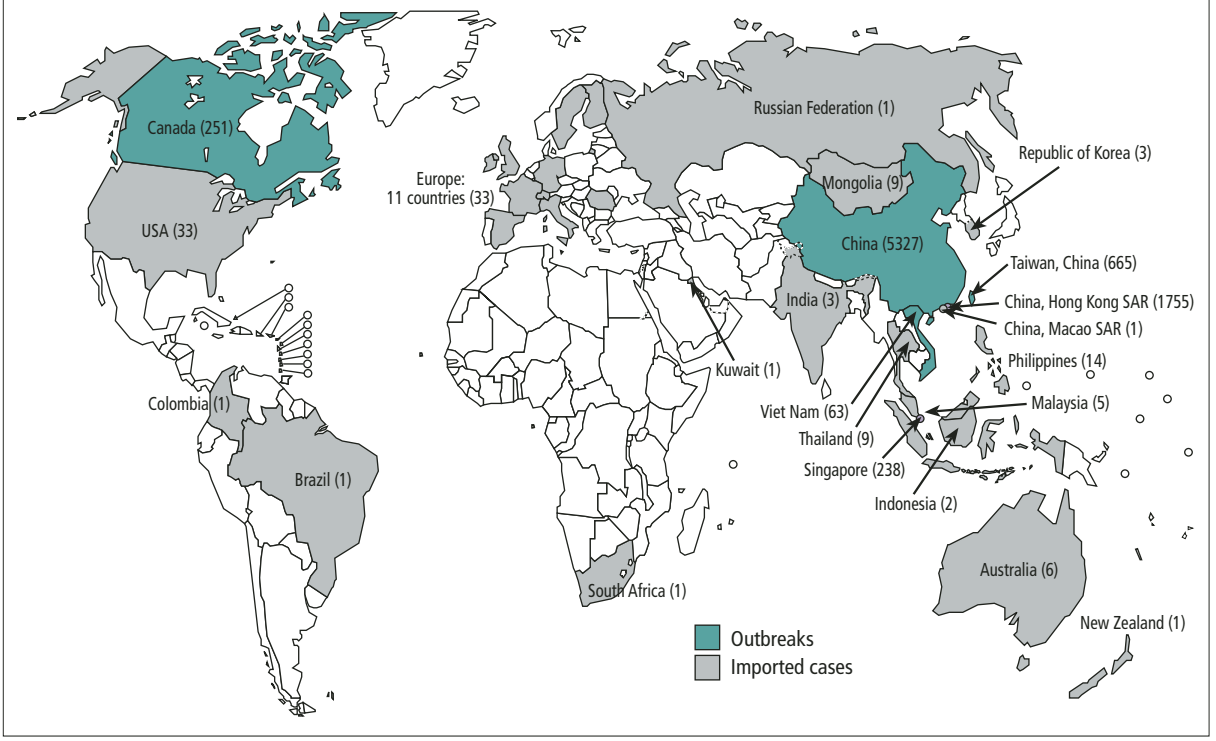
and visitors, all linked to the same hotel floor. They carried the virus with them as they entered local hospitals or travelled on to Singapore, Toronto and Viet Nam. An international outbreak that eventually spread to 30 countries had thus been seeded. Figure 5.1 maps the distribution of 8422 cases and 916 deaths that had occurred by 7 August 2003.

Detection and response

On 15 March 2003, when the second alert was made, the cause of SARS had not yet been identified. Cases were concentrated in hospital workers and did not respond to medicines known to be effective against a number of different lung infections. Many patients were rapidly progressing to severe pneumonia. The situation was alarming: no patients, including young and previously healthy health workers, had recovered. Many of the patients were in a critical condition, several required mechanical ventilatory support, and two had died. The spread to major cities around the world meant that any city with an international airport was at potential risk of imported cases. From the outset, WHO's objective was clear: to halt further international spread and interrupt human-to-human transmission through a global containment effort, and by so doing to minimize opportunities for the disease to establish endemicity (see Box 5.1).

The global response to SARS was in reality the roll out of a way of detecting and responding to outbreaks that had been developed over the preceding seven years by WHO and its partners, partly as a result of major weaknesses that came to light during the 1995 Ebola outbreak in the Democratic Republic of the Congo and during previous outbreaks of plague in India and cholera in Latin America. The SARS response depended on collaboration of the world's top public health and laboratory experts, and took advantage of up-to-date communication technologies, including the Internet and video and telephone conferencing.

Figure 5.1 Probable cases of SARS worldwide, 7 August 2003



Two principal partners of the WHO Global Outbreak Alert and Response Network (GOARN), an electronically interconnected network of experts and institutes formally set up in early 2000, contributed to the detection of the SARS outbreak. One was the Canadian Global Public Health Intelligence Network (GPHIN), a worldwide web-crawling computer application, used by WHO since 1997, that systematically searches for keywords in seven different languages to identify reports of what could be disease outbreaks. Throughout the outbreak, GPHIN provided the raw intelligence that helped WHO maintain up-to-date and high-quality information on indications that the disease might be spreading to new areas. The second partner was the WHO Influenza Laboratory Network of 110 laboratories in 84 countries that constantly keeps the world in general and vaccine manufacturers in particular informed of which strains of influenza are circulating, so that an effective influenza vaccine can be produced each year.

On 10 February 2003, GPHIN and other partners of GOARN identified reports of an outbreak associated with health worker mortality and the closing of hospitals in Guangdong. One day later the Chinese government officially reported to WHO an outbreak of respiratory illness, beginning in mid-November, involving 300 cases and five deaths in Guangdong Province. Just over a week later, on 19 February, an outbreak of avian influenza was reported to the WHO Influenza Laboratory Network by the collaborating laboratory in Hong Kong. This outbreak first came to light when a 33-year-old man died of an unknown cause after returning from a family trip to Fujian Province, China. His 8-year-old daughter had died of a similar disease while in Fujian Province and his 9-year-old son was hospitalized in Hong Kong with the same symptoms. It was from this son that avian influenza virus was isolated and reported to the Influenza Laboratory Network. The same influenza virus had been identified in Hong Kong in 1997. Control efforts at that time required the slaughter and incineration of all chickens in the many live markets there; human-to-human transmission was never established.

Box 5.1 The response to SARS in the Western Pacific Region

More than 95% of SARS cases occurred in the Western Pacific Region. As an immediate response, a SARS outbreak response and preparedness team – including international experts – was established in the Regional Office. The main objectives were to:

- contain and control the outbreaks;
- support the health care infrastructure in affected countries;
- provide guidance and assistance to enable vulnerable countries to prepare for the possible arrival of the virus;
- provide the most up-to-date information to health officials and respond to public concerns.

Teams of epidemiologists and infection control experts were immediately sent to China, including Hong Kong Special Administrative Region, as well as to the Philippines, Singapore and Viet Nam and across the southern Pacific, training health care workers in infection control procedures and preparing them for the possible arrival of the disease. Practical infection control and preparedness guidelines and training tools were developed, and the first version of preparedness guidelines was issued at the beginning of April. Logistic support and supplies (personal protective equipment, including masks, collection materials for blood and respiratory samples, and internationally approved containers for shipment of samples) were sent to both affected and unaffected countries, supported by a US$ 3 million grant from the Government of Japan.

Countries were classified according to three levels of risk and three levels of capability to respond to SARS cases, in order for WHO to prioritize its support to countries. WHO worked closely with countries to ensure that enhanced surveillance was put in place to enable early detection of cases and contact tracing. Guidelines were drawn up on enhanced surveillance, hospital and community infection control, international travel, laboratory procedures and public awareness. To improve public awareness, close contact was established with national media focal points, and the web site of the Western Pacific Regional Office was regularly updated.

A regional laboratory network was established to ensure that necessary testing for SARS could be done for countries with limited laboratory capacities. National and regional reference laboratories were identified and shipping of specimens was arranged between the laboratories.

WHO's efforts were paralleled by the contribution of Member States. Viet Nam was the first to interrupt local transmission of the virus. Other countries introduced a wide range of measures, including isolation, home quarantine and comprehensive contact tracing. The willingness of governments in the Western Pacific Region to put public health considerations ahead of economic concerns about the impact of SARS was crucial to the success of the collaborative effort.

This heightened level of alert led to the identification of an early SARS case in Viet Nam on 28 February 2003. At the same time as GOARN collected information about this outbreak in real time, it sent an international team of partners to work with the Viet Nam authorities to better understand the disease, and by 12 March GOARN had accumulated the initial information necessary to issue the first global alert. It was through the continued instant sharing of information by governments, public health experts, clinicians and laboratory scientists that evidence-based decisions could progressively be made, culminating in the successful containment of SARS.

Under GOARN, a virtual collaborative network of 11 leading laboratories, linked by a secure web site and daily teleconferences, identified the SARS causative agent and developed early diagnostic tests. The network, in turn, served as a model for similar electronically linked groups of clinical and epidemiological experts who pooled clinical knowledge and compiled the epidemiological data needed to chart the outbreak's evolution and assess the effectiveness of control interventions.

WHO issued daily updates about the outbreaks on its web site to keep the general public – especially travellers – informed and, as far as possible, to counter rumours with reliable information. Equally important, the web site was used to issue a range of evidence-based technical and practical guidelines for control as knowledge and information about the disease progressed and became available through the virtual groups of experts.

As more and more evidence accumulated through real time collaboration of public health experts, a range of additional evidence-based control measures became possible. It was soon evident, for example, that people with SARS continued to travel internationally by air after 15 March, and that some of them had infected passengers sitting nearby. At the same time it was also apparent that contacts of SARS patients likewise continued to travel, becoming ill once they arrived at their destination. Recommendations were therefore made that countries with major outbreaks should screen departing passengers to make sure that they did not have fever and other signs of SARS, or known contact with SARS patients.

As the outbreak continued in Hong Kong, contact tracing there further demonstrated that transmission of SARS was occurring outside the confined environment of the health care setting, and later suggested that it was also occurring following exposure to some factor in the environment, thus creating further opportunities for exposure in the general population. Additional evidence-based guidance was therefore made for sites where contact tracing could not link all cases to a chain of transmission, on the understanding that if the disease were spreading in the wider community it would greatly increase the risk to travellers and the likelihood that cases would be exported to other countries. This guidance was aimed at international travellers, and recommended that they postpone all but essential travel to designated areas in order to minimize their risk of becoming infected. Such guidance was also needed in view of the confusion created by several different national recommendations, many of which were based on criteria other than epidemiological data.

Authorities in areas where outbreaks were occurring responded to SARS with mass public education campaigns and encouraged populations to conduct daily fever checks. Hotlines and web sites answered questions. Screening measures were set up at international airports and border crossings, and procedures of infection control were reinforced in hospitals. Singapore drew on its military forces to conduct contact tracing, while Hong Kong adapted a tracing system that had been developed for use in criminal investigations and electronically mapped the location of all residences of cases. Chinese authorities opened hundreds of fever clinics throughout the country where suspected SARS cases were triaged. Heads of state and

ministers of health of of countries of the Association of Southeast Asian Nations (ASEAN) and the Asia–Pacific Economic Cooperation (APEC) met and resolved to establish closer collaborative mechanisms for disease surveillance and response. Health staff everywhere worked with dedication, and many, including WHO staff member Dr Carlo Urbani, lost their lives.

On 5 July 2003, WHO announced that Taiwan, China, where the last known probable case of SARS had been isolated 20 days earlier, had broken the chains of human-to-human transmission. A recurrence of SARS cannot, however, be ruled out. Further research on many unresolved questions is needed. In the meantime, systems are now in place to detect a re-emergence should it occur *(4)*.

The impact of SARS

The economic impact of the SARS outbreak has been considerable and illustrates the importance that a severe new disease can assume in a closely interdependent and highly mobile world. Apart from the direct costs of intensive medical care and control interventions, SARS caused widespread social disruption and economic losses. Schools, hospitals, and some borders were closed and thousands of people were placed in quarantine. International travel to affected areas fell sharply by 50–70%. Hotel occupancy dropped by more than 60%. Businesses, particularly in tourism-related areas, failed, while some large production facilities were forced to suspend operations when cases appeared among workers.

A second impact is more positive: SARS stimulated an emergency response – and a level of media attention – on a scale that has very likely changed public and political perceptions of the risks associated with emerging and epidemic-prone diseases. It also raised the profile of public health to new heights by demonstrating the severity of adverse effects that a health problem can also have on economies and social stability. The resulting high level of political commitment was decisive in the containment of SARS and has much to say about the ability of nations to achieve public health results even when drugs and vaccines are not available to cure or prevent the infection.

Lessons learnt

Although much about SARS – including its potential to reoccur – remains to be learnt through systematic analysis of existing data, and focused research activities in China, several important lessons are already apparent. WHO is applying these lessons across the entire Organization as it responds to the HIV/AIDS emergency.

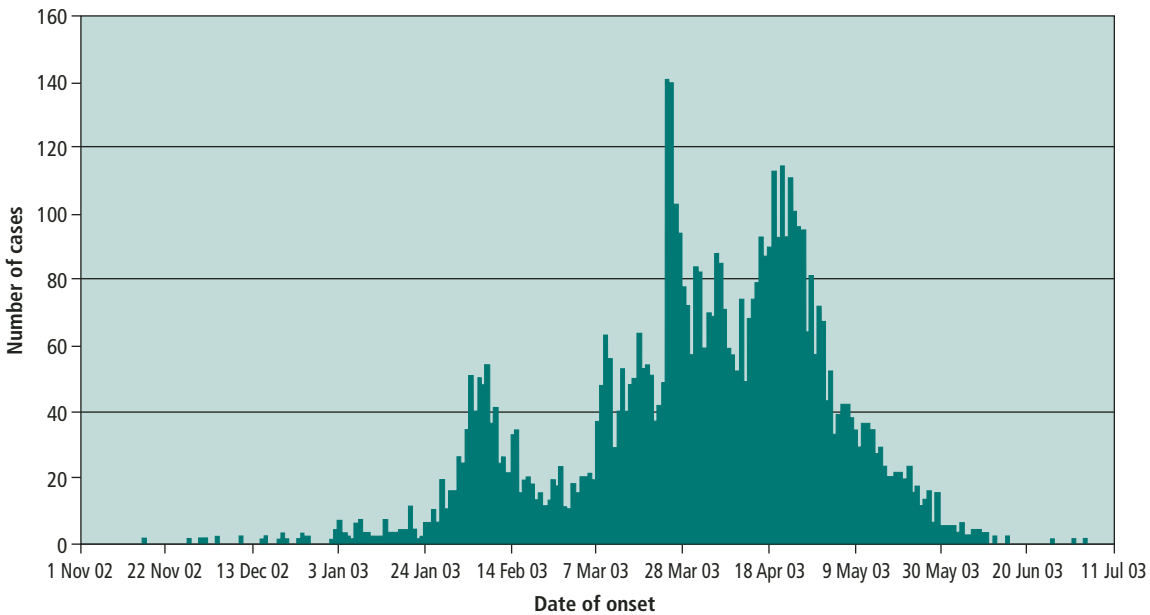
The first and most compelling lesson concerns the need to report, promptly and openly, cases of any disease with the potential for international spread. Attempts to conceal cases of an infectious disease, for fear of social and economic consequences, must be recognized as a short-term stop-gap measure that carries a very high price: the potential for high levels of human suffering and death, loss of credibility in the eyes of the international community, escalating negative domestic economic impact, damage to the health and economies of neighbouring countries, and a very real risk that outbreaks within the country's own territory will spiral out of control. Following the adoption during the World Health Assembly in May 2003 of a resolution on the International Health Regulations, WHO has been confirmed in its responsibility to take on a strong coordinating role in leading the fight against any infectious disease that threatens international public health *(5)*. In a second resolution specific to SARS,

all countries are urged to report cases promptly and transparently, and to provide information requested by WHO that could help prevent international spread. It was explicitly acknowledged that across-the-board strengthening of systems for outbreak alert and response was the only rational way to defend public health security against not only SARS but also against all future infectious disease threats, including those that might be deliberately caused *(6)*.

The second lesson is closely related: timely global alerts, especially when widely supported by a responsible press and amplified by electronic communications, worked well to raise awareness and vigilance to levels that can prevent imported cases of an emerging and transmissible infection from causing significant outbreaks. The global alerts issued by WHO on 12 and 15 March provide a clear line of demarcation between areas with severe SARS outbreaks and those with none or only a few secondary cases. Following the SARS alerts, all areas experiencing imported cases, with the exception of Taiwan, China, either prevented any further transmission or kept the number of locally transmitted cases very low. Figure 5.2 shows the weekly onset of 5910 cases. A climate of increased awareness also helps to explain the speed with which developing countries readied their health services with preparedness plans and launched SARS campaigns, often with WHO support, to guard against imported cases.

The third lesson is that travel recommendations, including screening measures at airports, appear to be effective in helping to contain the international spread of an emerging infection. Initial analysis of data on in-flight transmission of SARS has implicated four flights in the exposure of 27 probable cases, of which 22 occurred on a single flight from Hong Kong to Beijing, China, on 15 March. Some of these cases may also have been exposed elsewhere because of being in the same tour group. Following the recommendation of airport screening measures on 27 March, no cases associated with in-flight exposure were reported; and initial information reveals that two probable SARS cases were identified by airport screening procedures in Hong Kong and immediately hospitalized. Travel recommendations based on the

Figure 5.2 Probable cases of SARS worldwide,[a] 1 November 2002–11 July 2003



[a] This graph does not include 2527 probable cases of SARS (2521 from Beijing, China), for whom no dates of onset are currently available.

epidemiological evidence also gave areas where outbreaks were occurring a benchmark for quickly containing SARS, and then regaining world confidence that the area was safe from the risk of SARS transmission. In fact, passenger movement figures provided by Hong Kong International Airport show a rapid rebound from the lowest number of passengers, 14 670 (recorded just before 23 May when the travel recommendations were removed) to 54 195 on 12 July, a little over a month later.

The fourth lesson concerns international collaboration: the world's scientists, clinicians and public health experts are willing to set aside academic competition and work together for the public health good when the situation so requires. International collaboration greatly advanced understanding of the science of SARS. One month after the laboratory network was established, participating scientists collectively announced conclusive identification of the SARS virus; complete sequencing of its RNA followed shortly afterwards. The network of clinical experts provided a platform for comparison of patient management strategies to indicate to the world which treatments and strategies were effective. In addition, the epidemiology network confirmed the modes of transmission of SARS and began the long-term collaboration needed to understand clearly the clinical spectrum of disease, including its case fatality ratio, while also providing the information needed to regularly reassess and adjust the case definition.

Lesson five is that weaknesses in health systems can permit emerging infections to amplify and spread, and can compromise patient care. The strengthening of health systems thus deserves high priority. The people at greatest risk for SARS were health workers who either became infected by close face-to-face contact with patients or by procedures that brought them into contact with respiratory secretions. Women predominate among the lower ranks of health personnel in many countries; available data reveal that infected health care workers were 2.7 times more likely to be women than men, while infection was roughly equal between the sexes in the general population. The surge of SARS patients placed an enormous burden on health services, requiring facilities for isolation, long periods of intensive and expensive care, and the use of demanding and socially disruptive measures such as mass screening, contact tracing, active surveillance of contacts and – at some outbreak sites – enforced quarantine. Even in areas with highly developed social services, the burden of coping with SARS, including the large number of hospitals with patients and the high number of health workers who became infected, often required closing some hospitals and sections of others. As a result of SARS outbreaks, many long-standing and seemingly intractable problems that have traditionally weakened health systems are being corrected in fundamental and often permanent ways. New surveillance and reporting systems, methods of data management, mechanisms for collaborative research, hospital policies, procedures for infection control, and channels for informing and educating the public are part of the initial positive legacy of SARS that will shape the capacity to respond to future outbreaks of new or re-emerging infections.

Lesson six is that in the absence of a curative drug and a preventive vaccine, existing interventions, tailored to the epidemiological data and supported by political commitment and public concern, can be effectively used to contain an outbreak. The virtual laboratory, and clinical and epidemiological collaborating networks regularly provided information that was used by WHO and its partners to update guidance for containment. Initial guidance was provided for containing outbreaks nationally – as additional evidence was obtained, guidance to limit international spread was also provided. Areas where outbreaks were occurring, and countries which considered themselves at risk of imported cases from these areas, adapted WHO guidance for their use. Some countries introduced active surveillance of suspected contacts using

surveillance cameras or military personnel. Others relied on self-surveillance by contacts who voluntarily isolated themselves in their homes and regularly checked for fever. Measures introduced at airports ranged from passive screening of passengers, involving optional completion of questionnaires, to the use of interviews conducted by health workers and sophisticated infrared equipment to screen all passengers for fever and indications of possible exposure. In addition to maximizing the impact of surveillance and screening, these measures were also considered by governments to be reassuring for national citizens as well as international travellers.

The seventh lesson highlights one of the major difficulties faced during the containment activities for SARS: risk communication about new and emerging infectious diseases is a great challenge. Work along these lines is currently under way in conjunction with the risk that a biological agent might be used in an act of terrorism.

SARS will not be the last new disease to take advantage of modern global conditions. In the last two decades of the 20th century, new diseases emerged at the rate of one per year, and this trend is certain to continue *(7)*. Not all of these emerging infections will transmit easily from person to person as does SARS. Some will emerge, cause illness in humans and then disappear, perhaps to recur at some time in the future. Others will emerge, cause human illness and transmit for a few generations, become attenuated, and likewise disappear. And still others will emerge, become endemic, and remain important parts of our human infectious disease ecology.

The rapid containment of SARS is a success in public health, but also a warning. It is proof of the power of international collaboration supported at the highest political level. It is also proof of the effectiveness of GOARN in detecting and responding to emerging infections of international public health importance. At the same time, containment of SARS was aided by good fortune. The most severely affected areas in the SARS outbreak had well-developed health care systems. Had SARS established a foothold in countries where health systems are less well developed cases might still be occurring, with global containment much more difficult, if not impossible.

Although control measures were effective, they were extremely disruptive and consumed enormous resources – resources that might not have been sustainable over time. If SARS reoccurs during an influenza season, health systems worldwide will be put under extreme pressure as they seek to isolate all those who fit the clinical case definition until diagnosis can be ascertained. Continued vigilance is vital.

This chapter has illustrated how quickly a new disease can threaten global health. Thankfully, not all diseases move at such speed; but some are more stealthy and more lethal. Chapter 6 looks at three epidemics that are advancing at different rates in developing countries today: the spread of cardiovascular and other noncommunicable diseases; the tobacco epidemic; and the rising toll of deaths and injuries from road traffic hazards.

Note: The evolution of the global SARS outbreak has been chronicled in daily situation updates, archived on the SARS pages at the WHO web site: http://www.who.int/csr/sars/en/index.html.

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Chapter Six

Neglected Global Epidemics:
three growing threats

Today, the burden of deaths and disability in developing countries caused by noncommunicable diseases, particularly cardiovascular conditions, outweighs that imposed by long-standing communicable diseases. To tackle this well-recognized "double burden", this chapter proposes a "double response" which integrates prevention and control of both communicable diseases and noncommunicable diseases within a comprehensive health care system.

The chapter also examines the stealthy but rapid evolution of two other epidemics, and ways to respond to them. The globalization of tobacco-related diseases can be countered through the WHO Framework Convention on Tobacco Control. Simultaneously, the "hidden epidemic" of road traffic casualties and traffic-related environmental hazards can be reduced if developing countries adapt successful road safety and other improvements from elsewhere to meet their own needs.

6
Neglected Global Epidemics: three growing threats

Cardiovascular diseases: the need to act

Twenty-five years ago, when the delegates at the international Alma-Ata conference drew up a list of eight essential elements for primary health care, there was no mention of the treatment or prevention of conditions such as heart disease and stroke. The priority was to deliver adequate nutrition, safe water and basic sanitation, maternal and child health care, immunization against the major infectious diseases, the prevention and control of local endemic diseases, and the provision of essential drugs to the poorer countries of the world.

Cardiovascular diseases (CVDs) – heart disease and stroke – and other noncommunicable diseases were considered diseases of the industrialized countries – so-called "Western diseases" – brought about by ways of life utterly different from those in most of Africa, Asia and many other parts of the developing world. It is noteworthy, however, that as early as 1954 the delegate of India to the World Health Assembly called for steps to be taken towards the prevention of CVDs in developing countries.

The global health agenda is still dominated by the notion that communicable diseases need to be prevented and treated before CVDs receive attention. There is a lingering view that CVDs are mostly confined to wealthy people and are caused by natural ageing and degenerative processes. There persists a widespread belief that they are "lifestyle diseases", fully under the control of individual decisions.

The reality is quite different. CVDs have not only emerged in all but the very poorest countries, but are already well advanced; this growing burden has real potential to hinder social and economic development. Risk factors are indicators of future health status, and five of the top 10 risks worldwide are specific to noncommunicable diseases *(1)*. These include raised blood pressure, tobacco use, alcohol consumption, cholesterol, and obesity or overweight. This is part of the well-documented epidemiological transition called the "double burden" that sees the arrival of the whole group of noncommunicable diseases with their shared risk factors on top of the persisting threat of communicable diseases. As a consequence, health systems are now required that can deal comprehensively with all common diseases, irrespective of their origin.

As highlighted in Chapter 1, in today's world most deaths are attributable to noncommunicable diseases (32 million) and just over half of these (16.7 million) are the result of CVD; more than one-third of these deaths occur in middle-aged adults. In developed countries, heart disease and stroke are the first and second leading causes of death for adult men and women.

These facts are familiar and hardly surprising. What is surprising, however, is that in some developing countries, CVDs have also become the first and second leading causes, responsible for one-third of all deaths (see Figure 6.1).

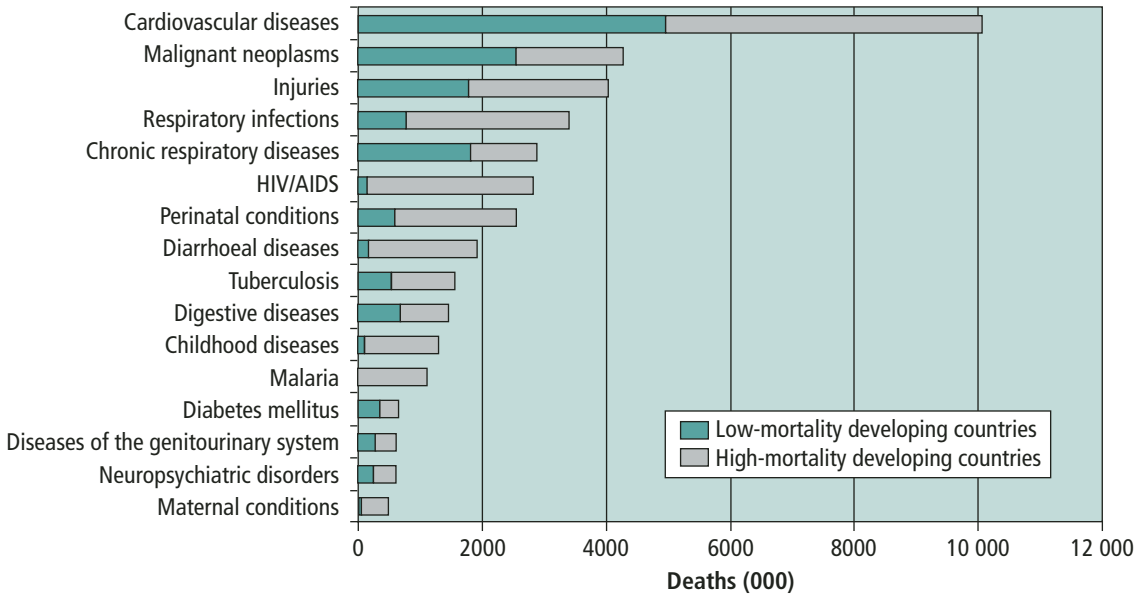
In fact, twice as many deaths from CVD now occur in developing countries as in developed countries. Overall, in developing countries, CVD ranks third in disease burden (after injuries and neuropsychiatric disorders). Even in high-mortality developing countries, CVD is ranked very high.

A particular cause of concern is the relatively early age of CVD deaths in developing countries compared with those in the developed regions *(2)*. One in two of the CVD-related deaths in India occur below the age of 70 years, compared with one in five in economically well-developed nations. In both rural and urban areas of the United Republic of Tanzania, stroke mortality rates are three times higher than those in England and Wales. What is not often recognized is that, globally, CVDs account for as many deaths in young and middle-aged adults as HIV/AIDS.

This does not mean that communicable diseases have quietly gone away, require less funding, or are now safely under control. The advent of HIV/AIDS shattered that hope (see Chapter 3). Malaria and tuberculosis are among other enormous threats that remain and are growing. In addition, as pointed out in Chapter 5, new infectious diseases have been emerging at the rate of one a year for the last 20 years or more: SARS is the latest. So it is legitimate that public health communities remain vigilant towards infectious diseases, and that this vigilance begins with primary health care, in accordance with the Declaration of Alma-Ata. However, the world cannot afford to lose sight of the growing social and economic threats posed by CVD and other noncommunicable diseases.

Ironically, CVDs are now in decline in the industrialized countries first associated with them. But from that irony stems hope: the decline is largely a result of the successes of primary prevention and, to a lesser extent, treatment. What has worked in the richer nations – and

Figure 6.1 Deaths attributable to 16 leading causes in developing countries, 2001



especially for the most advantaged members of these societies – can be just as effective in their poorer counterparts.

There is now abundant evidence to initiate effective actions at national and global levels to promote and protect cardiovascular health through population-based measures that focus on the main risk factors shared by all noncommunicable diseases. The population-wide application of existing knowledge has the potential to make a major, rapid and cost-effective contribution to their prevention and control and to benefit all segments of the population *(3)*.

The main issue for policy-makers, at all levels of public health in developing countries, is how to deal with the growing burden of epidemics of noncommunicable diseases in the presence of persisting communicable disease epidemics. Furthermore, this challenge must be faced even where health system resources are already inadequate. Although considerable policy gains can be made very cheaply, especially intersectorally, extra provision must be found. This requires a greater share of national resources for health care, better use of existing resources, and new sources of funding. A special tax on tobacco products for disease prevention programmes is a readily available source of new funds for most countries.

The causes are known

The good news is that an impressive body of research has identified the causes of the CVD epidemics within populations *(1)*. Global trade and marketing developments continue to drive the nutrition transition towards diets with a high proportion of saturated fat, sugar and salt. At the same time, protective elements like fibre and phytochemicals in fresh fruit and vegetables are being progressively depleted in diets. When combined with tobacco use and low levels of physical activity, this diet leads to population-wide atherosclerosis and the widespread distribution of CVDs. Variations in these same major risk factors explain much of the major difference in rates of CVDs between countries.

In summary, the major CVD risk factors of tobacco use, inappropriate diet and physical inactivity (primarily expressed through unfavourable lipid concentrations, high body-mass index, and raised blood pressure) explain at least 75–85% of new cases of coronary heart disease *(4)*. In the absence of elevations of these risk factors, coronary heart disease is a rare cause of death. Unfortunately, the vast majority of the populations in almost all countries are at risk of developing CVD because of higher than optimal levels of the main risk factors. Only about 5% of adult men and women in wealthy countries are at low risk with optimal risk factor levels. There are only a few very poor countries in which these factors have not yet emerged as major public health problems.

Policies are available

One of the most exciting possibilities to emerge in public health in recent years is the integration of communicable disease and CVD prevention and control into comprehensive health systems led by primary care. Bringing this to fruition will mean reshaping the future of primary health care in response to a changing world. It would see all patients being offered – across their lifespan – prevention, treatment and long-term management of both sides of the double burden.

Achieving such integration will not be easy. Apart from other considerations, it will require cooperation between professional rivals, who each regard their side of the double burden to be more important than the other, and who compete for their share of limited resources. Such competitiveness has long been entrenched across the battlefields of public health. And

yet, as the chapter of this report on SARS has shown, cross-disciplinary collaboration is not only possible but can be enormously rewarding to all concerned. In the case of this new epidemic, the world's best scientists, clinicians and public health experts were willing to set aside academic competition and work together for the public good – because the circumstances so clearly required it. Paradoxically, a matching policy response to tackle public health challenges of even greater magnitude is lacking: the mounting menace of the global CVD epidemic is evolving rapidly.

Another critical policy issue, especially for poor countries, concerns the appropriate balance between primary and secondary prevention and between the population and high-risk approaches to primary prevention. If the goal is to increase the proportion of the population at low risk and to ensure that all groups benefit, the strategy with the greatest potential is the one directed at the whole population, not just people with high levels of risk factors or established disease *(5)*. All other strategies will, at best, only blunt the epidemics and likely increase inequalities; they will not prevent the epidemics. Even so, with ageing populations, health systems will continue to face the unrelenting demands of costly care, both acute and chronic (see Box 1.3 in Chapter 1).

The ultimate public health policy goal is the reduction of population risk, and since most of the population in most countries is not at the optimal risk level, it follows that the majority of prevention and control resources should be directed towards this goal in the entire population. Evidence is available in support of the cost-effective policies required for the task of making the small – but powerful and surprisingly rapid – shifts in risk distributions in entire populations in a favourable direction *(1)*. Similarly, management decisions based on measures of overall risk are more cost-effective than those based on single risk factors.

Untold lives lost are lost unnecessarily because of inadequate acute and long-term management of CVD. Relatively cheap interventions for CVD are available *(6)*, and single combination pills including aspirin and drugs for blood pressure and cholesterol lowering for possible use in chronic care are under development. Even in wealthy countries, however, the potential of these and other interventions for secondary prevention is far from fully utilized. The situation in poorer countries is even less satisfactory. There are many opportunities for coordinated CVD risk reduction, care and long-term management. Smoking cessation and the identification and management of diabetes, for example, are just two priorities. Cost-effective interventions, such as the use of aspirin in people with symptoms of chest pain, would prevent a quarter of the deaths associated with heart attacks and are much more cost-effective than more radical interventions such as revascularization procedures, which are inevitably restricted to a minority of patients with CVD.

Acting now and measuring progress

There have been striking and rapid reductions in CVD death rates in wealthy countries – especially benefiting the wealthiest and most educated – because of comprehensive approaches including both improved prevention and the management of high-risk people. Policy interventions in developed and developing countries can lead to a surprisingly rapid response. In Mauritius, government action to encourage consumption of healthy oils resulted in a rapid decrease in population levels of blood cholesterol. In Finland, government agricultural subsidies were used to reduce dairy farming and increase berry production. And in Poland, increased consumption of fresh fruit and vegetables, consequent to changes in the policy environment, were associated with a sharp decline in CVD death rates. A WHO/FAO expert consultation report on diet, nutrition and the prevention of chronic diseases reviewed the

evidence and provided recommendations for nutrient intake goals for the prevention of CVD and other noncommunicable diseases *(7)*.

A coherent policy framework, encompassing legislation, regulation and mass education is critical for CVD prevention and control, since individual behaviour change is difficult in the absence of conducive environmental alterations. A suggested stepwise framework for a comprehensive response to CVD prevention and control is outlined in Table 6.1 and can be modified according to national needs, goals and targets.

Table 6.1 A stepwise approach for prevention and control of noncommunicable diseases

	Population approaches		Individual high-risk approach
Resource level	**National level**	**Community level**	
Step 1: Core	WHO Framework Convention on Tobacco Control (FCTC) is ratified in the country. Tobacco control legislation consistent with the elements of the FCTC is enacted and enforced. A national nutrition and physical activity policy consistent with the Global Strategy is developed and endorsed at Cabinet level; sustained multisectoral action is evident to reduce fat intake, reduce salt (with attention to iodized salt where appropriate), and promote fruit and vegetable consumption. Health impact assessment of public policy is carried out (for example: transport, urban planning, taxation, and pollution).	Local infrastructure plans include the provision and maintenance of accessible and safe sites for physical activity (such as parks and pedestrian-only areas). Health-promoting community projects include participatory actions to cope with the environmental factors that predispose to risk of noncommunicable diseases: inactivity, unhealthy diet, tobacco use, alcohol use, etc. Active health promotion programmes focusing on noncommunicable diseases are implemented in different settings: villages, schools and workplaces.	Context-specific management guidelines for noncommunicable diseases have been adopted and are used at all health care levels. A sustainable, accessible and affordable supply of appropriate medication is assured for priority noncommunicable diseases. A system exists for the consistent, high-quality application of clinical guidelines and for the clinical audit of services offered. A system for recall of patients with diabetes and hypertension is in operation.
Step 2: Expanded	Tobacco legislation provides for incremental increases in tax on tobacco, and a proportion of the revenue is earmarked for health promotion. Food standards legislation is enacted and enforced; it includes nutrition labelling. Sustained, well-designed, national programmes (counter-advertising) are in place to promote non-smoking lifestyles.	Sustained, well-designed programmes are in place to promote: • tobacco-free lifestyles, e.g. smoke-free public places, smoke-free sports; • healthy diets, e.g. low-cost, low-fat foods, fresh fruit and vegetables; • physical activity, e.g. "movement" in different domains (occupational and leisure).	Systems are in place for selective and targeted prevention aimed at high-risk populations, based on absolute levels of risk.
Step 3: Optimal	Country standards are established that regulate marketing of unhealthy food to children. Capacity for health research is built within countries by encouraging studies on noncommunicable diseases.	Recreational and fitness centres are available for community use.	Opportunistic screening, case-finding and management programmes are implemented. Support groups are fostered for tobacco cessation and overweight reduction. Appropriate diagnostic and therapeutic interventions are implemented.

Adapted from: *(8)*.

Unfortunately, in most countries the response to CVD prevention and control is still based on the infectious disease paradigm. Consequently, the global and national capacity to respond to CVD epidemics is woefully inadequate. Few countries have implemented comprehensive prevention and control policies *(9)* and development of capacity, especially for policy research, has not kept pace with the epidemiological transition. The gaps between the needs for CVD prevention and control and the capacity to meet them will grow even wider unless urgent steps are taken.

Global norms are needed to balance the otherwise unrestrained influences of powerful actors. To promulgate such norms, public health professionals need to learn how to influence the deliberations of bodies such as the World Trade Organization – where health issues are increasingly considered – and to develop stronger ways of dealing with products with health impacts. A combination of multistakeholder and intergovernmental codes and other nonbinding measures may be required. The Framework Convention on Tobacco Control, described in the following section, is one example of a legally binding global norm.

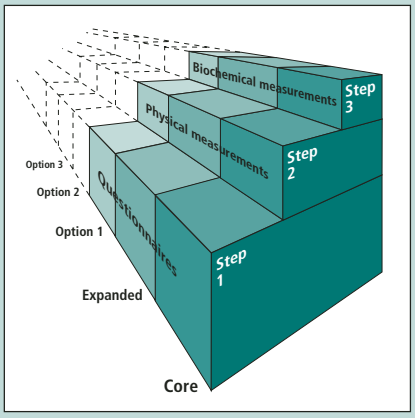
WHO and governments cannot confront the challenges of CVD prevention and control alone. As with tobacco control, partnerships and interactions with international consumer groups and global commercial multinationals are essential. WHO is developing a Global Strategy on Diet, Physical Activity and Health as a strategic framework within which WHO and Member States can work together across sectors in preventing CVD and other noncommunicable diseases. This population-wide prevention strategy is based on extensive consultations with stakeholders: Member States, the United Nations and intergovernmental organizations, civil society and the private sector.

Globally, there is still only limited advocacy for the CVD prevention and control agenda. What there is tends to be fragmented. The lack of unified advocacy for health promotion

Box 6.1 Measuring progress: integrated surveillance of noncommunicable disease risk factors

The goal of surveillance is to monitor emerging patterns and trends in major cardiovascular disease (CVD) and other noncommunicable disease (NCD) risk factors and to measure the effectiveness of prevention interventions in countries. Two tools have been developed for this purpose: the WHO STEPwise approach to Surveillance (STEPS) of noncommunicable disease risk factors *(10)* and the WHO Global NCD InfoBase *(11)*.

STEPS is a sequential process, starting with gathering information on key health behaviours by the use of questionnaires (Step 1), then moving to simple physical measurements (Step 2), and only then recommending the collection of blood samples for biochemical assessment (Step 3). This framework builds a common approach to defining core variables for surveys, surveillance and monitoring systems. The goal is to achieve data comparability over time and between countries. The methodology has been developed in close collaboration with WHO regional offices and is easily adaptable to the needs of Member States. It offers an entry point for low-income and middle-income countries to get started in surveillance and prevention activities for noncommunicable diseases. By increasing local capacity, STEPS aims to achieve data comparability over time and between countries. Many Member States have now been trained in the STEPS methodology. The approach is designed to build on existing surveillance activities, but can also be introduced as a new methodology to countries where there are no surveillance systems currently in place. Data collected using the STEPwise approach is fed into the WHO Global NCD InfoBase.



The WHO Global NCD InfoBase is a database designed to hold existing country-level data on risk factors of noncommunicable diseases. Its strength is that the data can be displayed and used to derive a single best prevalence estimate for any given country. This approach allows transparency in the use of country data sources. It is a major improvement on previous WHO estimates, which, in the absence of such a relational database, relied on selected studies which may have excluded many available sources and lacked transparency.

compares poorly with the growing dominance of commercial and consumer groups who have placed treatment at the centre of health policy debates and funding priorities. Broader alliances of major health professional bodies, consumer groups and others are needed to promote the prevention of major risk factors for CVD and to track progress to agreed national and global goals – perhaps modelled on the Millennium Development Goals (see Box 6.1). Since the determinants of CVD are multisectoral, advocacy and action, too, must extend well beyond the health sector. The involvement of nongovernmental organizations in articulating the demand for speedy implementation of policies and programmes relevant to CVD control is critical for catalysing policy change and for mobilizing communities to ensure that the benefits flow to the entire population.

While the pace of globalization of the major risks for CVDs is increasing, progress towards CVD prevention and control is slow. Sustained progress will occur only when governments, international agencies, nongovernmental organizations and civil society acknowledge that the scope of public health activities must be rapidly broadened to include CVDs and their risk factors.

The challenge is to work towards the integration of prevention and control of both communicable diseases and CVDs, while acknowledging the different time scales of these epidemics and the competition for limited resources. A place must be found for the prevention and control of CVD on the agenda of health systems led by primary care. At Alma-Ata 25 years ago it was deemed unnecessary. Today, it is indispensable.

Tobacco control: strengthening national efforts

The consumption of cigarettes and other tobacco products and exposure to tobacco smoke are the world's leading preventable cause of death, responsible for about 5 million deaths a year, mostly in poor countries and poor populations. Latest estimates reveal that, of the nearly 4 million men and 1 million women who died, over 2 million men and 380 000 women were in developing countries *(12)*. The toll will double in 20 years unless available and effective interventions are urgently and widely adopted.

Globalization of the tobacco epidemic can undermine even the best national control programme. The epidemic is being spread and reinforced worldwide by a complex mix of factors with cross-border effects, including trade liberalization, foreign direct investment, and other factors such as global marketing, transnational tobacco advertising, promotion and sponsorship, and the international movement of contraband and counterfeit cigarettes. Recognition of this situation led to the adoption by 192 Member States at the World Health Assembly in May 2003 of the WHO Framework Convention on Tobacco Control (WHO FCTC). This, the first treaty negotiated under the auspices of WHO, constitutes a major turning point in tackling a major global killer: it signals a new era in global and national tobacco control activities. The FCTC is an evidence-based treaty that reaffirms the right of all people to the highest standard of health. It represents a paradigm shift in developing a regulatory strategy for addictive substances: in contrast to previous drug control treaties, the FCTC asserts the importance of demand reduction strategies as well as supply issues.

Major challenges lie ahead as WHO works with Member States to implement the agreement in countries. The process of the FCTC's creation also reveals the price paid for delay between vision and action. It has taken almost 10 years to bring the idea of such an instrument to fruition. During that time, more than 30 million people have died of tobacco-related illnesses, 70% of them in low-income and middle-income countries and half before the age of 70.

Those who died before 70 years of age lost, on average, 28 years of life *(13)*. As entry into force of the Convention draws nearer, strengthening national capacity in tobacco control becomes an important public health priority in all countries.

This section looks forward to the timely ratification, entry into force, and implementation of the FCTC and the opportunities thus presented for further progress in national tobacco control. It also examines the challenges of building and strengthening national political, managerial and technical tobacco control capacity.

Guiding tobacco control

Total tobacco consumption is on the rise. The number of smokers in the world, estimated at 1.3 billion today, is expected to rise to 1.7 billion by 2025 if the global prevalence of tobacco use remains unchanged *(14)*. Every second smoker will die of a tobacco-caused disease. Until recently, the global response to this major public health challenge had been inadequate.

In May 2003 the World Health Assembly adopted by consensus the WHO Framework Convention on Tobacco Control (FCTC). Negotiated among WHO Member States over four years, this international legal instrument is designed to limit the harm to health caused by tobacco products. It comprises many diverse aspects of tobacco control, including: advertising, promotion and sponsorship; packaging and labelling; price and tax measures; sales to and by young persons; passive smoking and smoke-free environments; and treatment of tobacco dependence. The Convention represents a global minimum standard, and the future Parties to the Convention are encouraged by provisions in the treaty to go further and implement stricter measures. Furthermore, the negotiation of future protocols to the Convention by the Conference of the Parties will result in a treaty regime that will continue to evolve and to provide for more specific obligations on certain topics. The FCTC is a delicately balanced instrument adopted after vigorous negotiations, which took into account relevant scientific, economic, social and political considerations.

The FCTC's adoption by the World Health Assembly opens the treaty for signature and ratification by individual Member States. The Convention is available for signature from 16 June 2003 until 29 June 2004, and from 30 June 2004 for ratification.

The signing of the Convention indicates a Member State's intention to ratify the treaty but does not carry substantial obligations other than agreeing not to undermine the objective of the Convention; it provides, however, an important political commitment by a country to move towards ratification. Ratification provides the consent of a country to become legally bound by the treaty and commits it to implement the provisions of the treaty in good faith once the treaty enters into force. The Convention will come into force of law 90 days after the treaty has been ratified by 40 Member States. At that time, countries that have ratified it will be legally bound by its provisions. Countries that do not ratify the treaty are not obliged to implement its provisions.

Not all treaties provide for funding and technical assistance for the implementation of the instrument. The FCTC, however, belongs to the unique family of international agreements that undertakes to provide for such resources. The Convention commits Parties to provide funding for their national tobacco control measures, encourages the use of innovative national, regional and international funding mechanisms to provide additional resources for tobacco control, and leaves the question of the possible establishment of a voluntary global fund or other appropriate financial mechanisms to be determined in the future by the Conference of the Parties. As evidence of the power of the FCTC process, the issue of tobacco control has been placed firmly on the agenda of development funding as a priority.

As in the negotiation of the FCTC, tobacco control activists in health professions, concerned nongovernmental organizations and grass-roots groups have an important role on the international stage during the ratification process. They can continue to promote the ratification and implementation of the FCTC and the introduction of effective national legislation in support of the Convention.

National policies and programmes

A comprehensive public health approach to tobacco control effectively prevents the beginning of tobacco use and promotes its cessation, through a range of measures including tax and price policy, restrictions on tobacco advertising, promotion and sponsorship, packaging and labelling requirements, educational campaigns, restrictions on smoking in public places and cessation support services. A comprehensive approach must include young people and women and reach the entire population.

National policies must also confront fresh challenges such as regulatory frameworks for new tobacco products that are just beginning to appear on the market. Moreover, with the adoption of the FCTC, the definition of a comprehensive tobacco control strategy has now been redefined to include the transnational components of tobacco control, as a complement to national and local measures.

Few countries have implemented the comprehensive measures needed to create a significant decline in tobacco use. The policy measures known to have the biggest impact on individual levels of consumption, cessation rates and initiation rates require sustained political will and engagement, and above all effective and well-enforced legislation.

The capacity for effective tobacco control is lacking in most countries. Most do not have the necessary infrastructure or human resources to sustain a basic tobacco control programme. As an example, few national governments have people working full-time on tobacco control. In many countries, civil society has not yet been mobilized around the issue, so even when governments have adequate political will to propose tobacco control measures, tobacco companies can easily oppose and weaken policies. Even where the ministry of health is supportive of action it may be unable to make its case successfully above the voices of other more influential ministries.

Building national capacity

The success of the Convention largely depends on countries ratifying the treaty and implementing effective tobacco control measures. Building and strengthening national capacity in political, managerial and technical aspects of tobacco control is the key to a systematic multisectoral approach. Only this approach will ensure sustainable community and governmental action for comprehensive tobacco control efforts at the local, national and global levels.

Many countries have not yet developed national plans of action for tobacco control, largely because of lack of consensus and political commitment. Where such plans exist, policy instruments may remain ineffective because of weak enforcement. Governments and civil society need to be convinced that investing resources to prepare for tobacco control will reap benefits in the medium and longer term. Continuous monitoring of tobacco industry activities and strategies will be required to counteract the industry's manoeuvres to undermine tobacco control efforts. Strong political commitment and engagement are essential.

While the health sector is in large measure supportive of tobacco control, it cannot on its own bring the resources, expertise and political will needed to advance change. This requires support and commitment from all the relevant sectors in the national government. Tobacco control efforts are more likely to be sustained when incorporated into existing national, state and district-level health structures.

The expected outcome of building national capacity is a comprehensive, effective and sustainable strategy for multisectoral national tobacco control programmes and policies. Here, the role of WHO is to coordinate global expertise, enhance leadership, facilitate assistance to front-line efforts, and promote partnerships with governments and civil society to foster the implementation of more effective tobacco control strategies. Many success stories are available to guide countries; two are summarized in Box 6.2.

Integrating tobacco control into health systems

Treatment of tobacco dependence is another possible policy measure in low-income and middle-income countries *(17)*. As the projections in Figure 6.2 demonstrate, a mix of effective prevention and treatment measures will avert significantly more tobacco-caused deaths within the coming decades compared with prevention alone *(18)*. Cessation programmes for adult smokers are essential for rapid population health improvements over the next 20–30 years, since the benefits of preventing young people from taking up smoking will become apparent only after several decades. The Global Youth Tobacco Survey showed that most young smokers in the Western Pacific Region wished to stop smoking (see Box 6.3).

The delivery of cost-effective treatment of tobacco dependence in most countries is hampered by many factors, including: the lack of integration of tobacco dependence treatment into health care systems; lack of skills of health care providers; high price of nicotine replacement therapy products and cessation services; and the strict regulation of such products. Support and greater access to treatment provided through the health care systems will help the poor populations who are most likely to smoke *(19)*. All health providers must be involved, including oral health professionals who, in many countries, reach a large proportion of the healthy population. A supportive environment is essential to support smoking cessation programmes and this requires strong government action, for example, in the promotion of smoke-free environments and communication and awareness measures to reduce the social acceptability of tobacco use *(20)*.

Box 6.2 Examples of successful tobacco control strategies

Tobacco excise taxation in South Africa

The past 10 years have witnessed a major shift in government policy on tobacco control in South Africa, which rests on two important pillars: legislation and excise tax increases. The government elected in 1994 announced an increase in tax on tobacco products to 50% of the retail price (at that point, excise taxes amounted to 21% of the retail price and the total tax burden was 32% of the retail price). In 1997, the Minister of Finance announced that the 50% target had been achieved. Subsequent tax increases were aimed at keeping the tax percentage at the same level. Over the past decade the real retail price has more than doubled: cigarettes, compared with a basket of other goods and services, have become very expensive. Along with other tobacco control interventions, tax increases have contributed to a 33% reduction in tobacco consumption. In addition, real government revenue from tobacco taxes has more than doubled *(15)*.

Health warnings in Thailand

The first health warnings on cigarette packets in Thailand were introduced in 1974. Since 1989, many changes have been made to the messages, as an important component of a comprehensive control policy. The health warnings were improved in stages, with a greater variety of texts and stronger language. The number of rotating warnings has increased from one to twelve. The size of the warning area on cigarette packages and cartons has increased to one-third of the principal surfaces. A new set of pictorial health messages, occupying half of the front and back display areas, was prepared and submitted to the Ministry of Health in 2003 and is currently awaiting the approval of the Government of Thailand. Per capita cigarette consumption has been decreasing since the mid-1990s as a result of Thailand's comprehensive control policies *(16)*.

One of the most advanced mixes of population-level smoking cessation initiatives is in New Zealand, where 50% of the indigenous population are smokers *(21)*. Services include a national Quitline, subsidized nicotine replacement therapy, Maori-focused services including quitting support and therapy for Maori women and their families, and a hospital-based quitting service. Key factors in establishing programmes including cessation activities are media campaigns, an active tobacco control lobby, proactive policy analysts and a supportive government; tax increases also create incentives to help people to stop smoking.

The FCTC is a global response to the pandemic of tobacco-induced death and disease. The opening of the Convention for signature and ratification provides an unprecedented opportunity for countries to strengthen national tobacco control capacity. Success in controlling the tobacco epidemic requires continuing political engagement and additional resources at both global and national levels. The resulting improvement in health, especially of poor populations, will be a major public health achievement.

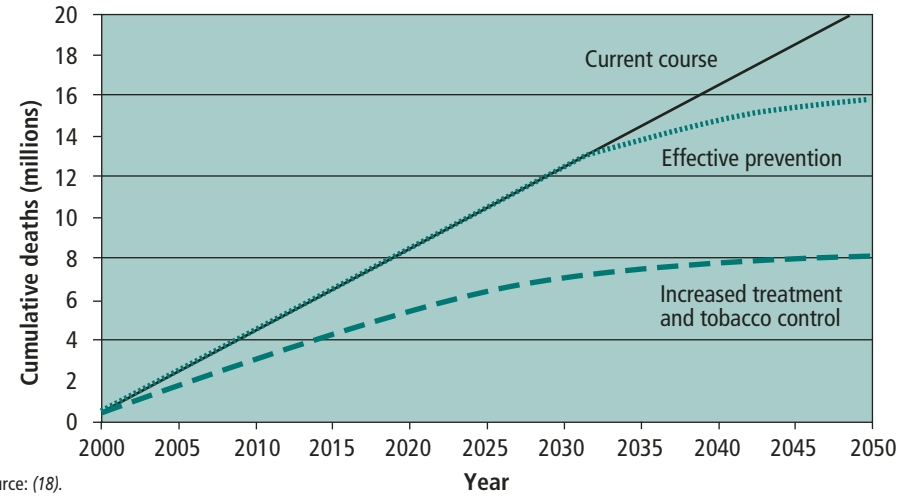
Road traffic hazards: hidden epidemics

More than 20 million people are severely injured or killed on the world's roads each year. The burden falls most heavily on developing countries, where it will grow heavier still because of the rapid increase in the number of vehicles.

In addition to the direct costs of road injuries and deaths, the increase in the number of vehicles and reliance on certain transport policies have other serious health implications as well as wider social, economic and environmental impacts *(22)*. In some countries, air pollution from road transport causes even more deaths than those resulting from traffic accidents *(23)*. Besides the direct impacts on respiratory and heart disease, motorized transport produces around a quarter of the anthropogenic emissions of gases leading to climate change *(24)*. These "hidden epidemics" receive relatively little national or international attention compared with the focus on major communicable and noncommunicable diseases.

To a large extent, road injuries are preventable. There are many available and affordable interventions that can prevent injuries and save lives: to date, most of the evaluation of these

Figure 6.2 Projected tobacco-related mortality patterns



Source: *(18)*.

interventions has been carried out in developed countries, and more research is needed on their effectiveness in developing countries. Renewed efforts are under way to increase worldwide awareness of the problem and its solutions and to encourage the introduction of road safety policies and practices. Several countries are using integrated strategies to deal with traffic risks and enhance the benefits of transport and land use policies to promote physical activity and cohesive projects for community development *(25)*.

The epidemic of road traffic injuries in developing countries is still in its early stages, but it threatens to grow exponentially unless there is swift action to counter it *(26)*. Low-income and middle-income countries already bear the brunt of 90% of the disability-adjusted life years (DALYs) lost to road traffic injuries and deaths. While fatality rates in high-income countries are declining, they are rapidly accelerating in the developing world, especially in Asia *(27)*. The problem is so severe that, by 2020, road crash injuries are likely to represent the third leading cause worldwide of DALYs lost *(28)*. By then, road traffic deaths are expected to increase by 92% in China and 147% in India, with an average increase of 80% in many other developing countries *(29)*.

In addition to the unacceptable human toll, the global economic cost of road crashes has been estimated at about US$ 518 billion annually, of which the developing country share is about US$ 65 billion *(27)*. Countries struggling for economic development clearly cannot afford such losses, which have a significant impact on national health care systems. Injuries account for approximately one-third of the acute patient load in many hospitals in low-income and middle-income countries, and between 30% and 86% of all trauma admissions *(30)*; road traffic injuries constitute the majority of such admissions.

Although more than 3000 people are killed each day, full recognition of the scale of the problem is obscured because road crashes usually cause only a few deaths at a time and generate little press coverage, contributing to the hidden nature of the epidemic of road traffic injuries.

In contrast to some other epidemics, road traffic injuries are largely influenced by decisions and choices at both policy and individual levels, which means that the problem is amenable to control. Vehicles in developing countries are known to have a far more lethal impact than those in highly motorized countries – by as much as 200-fold in some cases *(27)*. As the number of cars increases rapidly in developing countries, the roads are becoming significantly more dangerous; in the same way that the increased vehicle usage can be forecast, so can the expected deaths and injuries for vulnerable road users. A global commitment to bring

Box 6.3 Tobacco and schoolchildren in the Western Pacific Region

Alarmingly high rates of tobacco use and exposure to second-hand smoke among schoolchildren aged 13–15 years in the Western Pacific Region are revealed by data from the first group of countries within the Region to complete the Global Youth Tobacco Survey. Many of these children started smoking before the age of 10, and an overwhelming majority want to quit but are unable to do so because of nicotine addiction.

The survey involved China, Fiji, the Northern Mariana Islands, Palau, the Philippines and Singapore. It found that in some parts of China, between 20% and 40% of children started smoking before they were 10 years old, compared with 14% in the Philippines, about 22% in Fiji and Singapore, and 31–32 % in Northern Mariana Islands and Palau. Overall, between 35% and 65% had been exposed to others' smoke at home.

The desire to stop smoking was expressed by up to 87% of child smokers in China and 85% in the Philippines, and not less than 62% of all the children in the survey. These figures indicate an urgent need for interventions that target children and adolescents, to empower them to reject tobacco. For those already addicted, cessation strategies appropriate to this age group are imperative. In addition, there is a clear and pressing need for effective measures to ensure that children and young people are protected from the effects of second-hand smoke exposure. To protect children properly, WHO urges governments to establish comprehensive tobacco control programmes that adhere to the principles outlined in the Framework Convention on Tobacco Control.

this epidemic under control can succeed, but it will need intersectoral collaboration, targeted policies and national action plans. With an estimated 1.3 million fatalities each year from road traffic injuries, the opportunity of saving so many lives must be grasped.

Sharing responsibility for safety

Evidence from developed countries shows that crashes are preventable and interventions have already saved hundreds of thousands of lives. The existing data highlight the need for an approach to road safety which recognizes that the driver, the vehicle, and the built environment make up three components of a dynamic system within which safety is a shared responsibility. This approach seeks to identify all sources of error or design weakness that contribute to road traffic injuries and then tries to mitigate the consequences *(31)*.

In many developed countries, the past few decades have witnessed many improvements in safety measures for vehicles, roadways and drivers. Innovations in cars include impact-absorbing front ends, collapsible steering columns, seat belts, integral head-rests, airbags and child seats. Roadway designs have been improved to place barriers between traffic moving in opposite directions and to eliminate highway intersections. Pedestrians have been separated from vehicles by roadside barriers, street lighting has been improved, and speed bumps have been created to slow the traffic. The wearing of seat belts for drivers and passengers and helmets for motorcyclists has been made obligatory, and strict laws for speeding and drink-driving have been introduced and enforced. Hundreds of thousands of lives have been saved as a result of these measures. For example, death rates related to motor vehicles dropped in the United States by more than 40% between 1966 and 1997.

Proven cost-effective interventions in developed countries can be effective for low-income countries too. For maximum impact, all prevention strategies should be used in conjunction with effective law enforcement *(32)*.

While the data on safety interventions are compelling, existing knowledge needs to be adapted so as to underpin successful interventions in developing countries. The unique road safety circumstances of each country and region are important subjects for research. Lifestyle and other factors behind the contrasting patterns in road casualties between poor and rich countries also need to be better understood. For example, in wealthier countries, most people injured in a crash are inside the vehicle. In poorer countries, however, the majority of victims are the most vulnerable road users: pedestrians, cyclists, and passengers on public transport *(33)*.

In many countries, bicycles and motorcycles are the cheapest and most dangerous form of transport *(34)*, sharing the road with cars, buses and trucks. Cyclists, motorcyclists and their passengers are very vulnerable to speed and poor visibility, and those without safety helmets or other protection are particularly at risk. Brain injuries are a common cause of death in road crashes involving two-wheeled vehicles. The use of lights during the daytime shows promising results, as they make the cyclists and motorcylists more conspicuous.

Mobilizing action

Many political leaders are not fully aware of the magnitude and severity of road traffic injuries. Long-term awareness and advocacy campaigns are required to generate immediate and sustained action to promote global and national road safety. WHO has been increasingly involved in road traffic injury prevention in recent years. In 2001 it developed a five-year strategy for road traffic injury prevention to provide guidance to researchers, practitioners and policy-makers and to raise public awareness of road traffic injury prevention *(35)*. This

strategy, which emphasizes epidemiology, prevention and advocacy, is currently being implemented with active WHO participation in a number of countries, including Cambodia, Ethiopia, Mexico, Poland and Viet Nam.

World Health Day, which is celebrated around the world on 7 April each year, will focus in 2004 on road safety and will be marked by the launch of the *World Report on Road Traffic Injury Prevention*, to be published by WHO in collaboration with the World Bank. This report will document comprehensively the determinants and magnitude of road traffic injuries and will propose science-based evidence and solutions. In May 2003, the United Nations General Assembly recognized road injuries as a global epidemic, and a special session of the United Nations General Assembly in April 2004 is planned in conjunction with World Health Day to promote road safety and encourage countries to develop national plans. UNICEF, the United Nations Development Programme, the United Nations Department for Economic and Social Affairs, and other organizations, are also helping to raise awareness.

Country leaders and civil society should be encouraged to recognize the burden of deaths and injuries on their roads and to commit themselves to reducing it. National programmes to improve road safety will require not just participation of the public health and transport sectors, but also support from decision-makers in justice, law enforcement, health care, education and urban design sectors. In addition, governmental efforts will need support from nongovernmental organizations and professional societies.

A comprehensive assessment of each country's road safety system will identify the details of the current burden (who is injured or killed; where, when, and how the incident took place), the options for reducing that burden, the spectrum of players from different sectors that can be involved and trained, and the unique challenges within the country. The types of trained people needed to prevent and treat road traffic injuries will depend on the country's current capacity and its success in attracting additional resources.

Public health has traditionally been strong in disease surveillance: gathering and using information about the patterns, risk factors and effectiveness of interventions to prevent and mitigate a disease. Surveillance and research skills can be applied to road traffic injuries, and traditional public health assessments can be expanded to include other critical parts of the country's systems. After completing and analysing the assessment, all sectors can collaborate to develop and implement a plan to change roads, laws, vehicle designs and behaviour that will save lives. Poor countries will need outside support to build the capacity to implement road safety measures.

Injury prevention, safety and treatment

Prevention, safety and treatment are the three primary aspects of a national plan to reduce road injuries. All three components need both short-term and long-term planning and surveillance to track progress and successes. Legislation and enforcement will be essential.

The first and most important objective is to prevent a crash from happening. Some countries have already made progress in prevention by separating pedestrians from cars and trucks, creating barriers and fences, building guard-rails, widening shoulders, and eliminating "black spots" where road crashes are most likely to happen. Additional successful efforts include speed control measures such as installing rumble strips and speed bumps (see Box 6.4), enforcing speed limits and severe laws on drinking and driving *(32)*.

Second, in the event of a crash, injuries can be minimized if drivers have taken safety precautions such as wearing helmets and seat belts. Crash-resistant vehicles can be built or

imported with improved safety features such as rollover protection. Third, countries need effective trauma response systems in order to transport and treat victims without delay and to rehabilitate them. Rapid, efficient, emergency response systems can reduce morbidity and mortality. Quality rehabilitation care should be incorporated as part of a comprehensive plan to care for the injured *(36)*.

Improving road safety requires strong commitment by governments to establish, finance and sustain road safety programmes. Collaboration with other stakeholders – global, national and local – will accelerate progress and contribute to the development of more sustainable forms of public and private transport. Countries can begin with a commitment to gather more assessment data and build a comprehensive database to monitor and evaluate national plans. As the knowledge base on road traffic injuries expands, there is greater scope for collaboration between countries and across disciplines and agencies. This collaboration will be a key element in shaping a rapid response to the epidemic, especially in poorer countries, and in ensuring a reduced impact on the global environment.

Because the burden of such injuries and deaths falls disproportionately on poor countries, it is important to pursue the goal of global safety equity, in which all persons have equal access to the means of assuring safety. To achieve this, these countries will need to build infrastructure and human resource capacity, and will look to developed countries for assistance. Governments can be encouraged to view road safety and protection from injury as an important contributor to sustainable economic, social and environmental development and to mobilize the necessary forces for effective prevention of an epidemic that, while largely hidden today, will become increasingly visible unless action is taken to control it.

Integrating road safety with broader policies

In most countries, the most insidious impact of road transport is air pollution, which causes public concern in both rich and poor countries. Estimates of the impact of air pollution on health indicate that this concern is justified. In Austria, France and Switzerland the number of deaths related to air pollution from traffic is twice the number of deaths from traffic accidents *(23)*. In addition, gases that cause climate change – a quarter of which come from transport *(24)* – are expected to contribute to extreme weather events including floods and droughts, and changes in the habitat of disease vectors such as mosquitoes, with major health consequences *(37)*.

Current transport patterns have many other consequences to health *(22)*, including pervasive annoyance induced by traffic noise; adverse effects on rates of cardiovascular disease, diabetes, obesity and some cancers by discouraging the use of safe cycling and walking for transport *(38)*; and constraints on the development of neighbourhood support networks.

Box 6.4 A low-cost road safety strategy: speed bumps in Ghana

Road traffic crashes are a serious problem in Ghana, where the fatality rate per 10 000 vehicles is about 30–40 times higher than that in high-income countries. As excessive speed on interurban highways and in built-up areas has been identified as one of the key factors contributing to crashes, speed bumps have been installed at some crash-prone locations on the highways, in order to lower the speed of vehicles and improve the traffic environment for other road users such as pedestrians and cyclists. Low-cost rumble strips have been installed on the main Accra-Kumasi highway at a collision hot spot. Lower vehicle speeds reduce kinetic energy (which causes injuries and deaths on impact) as well as increasing the time to collision, thereby preventing crashes.

The use of speed bumps and rumble strips has been effective on Ghanaian roads. During the 16-month period between January 2000 and April 2001, traffic crashes were reduced by 35%, fatalities by 55% and serious injuries by 76%. These speed-reducing measures also succeeded in eliminating certain kinds of crashes and improving pedestrian safety.

These consequences have a disproportionally adverse effect on the urban poor, because urban areas have higher levels of pollution and often provide fewer options for physical activity *(39)*.

Traffic injuries are also higher among the urban poor, as they tend to live in areas of higher traffic volume – with a greater proportion of vehicles exceeding speed limits *(40, 41)*. In addition, there is a clear relationship between degree of social and economic deprivation and risk of injury in children *(42, 43)*. Reasons for these differences include the need for children of families without a car to cross a greater number of roads than children whose families own a car *(44)*. These intra-urban inequalities provide a focus for policy action: reducing health risks among the poor is a powerful tool for poverty reduction *(45)*.

Policies adopted to reduce traffic-related air pollution do not usually consider the other health impacts of traffic such as traffic crashes and injuries, and vice versa *(46)*. Health systems have an important role to play in the development of integrated transport strategies that take account of all relevant health impacts *(25)*. Health impact assessment tools[1] can be used to help visualize the expected health implications of transport policies and make suggestions on how they can be modified to maximize overall health benefits and minimize health inequalities *(47)*.

All of the subjects of the previous chapters in this report have one point in common: they represent major issues that cannot be successfully resolved without the benefit of a strong health system. The fate of the child with malaria in Africa, the middle-aged man with diabetes in Latin America, and the mother infected with HIV in Asia may all depend on the strength of their national health system. Chapter 7 finds that many such systems are sadly inadequate to cope with the challenges they face, and suggests initiatives to make them fit for the future.

[1] See web site http:\\www.who.int/hia.

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Chapter Seven

Health Systems:
principled integrated care

To meet the formidable challenges described earlier, this chapter calls for the reinforcement of health systems to be based on the core principles of primary health care as outlined at Alma-Ata in 1978: universal access and coverage on the basis of need; health equity as part of development oriented to social justice; community participation in defining and implementing health agendas; and intersectoral approaches to health. These principles remain valid, but must be reinterpreted in light of the dramatic changes in the health field during the past 25 years. Four important issues that health systems must confront are examined: the global health workforce crisis, inadequate health information, lack of financial resources, and the stewardship challenge of implementing pro-equity health policies in a pluralistic environment.

7
Health Systems:
principled integrated care

Confronting the global health challenges examined in the previous chapters requires health systems to be strengthened. Without this, the health goals described in this report will remain beyond reach. The lessons learnt from past successes, including the skills and strategies developed from the experiences of tackling polio and SARS, must be applied in combating the HIV/AIDS treatment emergency and in working towards the Millennium Development Goals (MDGs). Progress towards these and other objectives will not be sustainable unless specific health targets – including the "3 by 5" target of reaching three million people in developing countries with combination antiretroviral therapy for HIV/AIDS by the end of 2005 – support a broad horizontal build-up of the capacities of health systems.

Despite the health reforms of recent decades, inadequate progress has been made in building health systems that promote collective health improvement. Now, however, fresh opportunities are emerging. Health stands high on the international development agenda, and new funds are becoming available for health work in poor countries. Extending health-enabling conditions and quality care to all is the major imperative for health systems.

This chapter explores how the values and practices of primary health care, adapted to the realities of today's complex health landscape, might provide a basis for the improvement of health systems. It reviews basic ideas about primary health care and clarifies the concept of the development of health systems that are based on primary health care. It then examines four major challenges facing health systems: the global health workforce crisis; the lack of appropriate, timely evidence; the lack of financial resources; and the stewardship challenge of implementing pro-equity health policies in a pluralistic environment. The final section looks at how WHO is working with countries to clarify health systems goals and to strengthen systems in line with primary health care principles.

The health system comprises all organizations, institutions and resources that produce actions whose primary purpose is to improve health *(1)*. The health care system refers to the institutions, people and resources involved in delivering health care to individuals. This chapter is mostly concerned with health care systems. Nevertheless, health care providers are often involved in promoting health-enabling conditions in the community. Indeed, this relationship between patient care and public health functions is one of the defining characteristics of the primary health care approach.

The health systems performance assessment framework developed by WHO in the late 1990s was an attempt to put into effect the primary health care concern for equity and population health outcomes, by providing analytical tools to translate these concerns into relevant

evidence. The framework drew the attention of policy-makers to issues such as the catastrophic health expenditure in a number of countries. Although this report does not directly apply the framework, it assumes that policy-makers will use this and other relevant tools to measure the success of an approach to health systems scale-up based on primary health care.

Valuable knowledge has been gained in recent years about how health systems work and why they fail. Initiatives such as the European Observatory on Health Care Systems are producing important insights (see Box 7.1), though fundamental questions remain unresolved. This report does not propose a complete model of the development of health systems based on primary health care, which would be impossible given the current state of evidence. The aim is to open lines of enquiry that will be of use to countries and international health partners as they weigh options and take action to strengthen systems, making them responsive to the needs and demands of all, especially the poor.

The core principles of primary health care

Primary health care became a core policy for WHO in 1978, with the adoption of the Declaration of Alma-Ata and the strategy of "Health for all by the year 2000". Twenty-five years later, international support for the values of primary health care remains strong. Preliminary results of a major review suggest that many in the global health community consider a primary health care orientation to be crucial for equitable progress in health *(2)*.

No uniform, universally applicable definition of primary health care exists. Ambiguities were present in the Alma-Ata document, in which the concept was discussed as both a level of care and an overall approach to health policy and service provision. In high-income and middle-income countries, primary health care is mainly understood to be the first level of care. In low-income countries where significant challenges in access to health care persist, it is seen more as a system-wide strategy.

Box 7.1 The European Observatory on Health Care Systems

Countries in the European Region – diverse in terms of language, history and wealth – have an array of approaches to the organization of health systems. The European Observatory on Health Care Systems and policies seeks to disseminate information on more than a decade of change, analysing the reforms and generating evidence on what works in different contexts and why. It ensures that Europe's national policy-makers can set their own experiences in the European context and make comparisons across borders, draw on thematic and comparative analysis of the key challenges they face, and have access to clear, practical evidence.

The Observatory is a partnership that brings together the WHO Regional Office for Europe, governments (Greece, Norway and Spain), international and nongovernmental agencies (the European Investment Bank, the Open Society Institute, and the World Bank) and academia (the London School of Economics and Political Science and the London School of Hygiene and Tropical Medicine). All the Observatory's materials are available on its web site.[1]

Information and monitoring. The Health System in Transition series of 70 country profiles provides analytical answers to a standard set of questions and uses clear definitions to create a baseline of information, drawing attention to what is distinct about a particular country. The Observatory covers the whole European Region and some additional OECD countries, to allow systematic comparisons and the review of reforms over time.

Analysis. The Observatory produces comprehensive studies on key health system and policy areas, including hospitals, funding, regulation, European enlargement, social health insurance, purchasing, primary care, pharmaceuticals, mental health, human resources, and targets. It uses secondary or meta-analytical research, bringing together experts from across Europe to synthesize existing findings, to work country experiences into a conceptual framework and to draw out practical lessons and options.

Dissemination. Engaging with policy-makers and their advisers helps ensure they can use the information and analyses generated. The Observatory runs seminars and workshops for small groups of high level policy-makers, often in partnership with agencies supporting health system and policy reform, on matters such as funding options, the implications of EU accession for new Member States, or equity.

[1] www.observatory.dk.

It is useful to understand primary health care as involving both core principles and a variable set of basic activities. For the purposes of this discussion, it is the principles that are most significant *(3)*, including:

- universal access to care and coverage on the basis of need;
- commitment to health equity as part of development oriented to social justice;
- community participation in defining and implementing health agendas;
- intersectoral approaches to health.

Enduring principles in a changing environment

The global, national and local environments in which primary health care values must be translated into action have changed fundamentally in the past 25 years. Key demographic and epidemiological shifts include ageing populations, the explosion of HIV/AIDS, and the expanding double burden of diseases in low-income and middle-income countries (see the example in Box 7.2). Advances in health technology have transformed many aspects of medical practice and raised expectations concerning the types of functions and services that health systems should provide.

The institutional context of health policy-making and health care delivery has also changed. Government responsibilities and objectives in the health sector have been redefined, with private sector entities, both for-profit and not-for-profit, playing an increasingly visible role in health care provision. The reasons for collaborative patterns vary, but chronic underfunding of publicly financed health services is often an important factor. Processes of decentralization and health sector reform have had mixed effects on health care system performance *(4)*.

The ideas and activities associated with primary health care have themselves undergone changes. In the 1980s, the approach termed "selective primary health care" gained favour. By focusing on the technical challenges of delivering limited basic interventions in poor areas, this strategy encouraged "vertical" programme structures. These programmes produced

Box 7.2 Primary care in a changing environment: the "health houses" of the Islamic Republic of Iran

The Government of the Islamic Republic of Iran has invested strongly in training health care providers. Primary health care facilities, popularly known as "health houses", provide an active network staffed by community health workers, or *behvarzes*, who are trained and regularly supervised by staff from district health centres. The *behvarzes* provide basic care and advice on many aspects of maternal and child health and common communicable diseases. They also record local health information through the "vital horoscope" data system, which includes information collected during annual household visits. This system provides valuable information for planning services both locally and nationally. There are high levels of community involvement in the delivery of community-based health care; 90% of the population belongs to a health insurance scheme, and some schemes are explicitly designed to protect the poor.

Today, the Islamic Republic of Iran faces several challenges to maintaining these achievements in a changing environment. The country's epidemiological profile has changed, partly as a consequence of the success of the strategy led by primary care. The major burden of disease is attributable to noncommunicable diseases and injuries, though there are some differences between richer and poorer provinces. Urbanization is increasing, with an associated change in lifestyle. The private health sector is increasing. Clinical case management is often not as evidence-based as it could be. A recent study on health financing demonstrated that the financing system is not as equitable as had been thought: out-of-pocket payments are high, and the poor are less well protected from catastrophic health expenditures than they were previously.

The government is moving to respond to these new challenges. It is already beginning to reorient the primary health care activities delivered in health houses. Technical guidelines for interventions and training for different cadres of health worker are being reviewed as part of an effort to improve quality of care. There are discussions about a common benefit package, what it should include and by whom it should be provided; specifically, how to involve private providers more effectively in the delivery of critical interventions, both preventive and curative, for example through contracting. The different insurance schemes are being reviewed within a broader analysis of overall health system financing, and there are debates about what sort of organizational arrangements within the public sector would enhance the quality and efficiency of public providers.

important gains, for example in immunization coverage and child mortality reduction, but were at odds with the comprehensive vision of primary health care developed at Alma-Ata, notably its emphasis on tackling the socioeconomic determinants of ill-health. In the 1990s, the World Bank recommended a set of core public health interventions and a package of essential clinical services influenced by primary health care models, though critics questioned whether these strategies responded adequately to the messages of equity and community participation delivered at Alma-Ata *(5)*.

Originally, primary health care and the health-for-all movement represented an effort to change practices and structures in the health sector based on population health criteria. Subsequent health sector reform efforts have often been steered by criteria largely extrinsic to health (for example, broad commitments to decentralization or civil service reform, or the need to reduce government spending). Reaffirmation of primary health care principles by global health stakeholders signals a recognition of the need to return to population health criteria as the basis for decisions affecting how health care services are organized, paid for and delivered.

Principles in a systems perspective

This report reinforces an important conceptual shift towards the model of health systems based on primary health care. In a systems perspective, the potential conflict between primary health care as a discrete level of care and as an overall approach to responsive, equitable health service provision can be reconciled. This shift emphasizes that primary health care is integrated into a larger whole, and its principles will inform and guide the functioning of the overall system.

A health system based on primary health care will:
- build on the Alma-Ata principles of equity, universal access, community participation, and intersectoral approaches;
- take account of broader population health issues, reflecting and reinforcing public health functions;
- create the conditions for effective provision of services to poor and excluded groups;
- organize integrated and seamless care, linking prevention, acute care and chronic care across all components of the health system;
- continuously evaluate and strive to improve performance.

Intervention across the disease continuum is needed to achieve the comprehensive care envisaged by such a system. To deal with the increasing burden of chronic diseases, both noncommunicable and communicable, requires upstream health promotion and disease prevention in the community as well as downstream disease management within health care services. Two integrated health care models, the chronic care model and its extension – WHO's innovative care for chronic conditions framework – promote primary health care concepts: intersectoral partnerships, community participation and seamless population-based care. Evidence supports the use of these integrated models as a means of implementing primary health care principles, with demonstrated reduction in health care costs, lower use of health care services, and improved health status *(6–9)*.

Linking expanded HIV/AIDS treatment and health care systems development is a crucial challenge. No blueprint exists, but valuable examples are emerging. Since May 2001, Médecins Sans Frontières has provided antiretroviral therapy for HIV/AIDS through primary health care centres in the township of Khayelitsha, South Africa *(10)*. The delivery of HIV/AIDS treatment in a primary health care setting underscores the potential for integration of different types of care and begins to show how scaling up treatment could fit into – and help drive

– an overall strengthening of health care systems based on primary health care principles. The Khayelitsha antiretroviral programme uses a nurse-based service model and relies on strong community mobilization for peer support. It has shown that HIV/AIDS treatment can be rolled out most effectively if:

– the entire health system is mobilized and HIV/AIDS treatment activities are integrated into the basic package of care;
– treatment services are decentralized to ensure coverage and community involvement;
– treatment and care are part of a "continuum of care" supported by a facility-linked home-based care system and a referral system.

The additional resources that must flow into countries' health sectors to support HIV/AIDS control efforts, including "3 by 5", can be used in ways that will strengthen health systems horizontally. Developing context-specific strategies to achieve this will be part of WHO's technical collaboration with countries. Similarly, if the recommendations of the Commission on Macroeconomics and Health for large increases in global investment in health are followed by the international community, the coming years will offer a crucial opportunity for development of health systems that are led by primary health care.

Enormous obstacles to the scale-up of health systems based on primary health care persist. In some countries, violent conflicts and other emergencies have seriously damaged health systems (see Box 7.3). Multiple forms of inefficiency undermine systems, such as government health expenditure disproportionately devoted to tertiary care and programmes that do not focus on a significant burden of disease *(11)*. Lack of financial resources remains a fundamental problem. Total health expenditure is still less than US$ 15 per capita in almost 20% of

Box 7.3 Rebuilding Iraq's health sector

The Gulf War of 1991 and the economic sanctions marked the start of the decline of a health care delivery system that had been a model for the region during the 1980s. Health indicators dropped to levels comparable to some of the least developed countries: in 1996, infant, child, and maternal mortality rates were estimated at 100/1000, 120/1000, and 300/100 000 live births, respectively, a twofold increase over 1990 levels. The Oil for Food programme brought a relative improvement of the health of Iraqi people, although still far from pre-1990 levels. Health outcomes are now among the poorest in the region.

Iraq is below the regional average in terms of physicians to population (5.3 doctors per 10 000 population in 2002); there are too many specialists but too few primary health doctors and nurses. Following the 2003 war, the health infrastructure, which had suffered from years of disrepair, was further weakened by the widespread looting, inadequate electricity and water supply, and institutional instability.

The pre-2003 war health system was hospital-based and driven by curative care, and did not respond adequately to health needs. The challenge for Iraqi policy-makers and the donor community is to re-establish basic services in the short term while transforming the inefficient and inadequate health services to a system based on primary care, prevention, and evidence-based policy. The new system should tackle the disease burden faced by Iraq's people and be affordable within the available envelope of public finance.

Major challenges face the health sector: limited capacity of the Ministry of Health (and health directorates in governorates) to undertake essential public health functions; lack of a package of health services that includes catastrophic care in the event of emergency and diagnostic and laboratory facilities; external brain drain of human resources; lack of an information system for informed decisions at the policy and implementation levels; inadequate financial resources and unclear mechanisms for smooth flow of funds to meet the investment and operational costs of the system; and the need for improved coordination among all stakeholders in health to optimize donated resources.

Senior staff from the Ministry of Health, officials from the Coalition Provisional Authority, and representatives of organizations of the United Nations system, nongovernmental organizations and donors met in Baghdad in August 2003 to determine immediate and medium-term priorities to enable the health sector to provide health services that are accessible, equitable, affordable and of adequate quality.

Re-establishing the functioning of the health sector to pre-war levels requires funds for salaries and other priority recurrent expenditure. It is estimated that Iraq's financial requirements for health services in 2004 – from government and donor sources – will be in the order of US$ 0.8–1.6 billion (or US$ 33–66 per capita). Assuming a sustained and increasing income, the projections for the period 2004–2007 are in the range of US$ 3.7–7.8 billion, which at the end of the period translate into a per capita public expenditure of US$ 40–84. Forecasting economic performance, fiscal capacity and donors' willingness to sustain Iraq for the period 2004–2007, however, is an exercise fraught with difficulties.

WHO Member States. In many countries, especially the poorest, people in need of treatment for themselves or their families still pay for the bulk of health services out of pocket.

All efforts to improve health care systems in developing countries must confront several main challenges: workforce development and retention; health information management; financing; and government stewardship within a pluralistic health landscape. The remaining sections of this chapter consider these topics. Systems face difficulties in numerous other areas as well, but all four of these problems demand urgent action in order to scale up the system to meet health targets. If constraints in these areas are not overcome, little progress will be made in improving access to care among the poorest.

The global health workforce crisis

The most critical issue facing health care systems is the shortage of the people who make them work. Although this crisis is greatest in developing countries, particularly in sub-Saharan Africa, it affects all nations. It severely constrains the response to the AIDS treatment emergency and the development of health systems driven by primary health care, even as AIDS reduces the available workforce. Botswana's commitment to provide free antiretroviral therapy to all eligible citizens is frustrated, not by financing, but by the severe lack of health personnel *(12)*.

Unfortunately, workforce issues are still considered to be relatively unimportant by both national governments and international agencies. Rapid and substantial strengthening of the workforce is urgently required to capitalize on the funds and pharmaceuticals that are now available.

The health workforce crisis has to be confronted in an economic and policy environment very different from that of 25 years ago. Traditional models in which the government directly recruits, trains, hires and deploys health professionals no longer reflect the reality of most developing countries. Most countries have undergone decentralization and reforms of the civil service and the health sector. There has been a great expansion in the health care roles of nongovernmental organizations and private providers. Furthermore, all countries are now part of the global marketplace for health professionals, and the effects of the demand–supply imbalance will only increase as trade in health services increases *(13)*. Accordingly, new models for health workforce strengthening must be developed and evaluated *(14)*.

Size, composition and distribution of the health workforce

The number of health workers in a country is a key indicator of its capacity to scale up delivery of interventions. This crisis is nowhere greater than in sub-Saharan Africa, where limitations on staffing are now recognized as a major constraint to achieving national health goals and the MDGs *(15)*. In Chad and the United Republic of Tanzania, for example, the current workforce is grossly insufficient for the extensive delivery of priority interventions *(16)*. Countries facing such extreme personnel shortages urgently need a rapid increase in the numbers of health workers to perform key tasks, particularly the delivery of services at community level in underserved areas.

The number of health workers in a country is not the only determinant of access to primary health care. Figure 7.1 shows that the number of births at which skilled attendants are present is only partially related to the number of health professionals in a country.[1] Guinea, Indone-

[1] The term "health professionals" is defined for the WHO database as including physicians, nurses, midwives, dentists and pharmacists.

sia and Paraguay have similar workforce numbers but wide differences in the level of coverage. This is caused by several factors, including the skill mix of health workers, their geographical and functional distribution, and their productivity. These data indicate the importance of using the existing workforce more effectively.

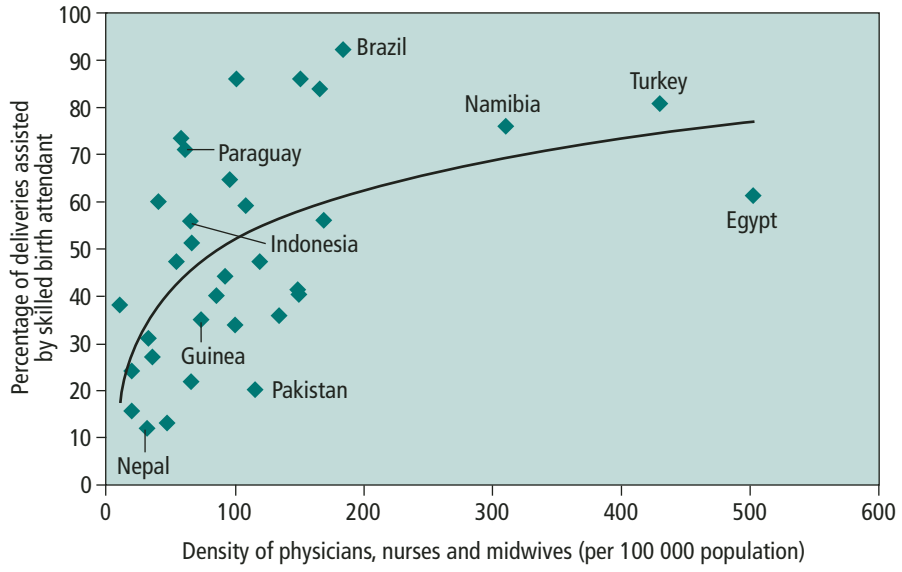
Gender discrimination in the health professions has many serious implications for the long-term strength of the health care system and especially for the delivery of services to poor and disadvantaged populations. A specific issue concerns the under-representation of women among those who manage and direct services, even though most health care workers are women. For example, in South Africa, men represent only 29% of personnel in administration overall, but they occupy 65% of all senior management posts *(17)*. Without proper representation at the managerial and leadership levels, women's needs as employees within the health system will continue to be neglected. More generally, workforce policy and planning must consider gender and life-cycle issues, not only out of concern for equity, but also to enable efficient and effective development of a health care system that responds to and meets the particular needs of women.

Workforce training

Meeting urgent health challenges while laying stronger foundations for health systems requires that health planners consider the composition of the health workforce in terms of training levels and skill categories. In developed countries, experimentation with new categories of health worker is a response to cost-containment and quality of care concerns. In developing countries such experimentation is a direct response to limited supply.

To achieve the goals associated with health care systems driven by primary health care, new options for the education and in-service training of health care workers are required so as to

Figure 7.1 Relationship between births accompanied by skilled attendants and number of health professionals,[a] 33 developing and transition countries



[a]WHO/UNICEF latest estimates.

ensure a workforce more closely attuned to country needs. Training of students from developing countries at high-prestige institutions in developed countries is useful only when there is no local or regional alternative. Although there are about twice as many nursing schools as medical schools worldwide, in the African Region there are 38 nursing schools and 64 medical schools. This suggests that too many expensive health workers are produced in places that might have a greater need for new types of providers with an education more focused on primary health care. The public health workforce also needs strengthening, based on a new approach to in-country or regional training that emphasizes the management of health problems at the district level *(18)*.

The workforce of doctors is often complemented by training nurse practitioners, "assistant medical officers" and mid-level professionals. These categories are health professionals who can assume many of the responsibilities previously reserved for those with a full medical degree (see Box 7.4). For example, many studies in developed countries show that nurse practitioners can reduce the costs of care without harming, and sometimes actually improving, health outcomes *(21, 22)*. In the Pacific Islands, mid-level practitioners, with various titles such as medex, health assistant, or health officer, play an important role in meeting curative and preventive needs, especially in remote or rural areas *(23)*. In other countries, community health workers are trained in very specific and high-priority activities, making it possible to serve populations that are out of the reach of formal health care services.

In the past, primary health care strategies based on community health workers or other alternative health care providers have been difficult to sustain *(24)*. However, evidence suggests that such strategies can be effective, given appropriate training *(25, 26)*. To be successful, the creation of new types of health worker requires that they be valued for their distinctive contribution, rather than treated as second-class providers. This means offering them career development prospects, rotation to and from rural and underserved areas, good working conditions, the chance to work as a team with other professionals, and an adequate salary. New cadres can be seen not only as a pragmatic response to current shortages, but as a cohort whose skills can be continually upgraded through in-service training, leading in the longer term to their incorporation in the more highly qualified professional categories. Evidence is growing that community members can carry out a wide range of health care tasks, including treatment of more complex conditions (*10, 25–28*).

Migration of health workers

Policy-makers in all countries are concerned about "brain drain" of the health workforce within and between countries, although relevant research is still in its infancy *(29)*. The movement of health professionals closely follows the migration pattern of all professionals. While

Box 7.4 Training assistant medical officers: the *técnicos* of Mozambique

In 1984, a three-year programme was initiated to create assistant medical officers (*técnicos de cirurgia*) to perform fairly advanced surgical procedures in remote areas where consultants were not available *(19)*. The programme trains middle-level health workers in skills required for three broad priority areas: pregnancy-related complications, trauma-related complications and emergency inflammatory conditions. Two years of lectures and practical sessions in the Maputo Central hospital are followed by a one-year internship at a provincial hospital, under the direct supervision of a surgeon.

Forty-six assistant medical officers were trained between 1984 and 1999, and the evaluation of their influence on quality of care is promising. For example, a comparison of 1000 consecutive caesarean sections conducted by *técnicos de cirurgia* with the same number conducted by obstetricians or gynaecologists indicated that there were no differences in the outcomes of this type of delivery or in the associated surgical interventions *(20)*. Many countries have now started or are considering similar programmes, based on their claimed cost-effectiveness. The potential impact of this type of health worker on both quality and efficiency of health care must continue to be evaluated.

doctors and nurses make up only a small proportion of professional migrants, their loss weakens health systems.

The internal movement of the workforce to urban areas is common to all countries. Within a region, there is also movement from poorer to richer countries, for example from Zambia to South Africa or from the United Republic of Tanzania to Botswana. The most controversial "brain drain" is international professional migration from poorer to wealthier countries *(30)*. While the departure of doctors receives the most attention, it is the departure of nurses and other health professionals that can easily cripple a health system. Nurses are in high demand in developed countries, partly because of population ageing. Some efforts have been made to promote ethical practices in international recruitment, but results have yet to be assessed *(31)*.

Workforce mobility creates additional imbalances just when increased financial resources are beginning to flow to some developing countries. This requires better workforce planning in developed countries, attention to issues of pay and other rewards in developing countries, and improved management of the workforce in all countries.

Paying more and paying differently

Raising wages may increase the number of health workers and their productivity and may succeed in countries where health workers are paid less than comparable professions. It may be less successful, however, in countries where health sector wages are higher than those of comparable professions. Wages take the single largest share of health expenditure, so increases have to be carefully evaluated for their impact both on the availability and productivity of health workers and on aggregate budgets. The role of public sector unions in negotiating with governments for pay increases is an additional complexity.

As well as raising salaries, other strategies to improve productivity include non-financial benefits such as housing, electricity and telephones, on-the-job training with professional supervision, and opportunities for rotation and promotion. In rural Senegal, providing nurses with motorcycles not only made it possible to increase immunization coverage but also improved their access to technical support and reduced their isolation *(32)*.

Both financial and non-financial incentives can also reduce geographical imbalances in the distribution of health workers. For example, in Indonesia, a bonus of as much as 100% of the normal salary attracted medical graduates from Jakarta to the outer islands *(33)*. Recruitment and training of people from remote areas, who are committed to their region of origin, have also been proposed.

Finally, nongovernmental organizations concerned with health and private providers are a large and increasing presence in most countries. Governments could consider partnerships in which the public sector provides financial support and the nongovernmental organizations manage and provide the direct services. Often, private health workers are available in places that the public sector finds difficult to reach. In such situations, establishing formal programmes either to contract private providers or to reimburse the services they provide may be the most pragmatic response. In the mid-1990s, the Government of Guatemala was obliged to expand health care services to unserved populations as part of the negotiated peace agreements that took place at the time. It contracted more than 100 nongovernmental organizations to provide basic health care services to some 3 million of the country's citizens, predominantly indigenous and rural people, who previously had no access to services *(34)*. Recently, Cambodia has successfully experimented with contracting nongovernmental organizations and private providers to deliver basic services to underserved groups *(35)*.

Improving quality: workers and systems

All health systems need to create an environment for effective team learning for quality improvement. While the quality of care depends to some extent on the individual characteristics of health care workers, levels of performance are determined to a far greater extent by the organization of the health care system in which they work. Many health care organizations are moving from a practice of blaming individual health care workers for deficiencies to a culture of team learning and shared quality improvement.

Recognizing that the quality of health care is fundamentally a system issue is the first step towards making improvements in processes and outcomes of care. System-level quality improvements require a clear definition of optimal care and a framework for changing the system. Essential components of optimal care include decision support tools for health care workers, with written care guidelines and diagnostic and treatment algorithms; and necessary supplies, medical equipment, laboratory access and medications. Also needed are clinical information systems (which can be computerized or paper-based), guidelines for planned visits and active follow-up, and systematic support to patients for self-management of their conditions and referral to community resources. Evidence suggests that health systems with strong, integrated primary care are associated with better outcomes, probably because they provide for more comprehensive, longitudinal and coordinated care *(36)*.

There is also a requirement for a method that will enable health care workers to make improvements *(37)*. Health care teams should be able to develop and test changes in their local settings, which will enable them systematically to make improvements in processes of health care. One such method is the model for improvement *(38)*, which enables rapid testing and evaluation by health care teams of potential improvements in their work. Working together in groups of teams helps communication and spreads innovations to larger groups *(39, 40)*.

Box 7.5 Creating a skilled workforce for tomorrow

The process of building a motivated workforce with the relevant skills can begin immediately, using existing budgets and staff. These activities also require continuous investments of time and leadership, and the involvement of health workers and communities in planning and managing their own futures.

Immediate actions that should be taken include: mobilizing communities and community workers; engaging traditional healers and enlisting volunteers; raising productivity among current health workers through improved supervision and support; and assessing and obtaining feedback on quality of practice.

Reorienting managerial staff to new functions takes time and planning. This process includes:

- developing and implementing on-the-job training to upgrade skills;
- contracting with the private sector and nongovernmental organizations;
- introducing flexible new contract opportunities for part-time work; improving working conditions with better drug distribution and supply of other essential medical supplies;
- strengthening collaboration among health workers, traditional healers, volunteers and community members.

Preparing for changes to institutions, policies and legislation requires undertaking studies and analyses that need to be started immediately. Design, approval and implementation of the changes, however, need time and will have an impact in the medium term. Some actions in this category include:

- developing pay and non-pay incentive packages to improve staff recruitment and retention;
- developing a plan to improve training capacity and management practices;
- coordinating donor contributions to workforce development; designing and implementing safety guidelines, clinical protocols, and anti-discrimination policies to improve working conditions;
- building extensive partnerships with civil society.

Urgent problems require urgent action. Governments must not lose sight, however, of the long-term requirements of the health system. While tackling more urgent activities, governments can lay the foundations for effective workforce policies, by:

- analysing the labour market, relative wages and supply trends so as to be able to design appropriate recruitment, retention, and wage policies;
- developing long-term plans for achieving appropriate mixes of skills and geographical distribution of health care professionals;
- expanding opportunities for management training and for the improvement of management practices;
- developing strategies for strengthening the relationship between public and private providers and financing.

Responding to the workforce crisis

Taking action to meet the workforce crisis is not easy and requires paying attention to all areas of workforce needs, from training to morale, and from local to global determinants. WHO has a major advocacy role in building and sustaining awareness of the extent of the crisis.

Some actions can be taken immediately, others require more time and planning (see Box 7.5). In the most urgent circumstances, for example scaling up HIV/AIDS treatment, countries can mobilize community resources, volunteers and traditional healers to collaborate in expanding access to primary health care (see Box 3.2 in Chapter 3). Health care workers' productivity can be improved through better supervision, support and morale-building. In the short term, governments can initiate programmes that mobilize nongovernmental and private sector resources by contracting the delivery of services, upgrading staff skills, and making sure that workers have the drugs and medical supplies they need to do their job.

In the medium term, governments can bring in changes requiring more planning, reorientation of administrative staff, and changes in budgeting such as pay policies, non-pay incentives, and expanded training capacities. New guidelines and policies can be adopted. Collaboration with communities and local governments can be deepened. Important lessons can be learnt from country experiences, whether very successful or less so *(14)*. Policy-makers may suggest that any proposed new project or policy include a formal "human resources impact assessment" during its preparation; international agencies and donors could also be brought into this process *(41)*.

Finally, governments should keep sight of the conditions necessary to motivate and sustain good health service delivery. This means taking the dynamic nature of labour markets seriously, and recognizing the long-term limits and expectations of health care workers. It also means establishing more clearly the expected roles of public and private providers in a future system of universal coverage. WHO is actively working with countries to develop long-term and short-term solutions. An example from the Region of the Americas is provided in Box 7.6.

Box 7.6 The Observatory of Human Resources in Health Sector Reforms

The Observatory is a cooperative initiative promoted by the Pan American Health Organization/WHO Regional Office for the Americas. Its goals are to produce and share knowledge among the countries of the region to support human resources policy decisions and improve workforce development in the health services sector.

The initiative supports the creation of national inter-institutional groups (for example, ministries of health, universities, and professional associations) to collect information on the stock of human resources for health and to analyse imbalances and trends, to prioritize an agenda of issues to be tackled, and to advise on long-term and medium-term policy development. Nineteen countries participate in the initiative, with different emphases and priorities, according to national concerns. The networking efforts are geared to making the country experiences applicable in other contexts, through construction of databases and dissemination of lessons learnt. The main lessons to date are as follows:

- The Observatory is a way to improve the stewardship role of ministries of health in human resources.
- The inter-institutional Observatory groups can help to maintain the human resources agenda during the transition between administrations.
- There is a need to integrate key stakeholders: universities, ministries of health, and professional associations, even though there may be substantial conflicts between them.
- Evidence needs to be developed from more reliable and stable statistical sources (for example, the International Labour Organization and household surveys).
- New approaches should be found to use the information in shaping policies (for example, to improve geographical distribution and to correct public–private imbalances).

General information about the network, its meetings and useful links can be found at http://observatorio_rh.tripod.com/.

Health information: better but not good enough

The evolution of health information

Shortages of adequate health information, as well as shortages of personnel, contribute to the potential collapse of some health care systems and threaten the long-term viability of others. Health care systems oriented to primary health care principles need robust health information components in order that the health needs of populations, especially those that are poor and marginalized, can be understood; to ensure that programmes are reaching those most in need; to measure the effects of interventions; and to assess and improve performance. As noted above, tools and structures for obtaining, organizing and sharing information are vital for improving the work of individual health care providers and raising the quality of care throughout the system.

The amount of information available to health policy-makers and planners at the time of the Declaration of Alma-Ata on primary health care was limited. The main sources of population-based health information were vital registration, censuses, national surveys, and research studies. Information was generated through routine reporting at facility level. However, data were rarely collated and used at national level, and feedback mechanisms from central to local levels were missing.

Substantial progress has been made since then in the field of health information. An increasing volume of data has become available on health status, health services utilization, and determinants of health through population-based health interview surveys. Many countries now have good data, disaggregated by sex, on levels and trends in child mortality, coverage of selected health interventions, and incidence and prevalence of certain diseases. They often have some limited information on equity in health. However, many critical gaps remain. Levels of adult mortality are poorly measured in most populations and accurate cause-of-death data are not generally available. Morbidity is inadequately measured for most conditions. Coverage and costs of many interventions are not monitored properly and insufficient information is available to monitor equity satisfactorily. The quality of health information is often highly variable and poorly documented. There is little standardization across definitions and methodologies.

Critically, the use of health information for the management of health services at the local level and for health policy-making and planning at the national level remains limited. Very few countries have developed effective and efficient health information systems that take into account the needs of different levels of users, from local to national and global levels. Much of the information collection and analysis is driven by vertical health programmes, often in the context of international initiatives, and integration is lacking.

An information system driven by primary health care

In the context of health systems driven by primary health care, a health information system can be defined as an integrated effort to collect, process, report and use health information and knowledge to influence policy-making, programme action, and research.

Health information systems use a range of data collection and analysis tools and methods. Accurate and continuous statistics on basic demographic events are a foundation of rational health and public policy. National vital registration systems (considered the "gold standard") currently cover less than one-third of the world's estimated mortality. Significant regional disparity exists, ranging from over 90% of all mortality coverage in the European Region to

less than 10% coverage in the South-East Asia and African Regions *(42, 43)* (see Table 7.1). Trends in coverage are slowly improving. Considerable effort has been devoted to developing less expensive and more accurate alternatives to national routine death certification, such as sample registration systems and survey-based or census-based questions on sibling deaths or deaths in the household. When used alone or with accompanying vital registration systems, sampling can improve coverage of events where resources are limited. These systems have been introduced in China and India, to take two examples, and are applicable to other resource-poor settings (see Box 1.1 in Chapter 1).

Population-based household surveys have become the major source of health information. Much of the information generated by surveys is based on self-reporting, raising issues of reliability, validity and cross-population comparability. In the field of morbidity and evaluation of interventions, there is an urgent need to consider a much larger and broader investment in biological and clinical data collection in surveys *(44)*. In most countries, equity considerations are still not fully integrated into health information systems.

Health information can be used for at least four distinct but related purposes: strategic decision-making, programme implementation or management, monitoring of outcomes or achievements, and evaluation of what works and what does not. Strategic decision-making by health policy-makers should be based on the best available evidence. Data from vital registration systems, epidemiological studies, household surveys, censuses, and health service providers often give highly uncertain information about the true population value of a health indicator. Assessments of any health indicator should be based on the integration of all relevant information and the use of criteria such as internal consistency and prior knowledge of disease history to improve estimates from uncertain or inconsistent data.

In addition to the routine use of models to estimate life tables in areas where vital registration systems do not attain high rates of coverage, estimates of the incidence, prevalence and mortality of diseases increasingly use explicit models to derive best estimates from uncertain, incomplete or contradictory population data. The focus has been on the national, regional and global levels, although estimates for local areas, including districts, are increasingly becoming available.

The problems and weaknesses of routine health service statistics are well known *(45)*. Several countries have now made progress in developing routine health information systems, including the use of better technology, mapping, and focusing more extensively on local user needs. The introduction of new technology in a well-designed system allows better surveillance of key diseases and also more accurate and timely programme monitoring.

Improving information systems

In recent years, significant attempts have been made to reform health systems as a whole, with increasing attention given to the decentralization of resources and decision-making to district level. Such reforms entail the need for better health information systems at local level. At the same time it has been increasingly understood that local individuals and families have to be involved in the generation, dissemination and use of health informa-

Table 7.1 Availability of death registration data – number of countries by WHO region

Region	Usable data	Complete coverage	Total countries
Africa	4	1	46
Americas	32	14	35
South-East Asia	4	0	11
Europe	48	39	51
Eastern Mediterranean	7	4	22
Western Pacific	22	8	27
Total	**117**	**66**	**192**

tion. Involving people in the planning and implementation of health care was a fundamental principle of Alma-Ata and still has important implications for the way that health information systems operate.

Equity in health is another of the key principles of primary health care. This requires the ability to measure inequalities in access to and use of health services, risk factors, and key health outcomes. It also means identifying which groups of people are the most disadvantaged – often poor people, ethnic groups or women. This type of information imposes a considerable additional burden on health information systems and is not routinely available in many countries. Surveys are currently the most important method of collecting information on the equity dimension of health, but much more work is needed to integrate equity monitoring into health information systems, both with surveys and with other methods of data collection and analysis. The aim of the World Health Survey, launched by WHO in 2001, is to provide valid, reliable and comparable data on population health and health system performance, through a household survey. The programme emphasizes monitoring the MDGs and critical outcomes among poor populations.

Improvement in health information systems is needed at local, national and international levels, and more integration between these levels is required to deal with global health threats and the growth of knowledge (see Box 7.7). Countries will benefit greatly if health information systems are based on a national plan with a framework, indicators, and data collection, analysis and dissemination strategies. The strategic plan should also be specific about how the different tools and methods will be applied and complement each other, how health information needs are met at the subnational, national and global levels, and what kind of investments are needed. The latter include human resources, infrastructure (technology, laboratories, etc.), and operational budgets for health data collection efforts. National bodies

Box 7.7 Reliable and timely information for health

The Health InterNetwork (HIN), led by WHO, is an initiative of the United Nations Millennium Action Plan to meet the information needs of health professionals, researchers and policy-makers in developing countries.[1] Since it began in September 2000, HIN has improved health by using the Internet to enhance the flow of health information, focusing on content, Internet connectivity, and capacity building.

HIN provides a vast online health library to personnel in government departments, teaching and research institutions, and other non-profit organizations. International agencies, national organizations and the academic and private sectors are contributing content, and HIN is working with local partners to publish local health information. The five priority content areas are: scientific and biomedical journals, education and training resources, information for health policy and practice, statistical data, and public health software for public health and clinical management.

During its first year, HIN achieved a major breakthrough in the provision of health content. Through an agreement reached by WHO with the world's major biomedical publishers, over 2200 medical and scientific publications are now available online to public and non-profit institutions in 113 developing countries. HIN's Access to Research Initiative (HINARI) is making the journals available online free of charge or at greatly reduced rates, based on a country's ability to pay.

HIN's second phase is providing the up-to-date information needed to educate and upgrade the skills of the health workforce. It includes online courses and references covering public health, medicine and nursing, as well as specialized topics for developing country practitioners.

Health personnel need easy, reliable and affordable access to the Internet if they are to use it in their work. Infrastructure and cost are important obstacles, and Internet use is limited outside many capitals where power sources are unreliable and service providers are rare. HIN India was developed to test the logistics, cost and partnership models for improving the flow of information with remote areas. It has established Internet access sites in hospitals, clinics, research and educational institutes and public health facilities in two states. Local partners played a key role by supplying, installing and maintaining computer hardware and software, and in establishing Internet connections. Capacity building is essential, and HIN provides training materials that institutions use to ensure that health workers, policy-makers and researchers have the skills needed to find, use and share public health information online.

Well-documented, successful strategies to bridge the digital divide in health information remain the exception rather than the norm. In the words of a tuberculosis programme coordinator in the field in India: "without computers and the Internet, we are fighting 21st-century health problems with 19th-century tools".

[1] Web site: www.healthinternetwork.net.

with participation of stakeholders of different levels of users and technical experts need to guide and oversee the implementation of the national plans.

The Health Metrics Network

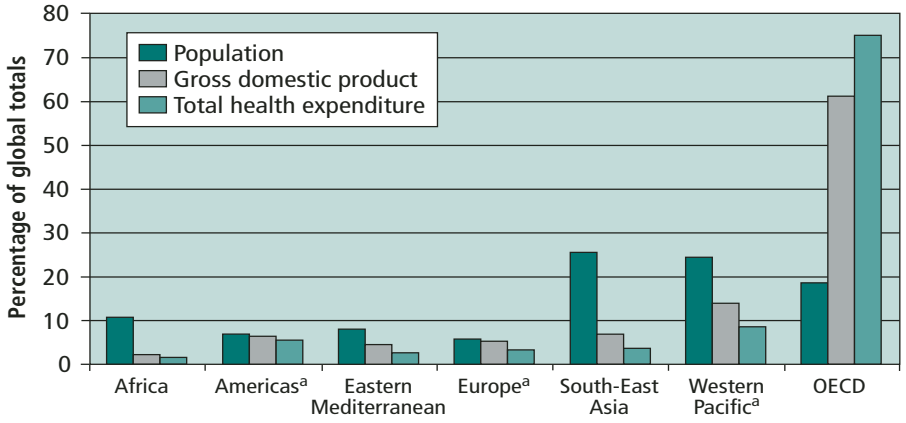
The strengthening of these systems requires a collaborative effort. The Health Metrics Network, to be launched in 2004, will focus on improvements to the availability and utilization of reliable health information for policy-making and planning, programme monitoring and evaluation, monitoring of international goals, and measuring equity in health. Through the collaboration of many partners, and with careful planning and establishment of clear targets, the Network aims to strengthen the capacity of health information systems to provide high quality, timely information in a form that is useful for public health work at the national, subnational and global levels. It is a broad partnership that includes WHO, other international organizations, bilateral agencies, foundations, ministries of health, statistical organizations, academic institutions, and organizations representing civil society. This kind of network is necessary to enhance the efficiency and effectiveness of the assistance provided by investors in health information. The Health Metrics Network partnership should also be able to accelerate development and scaling-up of innovations in monitoring and evaluation of health status and health programmes. Standardization and enhancement of methods to assess quality of health information will greatly assist the measurement of progress towards achieving global goals such as the MDGs.

Financing health systems

Many of the functions of health care systems depend on adequate financing. If sustainable financing mechanisms are not put in place, innovative ideas for strengthening the primary health care base of health care systems will not yield results.

Globally, health spending has grown substantially over the last 25 years, driven largely by rapid changes in technology and increasingly complex institutions for financing and delivering care. Yet in the world's poorest countries, health spending has grown slowly, if at all. Consequently, there is great inequality in global health spending today (see Figure 7.2). Countries of the Organisation for Economic Co-operation and Development accounted for less

Figure 7.2 Inequality in health spending and incomes by region, 2001



[a] Regions from which the OECD countries have been subtracted.

than 20% of the world's population in the year 2000 but were responsible for almost 90% of the world's health spending. The African Region accounts for about 25% of the global burden of disease but only about 2% of global health spending (see Annex Tables 4 and 5).

While spending levels have changed, the options for financing health systems have not. In 1978, WHO discussed the same financing sources that are being debated today, namely general taxation, earmarked taxes, social security, community-based financing, fees, and external assistance *(46)*. Applied policy studies are still lacking, however. For example, a recent review of 127 studies on community health insurance schemes found that only two of them had sufficient internal validity to enable conclusions to be drawn regarding the impact on utilization and financial protection *(47)*. Without reliable information, health financing policies continue to be dominated by opinions rather than evidence.

Developing sustainable financing

Policy decisions about financing mechanisms have multiple effects. They influence how much money can be mobilized, how equitably those resources are raised and applied, and the efficiency of the resulting services or interventions. The context within which health financing operates will significantly alter its effects. However, the principles for improving health financing are essentially the same everywhere: reduce the extent to which people have to make large out-of-pocket payments at the point of service; increase the accountability of institutions responsible for managing insurance and health care provision; improve the pooling of health fund contributions across rich and poor, healthy and ill; and raise money through administratively efficient means. The key policy questions relating to health financing are very different, however, in rich and poor countries. Thus, the following discussion will consider high-income, middle-income, and low-income countries separately.

In high-income countries, with per capita incomes above US$ 8000, resources for health are relatively plentiful though not necessarily equitably distributed. An average of 8% of national income is spent on health. Among these countries, annual health spending ranges from US$ 1000 to more than US$ 4000 per capita. The issues that dominate discussions of health financing relate largely to the effectiveness of spending, cost containment and equity.

In middle-income countries, with per capita incomes between US$ 1000 and US$ 8000, resources are more constrained and health services are less widely accessible. Countries in this category spend between 3% and 7% of national income on health, representing an annual expenditure of between US$ 75 and US$ 550 per capita. In these countries, the health financing system is often a critical obstacle to making health interventions accessible to all. Frequently the population is segmented between those in government or formal sector employment who benefit from relatively well-financed health insurance schemes, and those who rely on more poorly funded ministry-run services or pay out of pocket for private care. Many of these countries, notably in Asia, mobilize very little through the public sector.

In low-income countries, with annual per capita income of less than US$ 1000, health financing discussions are dominated by the fundamental constraint of too few resources. In most of these countries, only 1–3% of gross domestic product is spent on health and, because their per capita income is so low, this translates into health spending per capita of between US$ 2 and US$ 50. Even if these countries spent 10% of their income on health services, the investment, if spread equitably across the population, would suffice only for very rudimentary health care.

Public policy should not allow fees at point of service to become an obstacle for obtaining necessary care, or become a catastrophic financial burden on households. In practice,

policies on fees depend on the population's capacity to pay, its impact on utilization, the kinds of services being provided, and the impact of fees on the quality and availability of services. In cases where service quality can be maintained or improved, eliminating fees may increase access. This appears to be the recent experience in Uganda, where user fees were eliminated because the government simultaneously increased its financial and managerial support. In cases where service quality cannot be maintained or improved by other means, fees can provide critical incentives and resources to keep services available. This appears to have been the experience with the Bamako Initiative when the retention of fees helped to ensure the availability of drugs even if other programmes were ineffective *(48)*. Therefore, public policy toward fees must be pragmatic, based on full consideration of the context and the net impact on the population's access to good-quality health services.

Sustaining the health system without relying heavily on fees requires the mobilization of other sources, including general and earmarked taxes, social insurance contributions, private insurance premiums, or community insurance prepayment. In practice, the use of particular sources will depend on the population's capacity to pay, administrative capacities to collect, the kinds and quality of services that are made available, and the effectiveness of existing institutions and forms of financing.

In low-income countries, general taxation is a very attractive way to build a strong public role in health service delivery, because it is administratively easier to manage than more complex insurance or regulatory arrangements. Nevertheless, general taxation only works if the tax base is broad, tax administration is effective, and funds are allocated to health services and used well. If any one of these factors is missing, the more effective alternative may be to establish an independent social insurance administrator or encourage the formation of community insurance programmes. Pragmatism is a useful guiding principle in finding ways to mobilize and apply resources to improve health.

Unblocking system bottlenecks

Much progress has been made in rationalizing the choice of priority interventions since the time of the standard "minimum package" of the early 1990s. New tools are now available. For example, the WHO-CHOICE project is a database on the health impact and costs of a large number of health interventions – preventive, promotive, curative and rehabilitative *(49)*. Prioritizing cost-effective interventions is all the more important as new funds become available to the health sector. Care must be taken to ensure that external funding is additional to, and not a substitute for, domestic financing, but also that financing which flows from outside sources does not lead to (further) fragmentation of the national health system.

New funds remove only one of the obstacles to equitable, universal health care provision. Institutions receiving increased funds, whether governmental or nongovernmental, must improve programme implementation. Trained staff, information systems, audit mechanisms, and financial controls must be strengthened to handle the increased financial flow.

Thus, while resource mobilization remains a challenge, the results-driven allocation of resources also requires new strategies. Effective management of the new funds now becoming available to the health sector, particularly in sub-Saharan African countries, requires innovative approaches to medium-term budgeting. Solutions must be found to loosen the system bottlenecks – in human resources and other areas – that make it difficult to translate more money into better health outcomes. One promising approach is Marginal Budgeting for Bottlenecks, based on work in a number of west African countries. As ministries of health develop their medium-term expenditure plans, system bottlenecks need to be clearly identified

and strategies for unblocking them costed. The approach has produced encouraging results in Mali and Mauritania and is now set to be implemented in several Indian states *(50)*.

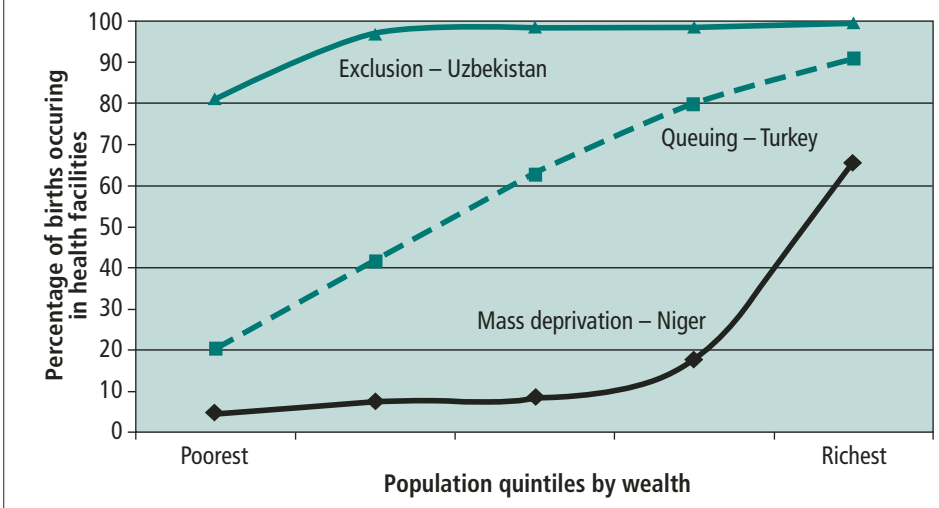
Pro-equity health systems: government's central role

If a key responsibility of the health system is to narrow health equity gaps – a fundamental principle of primary health care – then a criterion for evaluating strategies in workforce development, health information, financing strategies and other areas must be the degree to which these strategies are pro-equity.

The mutual reinforcement of poverty and ill-health is increasingly well understood, and there is growing evidence of how unequally and inequitably resources, efforts and outcomes are distributed. Benefit incidence studies consistently show that people living in poverty receive less than a proportional share of public funding for health, relative to the better-off *(51–55)*. Income is not the only relevant factor. Poverty is fundamentally a condition in which individuals lack the capacities required to satisfy their needs, fulfil their aspirations and participate fully in society *(56)*. Hence, the lack of political empowerment and education are factors in the exclusion of people from health care. Gender, racial and ethnic discrimination contribute significantly to inequities in health and in access to health care services.

Policies that improve a country's aggregate health indicators are not necessarily fair or pro-equity. Where countries have succeeded in improving health outcomes and reducing inequity, health system development policies have had to "swim against the tide", explicitly countering the bias to serve the better-off first *(57–60)*. Whatever the specific configuration of a country's health sector, effective stewardship of the whole health sector by the government – including supervision, monitoring and enforcement of health policies – is vital, if pro-equity outcomes are to be achieved *(61)*.

Figure 7.3. Distribution patterns of health care deprivation, Uzbekistan, Turkey and Niger



Patterns of inequitable access to care

Pro-equity health care strategies will vary by context. The key difference concerns the pattern of inequitable access to care, which takes three distinct forms. In the poorest countries, the pattern can be characterized as mass deprivation – the majority of the population has equivalent but deficient access to health care services while a small privileged class finds ways to obtain the care it needs. In somewhat better-off countries, such inequities can be described as queuing – general access to health services is better, but middle-income and upper-income groups benefit most, while poorer groups must wait for a "trickle down" effect. In some countries, inequities take the form of exclusion whereby the majority of the population has reasonable access to services, but a poor minority of the population is deprived. These patterns can be visualized by considering the percentage of births that occur in a health facility (as a proxy for general access to health services) by income quintile (see Figure 7.3).

The manner in which systems based on primary health care develop will vary across these differing contexts. In some cases, programmes targeted at specific population groups are urgently needed to achieve pro-equity outcomes. In other instances, broad strengthening of the whole system is the priority. These two approaches can also be combined.

In countries characterized by exclusion, targeting will probably be needed to combat social inequality and inequality in access to health services. Such a strategy might apply to middle-income and low-income countries such as Chile and Uzbekistan, but it is also appropriate in wealthier countries in which marginal populations remain excluded from otherwise universal services because of discrimination by race, ethnicity or gender, income poverty, or social stigmatization. Progress will not take place without government action, either through the provision or payment of services, or the design of appropriate incentives to the nongovernmental sector. Examples of targeting include recent efforts in Chile and New Zealand to make health services more culturally appropriate and accessible to indigenous populations *(62)*, as well as an Australian programme to strengthen primary health care among the indigenous people of the Tiwi Islands (see Box 7.8).

Three types of targeting strategies have been commonly used: direct, characteristic and self-targeting. They are not mutually exclusive and are, in fact, often employed in combination. Direct targeting seeks to provide benefits only to the poor. One approach is to waive the cost

Box 7.8 Community health reforms in the Tiwi Islands

The remote Tiwi Islands are located 60 km north of the Australian coast in the Arafura Sea, with a population of over 2000 consisting mainly of indigenous people. Unemployment is high and housing conditions are generally of low quality. Very high rates of chronic conditions have been recorded, especially diabetes and renal and respiratory tract conditions. In 1997, the Australian Commonwealth and Territory governments negotiated with the community-based Tiwi Council to reform existing primary health care services, through a Coordinated Care Trial with four broad objectives:

- to achieve Tiwi community control of health services, through the establishment of an area health board to administer pooled health sector funds;
- to improve the effectiveness of preventive measures based on local participation in community programmes;
- to improve the quality and effectiveness of health services, through the use of increased resources for a mix of primary coordinated care and population-based health services;
- to improve the standard of care according to best practice guidelines and protocols.

The trial ran for three years. Health outcomes could not be measured in this short phase, but process measures of success were achieved *(63)*, including:

- community control, by the establishment of the Tiwi Health Board, which now determines health policy and expenditures;
- increased community awareness of health issues among Tiwi islanders, and greater community input into service delivery;
- improved prevention services, especially those tackling urgent local problems;
- increased number and improved quality of primary health services;
- reduction in avoidable hospitalization.

of care for individuals who cannot afford to pay. Implementing this strategy requires means testing (assessment of the patient's financial capability). Waivers reliant on means testing demand substantial administrative capacity. Governments can also make direct conditional cash transfers to poor families to reward household behaviour change, such as bringing children to health centres for regular check-ups. Again, this requires considerable institutional capacity. In parts of Latin America, such approaches have increased participation in preventive health care *(64)*.

Characteristic targeting attempts to benefit particular groups of poor people based on specific attributes that cause further deprivation. Criteria can include geographical location, gender, ethnicity, particular diseases (for example, HIV/AIDS), or other factors. Self-targeting relies on the better-off to opt out of services perceived to be of low quality. Such services may involve greater waiting time or a poorer service environment.

Countries and areas characterized by the queuing pattern of inequitable health care access include Turkey and the wealthier states and provinces of China and India. In such settings, pro-equity policies have to find the right balance between efforts to build on and expand the existing institutions of health care, effectively reducing the barriers that lead to queuing, while identifying and targeting those groups that would otherwise be excluded without special attention. Again, active government participation is required.

In 2001, Thailand began a programme to extend universal health insurance coverage to those without access to health services. Under the new programme, dubbed the "30 baht health plan", people register as patients with local health care providers and can then obtain all needed medical care for a co-payment of 30 baht (about US$ 0.35). The system is financed jointly from taxes and contributions by workers and employers, while health care providers are reimbursed on a capitation basis. The programme is not without its problems, but still represents a bold effort to confront health inequities *(65)*. Another successful attempt to expand coverage to the poor was the health insurance reform in Colombia in the mid-1990s. Between 1995 and 2001 the number of contributors to the mandatory health insurance system was expanded from 9.2 to 18.2 million people. At the same time, the system was reformed so as to explicitly cross-subsidize the poor and unemployed. In 1995, 3 million people benefited from these cross-subsidies; by 2001 their number had grown to 11 million. Thus, millions of non-contributing individuals gained access to roughly the same package of benefits as those who made the contributions, in the public or private facility of their choice, and in the same way as those more affluent citizens who regularly contribute *(66, 67)*.

Countries with mass deprivation represent the greatest challenge of all. In such countries, most of the population is deprived of health care, with only the richest able to buy it. To speak of "targeting" in such circumstances is not useful. The main effort is best characterized as "scaling up", meaning overall extension and strengthening of the health system. Countries in this category need rapid expansion of outreach and extension of primary care facilities and hospitals, along with increased investments in other sectors such as education, water and sanitation. Redressing geographical and rural–urban imbalances can often go a long way towards accelerating progress in these countries. But the limited scale of public resources also requires innovations that build on and support local and community participation and the activity of the nongovernmental sector, as implied by the principles of primary health care.

Some innovative approaches have succeeded in extending health care to poor people despite resource, infrastructure and workforce constraints. In its Expanded Programme on Immunization, Bangladesh for example, used outreach programmes in rural areas and enlisted the active nongovernmental sector for service provision in urban areas to effectively bridge both

the infrastructure and human resource gap *(68)*. Scaling up was combined with prioritizing service delivery to rural areas and the poor and, as a result, considerable advance was made in reducing infant mortality rates. However, this intervention could not be accompanied by a complementary increase in attended births as this requires a very different approach to service delivery – infrastructure requirements are greater as are the required facility staff skills. Both of these necessitate substantial additional resources as well as the capacity to use them effectively. This underscores the point that, while responsible government stewardship is vital to pro-equity health improvement, major gains cannot be achieved in countries confronting mass deprivation without substantially increased international support.

The goal: universal access

An approach to the development of health care systems driven by primary health care must aim at universal access to quality health care services. Speeding the historical movement towards universal coverage will ensure that general health systems improvement does not mask – or contribute to – widening health inequalities.

There are many obstacles to this goal, including limitations in financial resources, education and skilled personnel. But strong stewardship plays a significant role in dealing with these constraints. How rapidly countries advance towards universal coverage depends on whether governments accept a situation in which health benefits gradually trickle down from the rich to the poor, or whether they accelerate actions to ensure a fair distribution of health care resources and benefits to all social groups.

Government stewardship, community involvement

Responsible health sector oversight and pro-equity commitments by the state are essential to building and maintaining health systems based on primary health care. However, governments must engage with and respond to communities in a two-way relationship if they are to perform their stewardship role effectively. Community involvement – including the dimensions of participation, ownership and empowerment – is a key demand-side component of the health system, necessary to promote accountability and effectiveness.

The Declaration of Alma-Ata acknowledged the importance of community involvement in defining health objectives and implementing strategies. The declaration affirmed that "people have the right and duty to participate individually and collectively in the planning and implementation of their health care" *(3)*. However, the concept of community participation was not easy to put into practice. In some cases, such participation emerged as a crucial factor in improving the performance of health systems. At community-owned health centres in Mali, for example, the fact that communities paid the salaries of health centre staff led to dramatic changes in the way nurses related to their clients *(69)*. In a Sudanese village, a community-driven project has generated income and strengthened social capital – with positive implications for health (see Box 7.9). However, all too often "community participation" has been limited to setting up health committees that acted as vehicles for cost recovery. Indeed, in some countries in west Africa, the term "community participation", applied in the health field, became synonymous with "co-payment".

Recent years have seen a move away from narrow definitions of community and community participation (through health committees, for example) to a wider view based on the involvement of civil society organizations. Such organizations are highly diverse. They may manage or co-manage health facilities (as the Federation of Community Health Associations does in Mali), promote self-help and self-reliance, act as champions of forgotten or excluded

groups (as in the case of organizations of people living with HIV/AIDS), or practise consumer protection (like Thailand's Consumer Foundation).

One of the key roles of civil society organizations is to hold health care providers as well as governments accountable for what they do and how they do it. Where civil society is active, organizations can monitor government policy choices and practise advocacy. As stewards of the health system, ministries of health are responsible for protecting citizens' health and ensuring that quality health care is delivered to all who need it. This requires making the best choices given the available evidence, and systematically privileging the public interest over other competing priorities. This responsibility ultimately rests with governments, even in a context of decentralization where lines of accountability may be blurred. Yet without mechanisms enabling people to hold officials accountable, stewardship may falter. To enable effective pressure for accountability, accurate information about health and health systems performance is required throughout civil society. Government should make such information public and accessible. The Mexican Secretariat of Health, for example, has published a comprehensive, user-friendly overview of the country's state of health and of the performance of the health system *(70)*. Civil society groups themselves, in their watchdog function, also generate and share information for accountability. This has been the case with Thailand's National Forums for Health Care Reform *(71)*.

When the right structures are in place, effective governance and vigorous community involvement support each other. Participatory budgeting in Porto Alegre, Brazil, offers an example of consensus building with the community in what is usually a mainstream government activity. Initiated in 1988, the process is now substantially consumer driven, with the implementing agency accountable to its clients. Matching expenditure allocations to needs expressed by the community has produced measurable improvements in access to social services *(72)*.

Box 7.9 Building partnerships for health in Sudan

The Sudanese Basic Development Needs (BDN) programme was introduced in 1998 in Kosha, a remote village in Northern State with a population of around 2500. A needs assessment survey undertaken there showed multiple social, economic and health problems. A great majority of households had no latrines and 99% of the population used water directly from the river. Many pregnant women suffered miscarriages perhaps because of the strain of carrying water. Poor sanitation and hygiene resulted in many health problems, especially diarrhoeal diseases, malnutrition and eye infections. Vaccination coverage for children and mothers was very low and there was little practice of family planning methods, although the fertility rate was among the highest in the country. Most of the people were extremely poor and unemployment was very high.

Shortly after the introduction of the BDN programme, significant changes were recorded in the lives of this population. The community itself has rehabilitated the health centre, financially supported the medical assistant, and adopted self-financed community health insurance through the community development fund. All households now have access to safe water indoors, and over 60% of houses have sanitary latrines. This has resulted in a marked improvement of health indicators and a reduction in common diseases (diarrhoea, acute respiratory infections, malaria and dysentery), increased coverage of vaccination and antenatal care, and a reduction in the malnutrition rate to less than 1%.

The participation of local people in these matters has produced other positive changes: the enrolment of girls and boys in school has increased and adults have also participated in informal literacy classes; a nursery school has been established; and the youth social club has been renovated. Moreover, a women's committee has been formed to initiate and support activities related to development of women's status. The income of a majority of families has greatly increased through the cultivation of vegetables and fruit trees, with the assistance of small loans from the village development committee. The village now has electricity, enabling the community to acquire television and satellite for evening entertainment. In addition to WHO, the community has managed to build strong partnerships with UNICEF, UNFPA, the Government of the Netherlands, the Canadian International Development Agency, local government and many nongovernmental organizations.

The success of Kosha village has inspired five neighbouring villages to organize themselves, without any intervention from the national programme. Two of these villages have already completed the baseline survey and the training of community organizations using their own resources. The population of Kosha village itself is confident that it can continue to make improvements in health and quality of life through sustained self-help and self-reliant interventions.

Realizing genuine community involvement requires overcoming numerous obstacles. Two issues are particularly constraining. First, communities, especially poor rural ones, may be unaware of the mechanisms for involvement. Second, relatively wealthy and more influential social groups can often dominate political processes at community level, again particularly in rural areas. When the better-off are allowed to "represent" the whole community in planning and implementation discussions, relatively affluent groups can absorb benefits at the expense of poor groups. Both these patterns restrict the capacity of poor people to participate fully in processes designed to foster community involvement in the health system. Implementing policies to overcome these obstacles is a key aspect of government stewardship in health.

Building systems based on principles: WHO cooperation with countries

The health goals described in this report will not be met without significant strengthening of health systems in low-income and middle-income countries. This applies to achieving the MDGs, scaling up HIV/AIDS prevention and treatment, managing the double burden, and the other key health objectives.

There are numerous ways in which health systems strengthening could be undertaken and systems development priorities set. This chapter has proposed that countries' efforts to build up their health systems in the coming years should be guided by the values of primary health care. It has argued that, despite sweeping changes in the global health policy environment over the past quarter-century, the core principles of primary health care remain valid.

Even greater challenges lie in the future for health systems. In the years ahead, environmental change will affect population health in ways not yet understood. Health systems are already grappling with the effects of economic globalization, including migration and the impact of trade patterns and practices on population health. As issues such as intellectual property rights and trade in services continue to be debated in international forums, health systems will face new pressures. In this context, resolute commitment to the primary health care values of equity, universal access to care, community involvement and intersectoral action will be more important than ever.

This chapter has begun to investigate how a health systems effort based on primary health care might confront key challenges in workforce development and retention, information management, health financing, and pro-equity stewardship. Clearly, however, this investigation must be carried further. Much remains to be understood about how health systems function, why they fail or respond slowly to some crises, and about how primary health care principles can be translated into practical policies that will yield health improvements for communities. Intensified research and information sharing on health systems must be high on the agenda of the global health community.

Promoting health systems research is an element of WHO's programme for more effective cooperative work with countries. WHO will also work closely with countries to exploit fully current health systems knowledge and the results of ongoing research. The priorities for this work include:

- strengthening the quality of policy research and improving international access to current evidence about the effectiveness of primary health care models and interventions;
- building new networks to facilitate the sharing of best practices and experience;

- developing a coherent "programme of work" for primary health care that effectively integrates all levels of WHO;
- improving communication and collaboration with other international agencies to avoid sending contradictory messages on health systems development;
- developing an evaluative framework and a review process that will help Member States to review existing primary health care policies and plan any necessary changes *(2)*.

Above all, WHO's commitment with respect to health care systems based on primary health care is to move the Organization's focus as rapidly as possible from advocating principles to supporting practical application through technical cooperation with Member States. Current global consultations on primary health care will provide opportunities for sharing evidence and comparing country experiences. The urgency of global health challenges demands that this knowledge be turned speedily into action for health systems improvement based on primary health care.

The commitment to cooperation with countries on health systems development is part of a broader change in WHO's way of working. At a time when new challenges need to be met with new responses, WHO is altering its approach and redirecting its resources. The Organization is reinforcing its technical collaboration and support for people in governments, the private sector and civil society who are engaged in health work. This support will come from all levels of WHO and will be displayed in specific country cooperation strategies. Strengthening WHO's presence in countries and intensifying country-level collaboration is the best way for the Organization to accelerate progress towards the goals that unite the global health community: measurable health improvements for all, and vigorous strides to close equity gaps.

This report began by describing the contrasts that characterize global health. An approach based on primary health care recognizes the need to attack the roots of health disparities intersectorally. Hence the importance of the MDGs, and the global compact on which the goals are founded. The health sector can make the most effective contribution to the attainment of the MDGs, HIV/AIDS treatment targets and other objectives by strengthening health care systems. Working together to build effective, responsive, pro-equity health care systems, WHO, Member States and their partners will shape a more just, more secure and healthier future for all.

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Statistical Annex

The six tables in this technical annex present updated information on summary measures of population health, mortality and the burden of disease in WHO Member States and regions, and selected national health accounts aggregates for 1997–2001. Life expectancy and healthy life expectancy estimates and the national health accounts aggregates have been revised to take new data into account and, for many Member States, are not directly comparable with those published in *The World Health Report 2002*. The work leading to these annex tables was undertaken mostly by the WHO Global Programme on Evidence for Health Policy in collaboration with counterparts from WHO regional offices and representatives of WHO in Member States. Where data are presented by country, initial WHO estimates and technical explanations were sent to Member States for comment. The estimates reported here should, however, still be interpreted as being the best estimates of WHO rather than the official viewpoints of Member States.

Statistical Annex
Explanatory notes

The tables in this technical annex present updated information on summary measures of population health, mortality and the burden of disease in WHO Member States and regions, and selected national health accounts aggregates for 1997–2001. Life expectancy and healthy life expectancy estimates and the national health accounts aggregates have been revised to take new data into account and, for many Member States, are not directly comparable with those published in *The World Health Report 2002*. The work leading to these annex tables was undertaken mostly by the WHO Global Programme on Evidence for Health Policy in collaboration with counterparts from WHO regional offices and representatives of WHO in Member States. These notes provide an overview of concepts, methods and data sources together with references to more detailed documentation.

It is hoped that careful scrutiny and use of the results will lead to progressive improvements in the measurement of health attainment and health system financing in future editions of *The World Health Report*. The main results in the health attainment tables are reported with uncertainty intervals in order to communicate to the user the plausible range of estimates for each country on each measure. Where data are presented by country, initial WHO estimates and technical explanations were sent to Member States for comment. Comments or data provided in response were discussed with the Member State and incorporated where possible. The estimates reported here should, however, still be interpreted as being the best estimates of WHO rather than the official viewpoints of Member States

Annex Table 1

To assess overall levels of health achievement, it is crucial to develop the best possible assessment of the life table for each country. New life tables have been developed for all 192 Member States starting with a systematic review of all available evidence from surveys, censuses, sample registration systems, population laboratories and vital registration on levels and trends in child mortality and adult mortality *(1)*. This review benefited greatly from a collaborative assessment of child mortality levels for 2001 by WHO and UNICEF and from analyses of general mortality by the United States Census Bureau *(2)* and the United Nations Population Division *(3)*.

All estimates of population size and structure for 2002 are based on the 2002 demographic assessments prepared by the United Nations Population Division *(3)*. These estimates refer to the de facto population and not the de jure population in each Member State. To aid in

demographic, cause-of-death and burden-of-disease analyses, the 192 Member States have been divided into five mortality strata on the basis of their level of child and adult male mortality. The matrix defined by the six WHO regions and the five mortality strata leads to 14 subregions, since not every mortality stratum is represented in every region. These subregions are defined on pages 184–185 and used in Tables 2 and 3 for presentation of results.

Because of increasing heterogeneity of patterns of adult and child mortality, WHO has developed a model life table system of two-parameter logit life tables using a global standard, and with additional age-specific parameters to correct for systematic biases in the application of a two-parameter system *(4)*. This system of model life tables has been used extensively in the development of life tables for those Member States without adequate vital registration and in projecting life tables to 2002 when the most recent data available are from earlier years.

Demographic techniques (Preston–Coale method, Brass Growth–Balance method, Generalized Growth–Balance method and Bennett–Horiuchi method) have been applied, as appropriate, to assess the level of completeness of recorded mortality data for Member States with vital registration systems. For Member States without national vital registration systems, all available survey, census and vital registration data were assessed, adjusted and averaged to estimate the probable trend in child mortality over the past few decades. This trend was projected to estimate child mortality levels in 2002. In addition, adult sibling survival data from available population surveys were analysed to obtain additional information on adult mortality.

WHO uses a standard method to estimate and project life tables for all Member States with comparable data. This may lead to minor differences compared with official life tables prepared by Member States. Life expectancies for the year 2002 for many Member States have been revised from those published for 2000 and 2001 in *The World Health Report 2002* to take into account more recently available mortality data.

To capture the uncertainty resulting from sampling, indirect estimation technique or projection to 2002, a total of 1000 life tables have been developed for each Member State. Uncertainty bounds are reported in Annex Table 1 by giving key life table values at the 2.5th percentile and the 97.5th percentile. This uncertainty analysis was facilitated by the development of new methods and software tools *(5)*. In countries with a substantial HIV/AIDS epidemic, recent estimates of the level and uncertainty range of the magnitude of the epidemic have been incorporated into the life table uncertainty analysis.

Annex Tables 2 and 3

Causes of death in the 14 subregions and the world have been estimated based on data from 112 national vital registration systems that capture about 18.6 million deaths annually, representing one-third of all deaths occurring in the world. In addition, information from sample registration systems, population laboratories and epidemiological analyses of specific conditions has been used to improve estimates of the cause-of-death patterns *(6–16)*. These data are used to estimate death rates by age and sex for underlying causes of death as defined by the International Statistical Classification of Diseases and Related Health Problems (ICD) classification rules.

Cause-of-death data have been carefully analysed to take into account incomplete coverage of vital registration in countries and the likely differences in cause-of-death patterns that would be expected in uncovered and often poorer sub-populations. Techniques to

undertake this analysis have been developed based on the global burden of disease study *(17)* and further refined using a much more extensive database and more robust modelling techniques *(18)*.

Special attention has been paid to problems of misattribution or miscoding of causes of death in cardiovascular diseases, cancer, injuries and in general ill-defined categories. A correction algorithm for reclassifying ill-defined cardiovascular codes has been developed *(19)*. Cancer mortality by site has been evaluated using both vital registration data and population-based cancer incidence registries. The latter have been analysed using a complete age, period cohort model of cancer survival in each region *(15)*.

Annex Table 3 provides estimates of the burden of disease for the 14 epidemiological subregions using disability-adjusted life years (DALYs). One DALY can be thought of as one lost year of "healthy" life and the burden of disease as a measurement of the gap between the current health of a population and an ideal situation in which everyone in the population lives into old age in full health *(20, 21)*. DALYs for a disease or health condition are calculated as the sum of the years of life lost (YLL) through premature mortality in the population and the years lost through disability (YLD) for incident cases of the health condition. DALYs for 2002 have been estimated using cause-of-death information for each subregion and regional or country-level assessments of the epidemiology of major disabling conditions. For this report, burden-of-disease estimates have been updated for many of the cause categories included in the Global Burden of Disease 2000 study, based on the wealth of data on major diseases and injuries available to WHO technical programmes and through collaboration with scientists worldwide *(16)*. These data, together with new and revised estimates of deaths by cause, age and sex, for all Member States, have been used to develop internally consistent estimates of incidence, prevalence, duration and DALYs for over 130 major causes, for 14 subregions of the world. WHO programme participation in the development of these estimates and consultation with Member States ensures that estimates reflect all information and knowledge available to WHO. Estimates of incidence and point prevalence for selected major causes by subregion are also available on the WHO web site at www.who.int/evidence/bod.

Annex Table 4

Annex Table 4 reports the average level of population health for WHO Member States in terms of health-adjusted life expectancy (HALE). HALE is based on life expectancy at birth (Annex Table 1) but includes an adjustment for *time spent in poor health*. It is most easily understood as the equivalent number of years in full health that a newborn can expect to live based on current rates of ill-health and mortality *(22, 23)*.

The methods used by WHO to calculate HALE have been developed to maximize comparability across populations. WHO analyses of more than 50 existing national health surveys for the calculation of healthy life expectancy identified severe limitations in the comparability of self-reported health status data from different populations, even when identical survey instruments and methods were used *(24)*. These comparability problems are a result of unmeasured differences in expectations and norms for health, so that the meaning different populations attach to the labels used for response categories in self-reported questions (such as mild, moderate or severe) can vary greatly *(25)*. To resolve these problems, WHO undertook a Multi-Country Survey Study (MCSS) in 2000–2001 in collaboration with Member States, using a standardized health status survey instrument together with new statistical methods for adjusting biases in self-reported health *(25, 26)*.

The MCSS carried out 71 representative household surveys in 61 Member States in 2000 and 2001 using a new health status instrument based on the International Classification of Functioning, Disability and Health *(27)*, which seeks information from a representative sample of respondents on their current states of health according to seven core domains. To overcome the problem of comparability of self-report health data, the WHO survey instrument used performance tests and vignettes to calibrate self-reported health in each of the core domains *(26)*. The calibrated responses are used to estimate the prevalence of different states of health by age and sex. Building on the findings from the MCSS, WHO is now carrying out the World Health Survey, in collaboration with Member States (further details are available from the WHO web site at www.who.int/evidence/whs). During the first half of 2003, 73 Member States conducted the World Health Survey, and its results will contribute to future analysis of healthy life expectancy.

The measurement of time spent in poor health is based on combining condition-specific estimates from the Global Burden of Disease 2000 study with estimates of the prevalence of different health states by age and sex derived from the MCSS, and weighted using health state valuations *(28)*. Data from the Global Burden of Disease 2000 study were used to estimate severity-adjusted prevalences for health conditions by age and sex for all 192 WHO Member States for 2002. Data from 62 surveys in the MCSS were used to make independent estimates of severity-adjusted prevalences by age and sex. Finally, posterior prevalences for all Member States for 2002 were calculated using prevalences based on the Global Burden of Disease 2000 and the survey prevalences.

Household surveys including a valuation module were conducted in 14 countries: China, Colombia, Egypt, Georgia, India, Indonesia, the Islamic Republic of Iran, Lebanon, Mexico, Nigeria, Singapore, Slovakia, the Syrian Arab Republic and Turkey. Data on nearly 500 000 health state valuations from over 46 000 respondents were used to develop average global health state valuations for the calculation of HALE *(29)*.

The methods used by WHO to calculate healthy life expectancy were peer-reviewed during 2001 and 2002 by the Scientific Peer Review Group (SPRG) established by the Director-General in response to a request by the WHO Executive Board. The SPRG's final report to the Director-General *(30)* stated that the methodology for the measurement of HALE was well advanced, and made a number of technical recommendations which have been followed with regard to the calculations reported in Annex Table 4. In particular, steps have been taken to include residents in health institutions, and dependent comorbidity. The MCSS survey samples did not include older people resident in nursing homes or other health institutions. Because these people generally have worse health than those resident in households, an adjustment was made based on the estimated proportion of the population aged 60 years and over who were resident in health institutions.

Summation of condition-specific prevalences across all causes in the Global Burden of Disease 2000 would result in overestimation of health state prevalences because of comorbidity between conditions. In previous editions of *The World Health Report*, adjustments have been made for independent comorbidity *(22)*. Following the scientific peer review, further work was undertaken to take dependent comorbidity properly into account. Data from five large national health surveys were analysed by age and sex to estimate the degree of dependent comorbidity for pairs of conditions. There was surprising consistency across the five surveys and the results were used for all Member States to adjust for dependent comorbidity in summation of condition-specific prevalences *(16)*.

Annex Table 4 reports for all Member States for 2002 the following: average HALE at birth, HALE at age 60, expected lost healthy years (LHE) at birth, percentage of total life expectancy (LE) lost, and 95% uncertainty intervals. LHE is calculated as LE – HALE and is the expected equivalent number of years of full health lost through living in health states other than full health. LHE expressed as a percentage of total LE represents the proportion of total life expectancy that is lost through living in health states of less than full health. Healthy life expectancies for 2002 are not comparable with those published for 2001 in *The World Health Report 2002* for many Member States, as they incorporate new epidemiological information, new data from health surveys, and new information on mortality rates, as well as the improvements in methods described above. In particular, the implementation of improved methods for dealing with comorbidity has resulted in a reduction in estimated proportion of healthy years of life lost at older ages compared to estimates published in previous years.

Annex Table 5

National health accounts (NHA) are a synthesis of the financing and spending flows recorded in the operation of a health system, with a potential to monitor all transactions from funding sources to the distribution of benefits across geographical, demographic, socioeconomic and epidemiological dimensions. NHA are related to the macroeconomic and macrosocial accounts whose methodology they borrow.

Annex Table 5 provides estimates for each of the 192 Member States. Although more and more countries collect health expenditure data, only a limited number have produced full national health accounts. Nationally and internationally available information that has been identified and obtained has been compiled for each country. Standard accounting estimation and extrapolation techniques have been applied to provide adequate time series. A policy-relevant breakdown of the data (for example, public/private expenditure) is also provided. Each year draft templates are sent to ministers of health for their comments and their assistance in obtaining additional information should that be necessary. The constructive responses from ministries have provided valuable information for the NHA estimates reported here.

An important methodological contribution to producing national health accounts is now available in the *Guide to producing national health accounts with special applications for low-income and middle-income countries (31)*. This guide is based on the Organisation for Economic Co-operation and Development (OECD) *System of health accounts (32)*. Both reports are built on the principles of the United Nations *System of national accounts* (commonly referred to as SNA93) *(33)*.

The principal international references used to produce the tables are the International Monetary Fund (IMF) *Government finance statistics yearbook, 2002 (34), International financial statistics yearbook, 2003 (35)* and *International Financial Statistics* (September 2003) *(36)*; the Asian Development Bank *Key indicators 2002 (37)*; *OECD health data 2003 (38)* and *International development statistics (39)*; and the United Nations *National accounts statistics: main aggregates and detailed tables, 2000 (40)*. The organizations charged with producing these reports facilitated the supply of advanced copies for WHO and gave additional related information, and their contributions are acknowledged with gratitude here.

National sources include: national health accounts reports, public expenditure reports, statistical yearbooks and other periodicals, budgetary documents, national accounts reports, statistical data on official web sites, nongovernmental organization reports, academic

studies, and reports and data provided by central statistical offices, ministries of health, ministries of finance and economic development, planning offices, and professional and trade associations.

Annex Table 5 provides both updated and revised figures for 1997–2000 and new data for 2001. Figures have been updated when new information that changes the original estimates has become available. This category includes benchmarking revisions, whereby an occasional wholesale revision is made by a country owing to a change in methodology, when a more extensive NHA effort is undertaken, or when shifting the denominator from SNA68 to SNA93. Colombia is a case in point.

Total expenditure on health has been defined as the sum of general government expenditure on health (GGHE or public expenditure on health), and private expenditure on health (PvtHE). All estimates are calculated in millions of national currency units (million NCU). The estimates are presented as ratios to gross domestic product (GDP), to total health expenditure (THE), to total general government expenditure (GGE), or to total private expenditure on health (PvtHE).

GDP is the value of all goods and services provided in a country by residents and non-residents without regard to their allocation among domestic and foreign claims. This (with small adjustments) corresponds to the total sum of expenditure (consumption and investment) of the private and government agents of the economy during the reference year. The United Nations *National accounts statistics: main aggregates and detailed tables, 2000 (40)*, table 1.1, was the main source of GDP estimates. For the 30 Member countries of the OECD, the macroeconomic accounts have been imported from the *National accounts of OECD countries 1990/2001, 2003 edition, volume II (41)*, table 1. Collaborative arrangements between WHO and the United Nations Statistics Division and the Economic Commission for Europe of the United Nations have permitted the receipt of advance information on 2001.

When United Nations data were unavailable, GDP data reported by the IMF (*International Financial Statistics*, September 2003) have been used. In the few cases where none of the preceding institutions reported updated GDP information, WHO has used data from other institutions or national series. National series were used for Andorra, the Federated States of Micronesia, Nicaragua, Niue, Palau, Samoa, Solomon Islands and Tonga. Figures for Kiribati were obtained from the Asian Development Bank. The estimates for Afghanistan, the Democratic People's Republic of Korea, Iraq, Somalia and Timor-Leste originate from policy reports, as no standard statistical sources had any information on these countries.

The data for China exclude estimates for Hong Kong Special Administrative Region and Macao Special Administrative Region. The health expenditure data for Jordan exclude the contributions from United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA), which provided basic health services support to Palestinian refugees residing on Jordanian territories, but include UNRWA expenditures to UNRWA clinics. The 1997 and 1998 health expenditure data for Serbia and Montenegro included the provinces of Kosovo and Metohia, but for 1999 and 2000 the data excluded Kosovo and Metohia, since these territories have been placed under the administration of the United Nations. The estimate for 2001 was also extrapolated without Kosovo and Metohia.

General government expenditure (GGE) includes consolidated direct outlays and indirect outlays (for example, subsidies to producers, transfers to households), including capital of all levels of government (central/federal, provincial/regional/state/district, and municipal/local authorities), social security institutions, autonomous bodies, and other extrabudgetary funds.

National accounts of OECD countries: detailed tables 1990/2001, 2003 edition, volume II, table 12, row 51, supplies the information for 27 member countries. The IMF *Government finance statistics yearbook* supplies an aggregate figure for 133 central/federal governments with complements for 23 regional and 45 local/municipal governments (as well as some social security payments for health data received from the IMF). It reports central government disbursement figures in its *International Financial Statistics*, row 82. Several other public finance audits, executed budgets, budget plans, statistical yearbooks, web sites, World Bank and Regional Development Bank reports, and academic studies have been consulted to verify total government expenditure. Extrapolations were made on incomplete time series using, inter alia, the differential between current disbursement plus savings in the United Nations *National accounts* up to 1995 and the IMF central government disbursement level. Several national authorities have also confirmed the GGE series during the consultative process.

GGHE comprises the outlays earmarked for the enhancement of the health status of population segments and/or the distribution of medical care goods and services among population segments by:

- central/federal, state/provincial/regional, and local/municipal authorities;
- extrabudgetary agencies, principally social security schemes, which operate in several countries;
- external resources (mainly grants and credits with high grant components to governments).

The figures for social security and extrabudgetary expenditure on health include purchases of health goods and services by schemes that are compulsory, under governmental control, and covering a sizeable segment of the population. A major hurdle has been the need to verify that no double counting occurs and that no cash benefits for sickness and/or loss of employment are included in the estimates, as these are classified as income maintenance expenditure.

All expenditures are to be accounted for, including final consumption, subsidies to producers, transfers to households (chiefly reimbursements for medical and pharmaceutical bills), investment and investment grants (also referred to as capital transfers). The classification of the functions of government, promoted by the United Nations, IMF, OECD and other institutions, sets the boundaries. In many instances, the data contained in the publications are limited to those supplied by ministries of health. Expenditures on health, however, should include expenditures where the primary intent is for health regardless of the implementing entity. An effort has been made to obtain data on health expenditures by other ministries, the armed forces, prisons, schools, universities and others, to ensure that all resources accounting for health expenditures are included. Information on external resources was received courtesy of the Development Action Committee of the OECD (DAC/OECD). A quarter of Member States explicitly monitor the external resources entering their health system, information that has been used to validate or amend the order of magnitude derived from the DAC entries.

OECD health data 2003 supplies GGHE entries for its member countries, with some gaps for the year 2001. In addition, the data for the year 2001 for Austria, Belgium, Iceland, Japan, Luxembourg, Republic of Korea and Turkey have been largely developed by WHO as they were not yet available through the OECD. Those have been projected by WHO. NHA studies were available for 54 non-OECD countries for one or more years. The detailed information in these reports permitted a more reliable basis for estimation than in other years. The IMF *Government finance statistics* reports central government expenditure on health for 122 countries, regional government outlays for health for 23 countries, and local government outlays on health for 45 countries. The GFS entries are not continuous time series for all countries,

but the document serves as an indicator that a reporting system exists in the 122 countries. A thorough search was conducted for the relevant national publications in those countries. In some cases it was observed that expenditures reported under the government finance classification of the GFS were limited to those of the ministry of health rather than all expenditures on health regardless of ministry. In such cases, other series were used to supplement that source. Government finance data, together with external resources data, statistical yearbooks, public finance reports, and analyses reporting on the implementation of health policies, have led to GGHE estimates for most WHO Member States. Information on Brunei Darussalam, for example, was accessed from national sources, but also from an International Medical Foundation of Japan data compendium *(42)*. This source provided a means for double checking health budget data for seven countries.

Several processes have been used to judge the validity of the data. For example, the aggregate expenditure obtained has been compared against in-patient care expenditure, pharmaceutical expenditure data and other records (including programme administration and other costs entering the *System of health accounts* classifications) to cross-validate the information, in order to ensure that: the outlays for which details have been assembled constitute the bulk of the government expenditure on health; intra-government transfers are consolidated; and the estimates obtained are judged plausible in terms of systems' descriptions. The aggregate governmental health expenditure data have also been compared with total GGE, providing an additional source of verification. Sometimes the GGHE and, therefore, the figures for total health expenditure, may be an underestimate if it is not possible to estimate for local government, nongovernmental organizations and insurance. For example THE for India may not include some agents that could result in an underestimate of between 0.3% and 0.6% of GDP. Information for Afghanistan and Iraq was received from the Regional Office for the Eastern Mediterranean, and for Cambodia from the country office.

Private expenditure on health has been defined as the sum of expenditures by the following entities:

- Prepaid plans and risk-pooling arrangements: the outlays of private and private social (with no government control over payment rates and participating providers but with broad guidelines from government) insurance schemes, commercial and non-profit (mutual) insurance schemes, health maintenance organizations, and other agents managing prepaid medical and paramedical benefits (including the operating costs of these schemes).
- Firms' expenditure on health: outlays by public and private enterprises for medical care and health-enhancing benefits other than payment to social security.
- Non-profit institutions serving mainly households: resources used to purchase health goods and services by entities whose status does not permit them to be a source of income, profit or other financial gain for the units that establish, control or finance them. This includes funding from internal and external sources.
- Household out-of-pocket spending: the direct outlays of households, including gratuities and in-kind payments made to health practitioners and suppliers of pharmaceuticals, therapeutic appliances, and other goods and services, whose primary intent is to contribute to the restoration or to the enhancement of the health status of individuals or population groups. This includes household payments to public services, non-profit institutions or nongovernmental organizations and non-reimbursable cost sharing, deductibles, co-payments and fee-for-service. It excludes payments made by enterprises which deliver medical and paramedical benefits, mandated by law or not, to their employees and payments for overseas treatment.

Most of the information on private health expenditures comes from national health accounts reports, statistical yearbooks and other periodicals, statistical data on official web sites, reports of nongovernmental organizations, household expenditure surveys, academic studies, and relevant reports of and data provided by central statistical offices, ministries of health, professional and trade associations. For the 30 OECD member countries they are obtained from *OECD health data*. Standard extrapolation and estimation techniques were used to obtain the figures for missing years.

Annex Table 6

Annex Table 6 presents total expenditure on health and general government expenditure on health in per capita terms. The methodology and sources to derive THE and GGHE have been discussed in the notes to Annex Table 5. Ratios are represented in per capita terms by dividing the expenditure figures by population figures. These per capita figures are expressed first in US dollars at an average exchange rate, which is the observed annual average number of units at which a currency is traded in the banking system. It is then also presented in international dollar estimates, derived by dividing local currency units by an estimate of their purchasing power parity (PPP) compared to US dollars, i.e. a rate or measure that minimizes the consequences of differences in price levels existing between countries.

OECD health data 2003 is the major source for population estimates for the 30 OECD member countries, just as it is for other health expenditure and macroeconomic variables. All estimates of population size and structure, other than for OECD countries, are based on demographic assessments prepared by the United Nations Population Division *(3)*. This report uses the estimates referred to as the de facto population, and not the de jure population in each Member State. An exception was made for Serbia and Montenegro for 2001, as expenditure figures excluded the provinces of Kosovo and Metohia, which became territories under the administration of the United Nations. Estimates for Serbia and Montenegro, excluding the populations of Kosovo and Metohia, were obtained from the *Statistical yearbook of Yugoslavia 2002*, thus ensuring that the basis for the numerator and denominator are consistent.

Three-quarters of the exchange rates (average for the year) have been obtained from the IMF *International Financial Statistics*, September 2003, row rf. Where information was lacking, available data from the United Nations, the World Bank and ad hoc donor reports (in the case of Afghanistan, for example) were used. The euro:US dollar rate has been applied for Andorra, Monaco and San Marino. The New Zealand dollar:US dollar rate has been applied for Niue. The Australian dollar rate has been applied for Nauru and Palau. Ecuador dollarized its economy in 2000, but the entire dataset has been recalculated in dollar terms for the five-year period reported.

For OECD member countries, the OECD PPP has been used to calculate international dollars. For countries that are part of the UNECE but are not members of OECD, the UNECE PPPs were calculated on the same basis as the OECD PPP. The remaining calculations for international dollars have been estimated by WHO using methods similar to those used by the World Bank.

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Annex Table 1 Basic indicators for all Member States

Figures computed by WHO to assure comparability;[a] they are not necessarily the official statistics of Member States, which may use alternative rigorous methods.

	Member State	POPULATION ESTIMATES								LIFE EXPECTANCY AT BIRTH (YEARS)
		Total population (000)	Annual growth rate (%)	Dependency ratio (per 100)		Percentage of population aged 60+ years		Total fertility rate		Both sexes
		2002	1992–2002	1992	2002	1992	2002	1992	2002	2002
1	Afghanistan	22 930	3.8	88	86	4.7	4.7	7.0	6.8	42.6
2	Albania	3 141	-0.4	60	53	7.9	9.5	2.9	2.3	70.4
3	Algeria	31 266	1.8	82	60	5.7	6.1	4.2	2.8	69.4
4	Andorra	69	1.8	48	46	20.0	21.6	1.4	1.3	80.3
5	Angola	13 184	2.9	97	101	4.6	4.4	7.2	7.2	39.9
6	Antigua and Barbuda	73	1.2	63	56	9.2	10.5	1.8	1.6	71.4
7	Argentina	37 981	1.3	64	59	13.0	13.5	2.8	2.5	74.4
8	Armenia	3 072	-1.3	57	44	10.5	13.1	2.2	1.2	70.0
9	Australia	19 544	1.2	50	48	15.6	16.7	1.9	1.7	80.4
10	Austria	8 111	0.3	48	47	19.9	21.3	1.5	1.3	79.4
11	Azerbaijan	8 297	1.1	63	57	7.6	9.2	2.8	2.1	65.8
12	Bahamas	310	1.5	58	53	6.8	8.5	2.6	2.3	72.1
13	Bahrain	709	3.0	51	47	3.7	4.0	3.5	2.7	73.2
14	Bangladesh	143 809	2.3	81	71	4.8	5.1	4.4	3.5	62.6
15	Barbados	269	0.4	55	43	15.0	13.1	1.6	1.5	74.3
16	Belarus	9 940	-0.4	52	46	17.4	19.3	1.7	1.2	68.3
17	Belgium	10 296	0.3	50	53	20.9	22.2	1.6	1.7	78.4
18	Belize	251	2.5	91	73	6.0	5.9	4.4	3.2	69.7
19	Benin	6 558	2.8	105	93	4.6	4.1	6.5	5.7	51.2
20	Bhutan	2 190	2.3	88	86	6.1	6.5	5.8	5.1	61.3
21	Bolivia	8 645	2.2	81	77	6.1	6.6	4.8	3.9	63.2
22	Bosnia and Herzegovina	4 126	0.4	43	40	11.1	15.3	1.6	1.3	72.8
23	Botswana	1 770	2.1	89	74	3.7	4.4	4.5	3.7	40.4
24	Brazil	176 257	1.4	63	51	6.8	8.1	2.6	2.2	68.9
25	Brunei Darussalam	350	2.6	57	51	4.1	4.5	3.1	2.5	76.1
26	Bulgaria	7 965	-0.8	50	45	19.9	21.7	1.5	1.1	71.9
27	Burkina Faso	12 624	2.9	108	106	4.5	4.0	7.1	6.7	41.7
28	Burundi	6 602	1.3	97	99	4.6	4.4	6.8	6.8	40.8
29	Cambodia	13 810	2.8	98	81	4.4	4.6	5.5	4.8	54.6
30	Cameroon	15 729	2.4	94	86	5.5	5.6	5.7	4.7	48.1
31	Canada	31 271	1.0	47	45	15.8	17.1	1.7	1.5	79.8
32	Cape Verde	454	2.2	103	80	6.6	6.3	4.8	3.4	70.1
33	Central African Republic	3 819	2.1	89	89	6.1	6.1	5.6	5.0	42.9
34	Chad	8 348	3.1	96	99	5.2	4.9	6.7	6.7	47.7
35	Chile	15 613	1.4	57	54	9.2	10.7	2.5	2.4	76.7
36	China	1 302 307	0.9	49	44	8.6	10.0	2.0	1.8	71.1
37	Colombia	43 526	1.8	66	59	6.4	7.1	3.0	2.6	71.8
38	Comoros	747	3.0	95	82	4.0	4.2	5.9	4.9	63.3
39	Congo	3 633	3.2	96	99	4.8	4.6	6.3	6.3	53.1
40	Cook Islands	18	-0.2	71	65	6.2	7.2	4.0	3.2	71.6
41	Costa Rica	4 094	2.4	68	56	7.1	7.9	3.0	2.3	77.1
42	Côte d'Ivoire	16 365	2.1	94	82	4.4	5.2	6.1	4.8	45.3
43	Croatia	4 439	-0.6	46	49	18.3	21.7	1.6	1.6	74.8
44	Cuba	11 271	0.4	45	44	11.9	14.5	1.6	1.6	77.1
45	Cyprus	796	1.2	58	51	14.8	16.1	2.3	1.9	77.3
46	Czech Republic	10 246	-0.1	50	42	17.8	18.8	1.7	1.2	75.8
47	Democratic People's Republic of Korea	22 541	0.9	47	48	8.0	10.6	2.3	2.0	65.8
48	Democratic Republic of the Congo	51 201	2.4	100	98	4.4	4.2	6.7	6.7	43.5
49	Denmark	5 351	0.3	48	50	20.2	20.4	1.7	1.8	77.2
50	Djibouti	693	2.3	85	86	4.6	5.1	6.3	5.7	49.6
51	Dominica	78	0.7	63	56	9.2	10.5	2.0	1.8	73.3
52	Dominican Republic	8 616	1.7	70	59	5.6	6.9	3.2	2.7	68.0
53	Ecuador	12 810	1.8	73	62	6.3	7.3	3.6	2.8	70.6
54	Egypt	70 507	1.9	80	66	6.3	6.9	4.1	3.3	67.1

	LIFE EXPECTANCY AT BIRTH (YEARS)				PROBABILITY OF DYING (PER 1000)							
					Under age 5 years				Between ages 15 and 60 years			
	Males		Females		Males		Females		Males		Females	
	2002	Uncertainty	2002	Uncertainty	2002	Uncertainty	2002	Uncertainty	2002	Uncertainty	2002	Uncertainty
1	41.9	32.0 - 49.5	43.4	31.3 - 53.2	258	208 - 310	256	205 - 306	494	335 - 731	413	192 - 705
2	67.3	65.9 - 68.7	74.1	73.0 - 75.0	27	13 - 41	23	11 - 34	167	137 - 199	94	79 - 111
3	67.5	66.2 - 69.1	71.2	69.8 - 72.5	54	43 - 64	43	35 - 52	170	152 - 187	128	112 - 146
4	76.8	76.0 - 77.8	83.7	83.0 - 84.3	5	5 - 6	4	4 - 5	113	101 - 125	43	39 - 48
5	37.9	29.5 - 44.1	42.0	32.8 - 50.6	279	248 - 312	247	219 - 275	594	425 - 824	481	255 - 726
6	69.0	67.5 - 70.5	73.9	72.3 - 75.4	22	11 - 33	18	9 - 28	195	173 - 216	125	111 - 141
7	70.8	70.4 - 71.2	78.1	77.9 - 78.3	20	18 - 21	16	15 - 17	177	170 - 184	90	88 - 93
8	67.0	66.2 - 67.9	73.0	72.1 - 73.8	39	22 - 56	35	19 - 46	204	184 - 225	98	85 - 115
9	77.9	77.6 - 78.1	83.0	82.7 - 83.2	6	6 - 7	5	5 - 6	91	89 - 94	52	50 - 54
10	76.4	76.1 - 76.7	82.2	81.8 - 82.4	6	5 - 7	4	4 - 5	117	113 - 121	59	56 - 63
11	63.0	61.7 - 64.2	68.6	67.5 - 69.8	80	64 - 98	70	56 - 83	231	199 - 261	122	103 - 144
12	69.0	67.9 - 70.0	75.2	74.3 - 76.2	13	10 - 17	11	8 - 15	248	225 - 275	153	142 - 163
13	72.1	70.7 - 73.6	74.5	73.2 - 75.8	13	8 - 22	10	6 - 15	113	96 - 130	82	68 - 98
14	62.6	61.3 - 63.9	62.6	61.4 - 63.7	71	68 - 75	73	70 - 77	251	223 - 282	258	232 - 284
15	70.5	69.6 - 71.4	77.9	76.8 - 79.0	17	13 - 22	15	9 - 23	189	171 - 206	103	91 - 115
16	62.6	62.0 - 63.2	74.3	73.7 - 74.9	14	11 - 16	10	8 - 13	371	347 - 397	134	120 - 148
17	75.2	74.9 - 75.5	81.5	81.3 - 81.8	6	5 - 7	5	4 - 6	126	122 - 130	67	64 - 69
18	67.4	66.0 - 68.7	72.4	71.4 - 73.4	44	33 - 56	34	25 - 42	189	172 - 211	123	117 - 129
19	50.1	42.9 - 56.5	52.4	43.0 - 60.1	166	163 - 170	158	155 - 161	424	253 - 634	360	176 - 611
20	60.2	52.3 - 67.6	62.4	53.5 - 69.0	93	74 - 111	92	73 - 111	272	111 - 474	226	102 - 428
21	61.8	54.6 - 69.3	64.7	56.2 - 70.9	78	74 - 82	73	70 - 77	260	101 - 445	209	91 - 402
22	69.3	67.9 - 71.0	76.4	75.2 - 77.6	20	15 - 25	15	11 - 19	192	162 - 220	90	76 - 105
23	40.2	37.3 - 43.3	40.6	37.7 - 44.1	104	89 - 121	102	86 - 118	786	718 - 842	745	676 - 801
24	65.7	65.2 - 66.2	72.3	71.8 - 72.7	42	36 - 49	34	29 - 40	246	235 - 257	136	128 - 145
25	74.8	73.5 - 76.3	77.4	76.6 - 78.2	14	12 - 16	12	11 - 14	112	94 - 128	85	73 - 98
26	68.7	68.1 - 69.3	75.3	74.7 - 75.9	18	16 - 21	16	13 - 18	219	205 - 234	97	88 - 106
27	40.6	34.3 - 46.6	42.6	34.7 - 49.8	232	211 - 251	217	197 - 235	597	417 - 793	522	334 - 736
28	38.7	33.0 - 44.5	43.0	36.0 - 50.2	189	152 - 224	177	142 - 216	692	541 - 834	563	393 - 750
29	51.9	44.8 - 57.4	57.1	49.1 - 63.4	149	138 - 159	124	115 - 132	400	261 - 604	298	165 - 487
30	47.2	41.1 - 53.9	49.0	41.4 - 56.7	162	151 - 174	158	147 - 169	519	344 - 697	454	273 - 658
31	77.2	77.0 - 77.4	82.3	82.1 - 82.4	6	6 - 6	5	5 - 5	95	93 - 97	58	57 - 60
32	66.6	62.4 - 71.0	72.9	69.6 - 75.8	42	33 - 50	30	24 - 36	210	125 - 312	120	76 - 178
33	42.1	36.2 - 48.4	43.7	36.7 - 50.2	187	156 - 219	173	142 - 201	620	474 - 780	566	418 - 740
34	46.1	38.3 - 53.1	49.3	40.9 - 57.6	202	168 - 235	180	149 - 210	477	305 - 684	402	203 - 618
35	73.4	72.7 - 74.0	80.0	79.7 - 80.3	16	14 - 18	13	12 - 14	134	124 - 144	67	64 - 70
36	69.6	69.0 - 70.3	72.7	72.0 - 73.5	31	29 - 33	41	38 - 44	165	154 - 175	104	93 - 112
37	67.5	66.8 - 68.2	76.3	75.4 - 77.1	27	24 - 29	19	17 - 21	236	220 - 251	99	87 - 113
38	61.6	53.7 - 68.9	64.9	56.4 - 71.3	80	64 - 96	72	57 - 86	260	100 - 464	207	91 - 405
39	51.6	44.6 - 58.9	54.5	46.7 - 61.6	109	82 - 135	101	75 - 125	474	309 - 651	410	263 - 611
40	69.2	68.2 - 70.3	74.2	73.4 - 75.0	21	10 - 31	19	10 - 27	173	150 - 193	109	98 - 123
41	74.8	74.5 - 75.0	79.5	79.3 - 79.8	12	11 - 13	10	9 - 11	127	122 - 131	74	70 - 78
42	43.1	36.4 - 50.1	48.0	40.8 - 54.7	192	154 - 232	143	114 - 169	577	400 - 757	502	353 - 694
43	71.0	70.6 - 71.4	78.6	78.1 - 79.0	8	7 - 10	7	7 - 8	178	169 - 187	72	67 - 77
44	75.0	74.6 - 75.4	79.3	79.1 - 79.5	8	7 - 10	7	6 - 7	138	132 - 145	89	86 - 91
45	75.5	74.8 - 76.2	79.1	77.2 - 80.9	7	6 - 9	7	6 - 9	102	93 - 111	48	38 - 63
46	72.4	72.1 - 72.8	79.0	78.7 - 79.3	5	4 - 6	4	4 - 5	163	157 - 170	72	69 - 76
47	64.4	56.5 - 72.3	67.1	57.9 - 75.2	56	29 - 83	54	30 - 80	236	83 - 416	191	70 - 386
48	41.0	34.7 - 47.1	46.1	38.0 - 52.8	221	190 - 252	198	169 - 225	585	432 - 749	449	298 - 655
49	74.8	74.6 - 75.0	79.5	79.4 - 79.7	6	5 - 7	5	4 - 6	123	120 - 127	76	73 - 78
50	48.6	42.4 - 56.1	50.7	43.0 - 58.2	156	132 - 179	144	121 - 166	481	290 - 657	431	259 - 639
51	71.0	69.7 - 72.2	75.8	74.2 - 77.2	13	11 - 15	14	10 - 18	206	182 - 235	120	94 - 155
52	64.9	63.9 - 65.9	71.5	70.5 - 72.4	37	32 - 41	30	26 - 35	256	231 - 279	150	132 - 171
53	67.9	67.3 - 68.5	73.5	72.9 - 74.2	34	28 - 39	30	25 - 34	216	204 - 229	132	120 - 143
54	65.3	65.0 - 65.6	69.0	68.7 - 69.3	38	34 - 42	39	35 - 43	240	231 - 248	157	151 - 164

Annex Table 1 Basic indicators for all Member States

Figures computed by WHO to assure comparability;[a] they are not necessarily the official statistics of Member States, which may use alternative rigorous methods.

	Member State	POPULATION ESTIMATES								LIFE EXPECTANCY AT BIRTH (YEARS)
		Total population (000)	Annual growth rate (%)	Dependency ratio (per 100)		Percentage of population aged 60+ years		Total fertility rate		Both sexes
		2002	1992–2002	1992	2002	1992	2002	1992	2002	2002
55	El Salvador	6 415	1.9	78	68	6.6	7.5	3.6	2.9	69.7
56	Equatorial Guinea	481	2.6	87	91	6.4	5.9	5.9	5.9	53.4
57	Eritrea	3 991	2.4	93	91	3.6	3.6	6.2	5.5	57.6
58	Estonia	1 338	-1.4	51	48	17.8	21.5	1.7	1.2	71.1
59	Ethiopia	68 961	2.8	94	94	4.4	4.6	6.8	6.2	48.0
60	Fiji	831	1.2	67	57	5.0	6.0	3.4	2.9	67.3
61	Finland	5 197	0.3	49	49	18.7	20.3	1.8	1.7	78.2
62	France	59 850	0.4	52	53	19.5	20.5	1.7	1.9	79.7
63	Gabon	1 306	2.6	92	83	7.4	6.2	5.2	4.0	59.2
64	Gambia	1 388	3.3	84	80	5.1	5.8	5.7	4.8	57.1
65	Georgia	5 177	-0.5	52	49	15.6	18.9	1.9	1.4	71.7
66	Germany	82 414	0.2	46	48	20.5	24.0	1.3	1.3	78.7
67	Ghana	20 471	2.4	92	77	4.6	5.2	5.4	4.2	57.6
68	Greece	10 970	0.7	48	49	20.7	23.8	1.4	1.3	78.4
69	Grenada	80	-0.5	63	56	9.2	10.5	4.0	3.5	67.4
70	Guatemala	12 036	2.7	96	87	5.2	5.3	5.4	4.5	65.9
71	Guinea	8 359	2.4	93	88	4.4	4.5	6.4	5.9	52.3
72	Guinea-Bissau	1 449	3.0	95	101	5.4	4.9	7.1	7.1	47.2
73	Guyana	764	0.4	67	54	6.8	7.0	2.6	2.3	64.3
74	Haiti	8 218	1.4	91	76	5.7	5.9	4.9	4.0	50.1
75	Honduras	6 781	2.8	91	80	4.6	5.4	5.0	3.8	67.2
76	Hungary	9 923	-0.4	49	45	19.2	20.0	1.7	1.2	72.6
77	Iceland	287	1.0	55	53	14.8	15.3	2.2	2.0	80.1
78	India	1 049 549	1.8	68	62	6.9	7.7	3.8	3.1	61.0
79	Indonesia	217 131	1.4	64	54	6.4	7.9	3.1	2.4	66.4
80	Iran, Islamic Republic of	68 070	1.4	93	59	5.9	6.4	4.5	2.4	68.9
81	Iraq	24 510	2.9	88	79	4.4	4.6	5.7	4.8	61.0
82	Ireland	3 911	1.0	60	47	15.3	15.3	2.0	1.9	77.1
83	Israel	6 304	2.7	66	61	12.6	13.1	2.9	2.7	79.4
84	Italy	57 482	0.1	45	49	21.7	24.5	1.3	1.2	79.7
85	Jamaica	2 627	0.9	73	61	9.9	9.6	2.8	2.4	72.8
86	Japan	127 478	0.2	43	48	18.6	24.4	1.5	1.3	81.9
87	Jordan	5 329	3.9	91	69	4.4	4.8	5.0	3.6	70.8
88	Kazakhstan	15 469	-0.9	59	51	9.4	11.5	2.5	2.0	63.6
89	Kenya	31 540	2.3	104	82	4.1	4.2	5.5	4.1	50.9
90	Kiribati	87	1.5	70	68	6.2	7.0	4.7	4.1	64.1
91	Kuwait	2 443	2.1	56	38	2.1	2.7	3.3	2.7	76.2
92	Kyrgyzstan	5 067	1.3	75	64	8.4	8.7	3.5	2.7	64.5
93	Lao People's Democratic Republic	5 529	2.4	91	84	5.9	5.5	5.9	4.8	55.1
94	Latvia	2 329	-1.3	51	48	18.4	21.8	1.7	1.1	70.3
95	Lebanon	3 596	2.3	65	56	8.3	8.6	2.9	2.2	69.8
96	Lesotho	1 800	1.1	94	81	6.7	6.9	4.8	3.9	35.7
97	Liberia	3 239	4.6	97	96	3.9	3.7	6.9	6.8	41.8
98	Libyan Arab Jamahiriya	5 445	2.0	81	54	4.5	6.0	4.3	3.1	72.6
99	Lithuania	3 465	-0.6	51	51	16.9	19.7	1.8	1.3	71.9
100	Luxembourg	447	1.5	44	49	18.1	18.3	1.6	1.7	78.8
101	Madagascar	16 916	2.9	92	91	4.8	4.7	6.2	5.7	56.3
102	Malawi	11 871	1.9	94	99	4.8	5.2	6.8	6.1	40.2
103	Malaysia	23 965	2.4	67	60	5.8	6.7	3.7	2.9	72.0
104	Maldives	309	3.0	99	86	5.4	5.2	6.2	5.4	66.1
105	Mali	12 623	2.8	103	107	3.9	3.8	7.0	7.0	44.8
106	Malta	393	0.7	51	47	15.1	17.5	2.0	1.8	78.1
107	Marshall Islands	52	1.3	70	68	6.2	7.0	6.3	5.5	62.7
108	Mauritania	2 807	2.8	89	87	5.3	5.3	6.1	5.8	52.1
109	Mauritius	1 210	1.1	52	46	8.4	9.0	2.3	2.0	71.9

	LIFE EXPECTANCY AT BIRTH (YEARS)				PROBABILITY OF DYING (PER 1000)							
					Under age 5 years				Between ages 15 and 60 years			
	Males		Females		Males		Females		Males		Females	
	2002	Uncertainty	2002	Uncertainty	2002	Uncertainty	2002	Uncertainty	2002	Uncertainty	2002	Uncertainty
55	66.5	65.4 - 67.8	72.8	72.1 - 73.5	36	31 - 42	34	28 - 39	257	227 - 289	142	129 - 155
56	51.9	44.4 - 58.8	54.8	46.0 - 61.7	157	132 - 181	144	125 - 166	383	217 - 596	318	152 - 548
57	55.8	47.2 - 65.8	59.3	51.0 - 66.8	117	107 - 127	102	93 - 111	350	176 - 496	286	137 - 484
58	65.1	64.8 - 65.5	77.1	76.8 - 77.4	10	7 - 12	6	4 - 7	322	313 - 331	112	105 - 118
59	46.8	39.3 - 54.0	49.4	41.3 - 57.2	185	148 - 220	168	138 - 196	487	316 - 693	422	244 - 628
60	64.6	63.7 - 65.7	70.3	69.3 - 71.4	30	27 - 33	27	24 - 29	281	260 - 301	176	159 - 193
61	74.8	74.5 - 75.0	81.5	81.2 - 81.8	4	4 - 5	3	3 - 3	135	131 - 140	60	56 - 64
62	75.9	75.5 - 76.2	83.5	83.2 - 83.7	5	5 - 6	4	4 - 5	133	128 - 138	60	58 - 62
63	57.3	49.9 - 64.6	61.4	52.9 - 68.9	100	91 - 108	79	72 - 86	342	171 - 557	281	133 - 499
64	55.4	47.5 - 62.3	58.9	50.2 - 66.7	132	112 - 152	117	99 - 135	330	159 - 552	265	110 - 467
65	68.4	67.2 - 69.6	75.0	73.1 - 76.7	26	23 - 28	20	18 - 22	207	181 - 237	86	67 - 109
66	75.6	75.2 - 75.9	81.6	81.4 - 81.7	5	5 - 6	4	4 - 4	118	114 - 123	60	59 - 62
67	56.3	49.0 - 64.4	58.8	50.1 - 66.0	106	92 - 123	99	87 - 112	354	171 - 557	303	153 - 529
68	75.8	75.6 - 76.0	81.1	80.7 - 81.5	7	6 - 7	5	4 - 6	118	115 - 120	48	45 - 51
69	65.9	64.8 - 67.1	68.8	67.8 - 70.0	25	18 - 30	21	15 - 27	261	238 - 283	222	204 - 239
70	63.1	61.9 - 64.3	69.0	67.7 - 70.1	57	52 - 63	50	45 - 55	283	247 - 324	162	131 - 199
71	50.9	44.0 - 57.5	53.7	45.0 - 61.0	163	148 - 179	153	138 - 168	401	232 - 596	332	159 - 559
72	45.7	37.9 - 51.6	48.7	39.8 - 56.8	215	194 - 237	198	179 - 217	462	311 - 681	383	186 - 615
73	61.5	58.9 - 64.5	66.9	63.8 - 70.0	61	30 - 90	50	26 - 76	299	268 - 328	202	170 - 233
74	49.1	42.8 - 55.5	51.1	43.6 - 57.3	138	119 - 157	128	111 - 145	493	345 - 660	438	309 - 615
75	64.2	60.3 - 67.8	70.4	67.2 - 73.2	44	42 - 46	42	40 - 44	269	195 - 362	150	102 - 214
76	68.4	67.9 - 68.9	76.8	76.3 - 77.2	10	9 - 11	8	7 - 9	256	241 - 272	112	104 - 119
77	78.4	77.8 - 79.0	81.8	81.4 - 82.2	4	4 - 5	3	3 - 3	85	79 - 92	55	51 - 60
78	60.1	59.4 - 60.8	62.0	61.1 - 62.8	87	81 - 92	95	86 - 106	291	268 - 314	220	197 - 243
79	64.9	64.1 - 65.8	67.9	67.1 - 68.8	45	40 - 50	36	33 - 40	244	226 - 261	208	194 - 224
80	66.5	65.4 - 67.8	71.7	70.5 - 72.8	42	33 - 50	36	29 - 43	213	194 - 230	132	121 - 145
81	59.1	57.1 - 60.9	63.1	61.3 - 64.9	119	101 - 139	110	94 - 127	252	228 - 278	176	155 - 197
82	74.4	73.8 - 75.0	79.8	79.3 - 80.1	8	7 - 9	6	5 - 7	113	105 - 121	66	62 - 71
83	77.3	77.1 - 77.5	81.4	81.2 - 81.5	7	6 - 8	6	6 - 7	98	95 - 101	53	50 - 56
84	76.8	76.4 - 77.1	82.5	82.2 - 82.8	5	5 - 6	5	4 - 5	96	92 - 100	49	46 - 51
85	71.1	69.9 - 72.5	74.6	73.6 - 75.6	16	13 - 19	14	11 - 17	162	137 - 184	121	107 - 134
86	78.4	78.4 - 78.4	85.3	85.2 - 85.3	4	4 - 4	4	4 - 4	95	95 - 96	46	45 - 46
87	68.6	67.7 - 69.8	73.3	72.6 - 74.0	28	23 - 32	26	22 - 30	191	171 - 210	121	113 - 130
88	58.7	58.0 - 59.4	68.9	68.1 - 69.7	38	29 - 48	28	21 - 36	426	385 - 462	195	177 - 213
89	49.8	43.8 - 57.4	51.9	44.8 - 59.3	119	108 - 129	113	104 - 122	509	328 - 684	448	285 - 642
90	61.8	60.8 - 62.8	66.7	65.6 - 67.6	80	74 - 88	69	60 - 79	293	260 - 327	190	167 - 215
91	75.8	74.7 - 77.1	76.9	74.8 - 79.0	14	10 - 19	11	8 - 15	81	72 - 91	63	48 - 80
92	60.4	59.5 - 61.4	68.9	68.1 - 69.8	63	50 - 76	55	44 - 66	345	314 - 371	163	146 - 180
93	54.1	51.4 - 56.7	56.2	53.5 - 58.8	146	120 - 174	131	106 - 158	338	303 - 373	306	278 - 333
94	64.6	64.3 - 64.9	75.8	75.6 - 76.1	15	12 - 17	12	10 - 14	327	320 - 334	118	113 - 122
95	67.6	66.4 - 68.8	72.0	71.1 - 73.1	35	31 - 39	29	26 - 32	201	177 - 225	139	123 - 154
96	32.9	29.3 - 38.5	38.2	33.0 - 44.9	166	133 - 201	160	128 - 191	902	791 - 965	742	599 - 853
97	40.1	32.2 - 47.0	43.7	34.8 - 51.7	242	197 - 293	222	178 - 262	582	435 - 773	471	283 - 690
98	70.4	66.3 - 73.8	75.5	73.0 - 77.8	19	16 - 21	17	15 - 20	173	110 - 263	99	65 - 142
99	66.2	65.2 - 67.0	77.6	77.0 - 78.2	11	9 - 13	9	7 - 11	303	272 - 341	103	94 - 112
100	75.7	75.3 - 76.2	81.7	81.1 - 82.3	5	4 - 7	5	4 - 6	119	113 - 125	64	58 - 70
101	54.4	46.8 - 61.0	58.4	49.5 - 65.0	145	126 - 164	125	110 - 141	333	177 - 543	262	123 - 474
102	39.8	35.0 - 45.2	40.6	35.0 - 47.1	197	183 - 210	190	178 - 203	657	509 - 803	610	449 - 769
103	69.6	69.1 - 70.1	74.7	74.4 - 75.1	10	8 - 11	8	7 - 10	192	181 - 202	106	100 - 111
104	66.5	65.7 - 67.4	65.6	64.9 - 66.5	38	33 - 42	43	38 - 49	205	179 - 231	202	174 - 229
105	43.9	35.8 - 49.7	45.7	36.8 - 54.0	233	211 - 256	224	200 - 244	487	328 - 718	417	210 - 662
106	75.9	75.2 - 76.5	80.3	79.3 - 81.2	7	6 - 9	6	4 - 8	87	82 - 94	51	44 - 59
107	61.1	59.5 - 62.9	64.6	63.2 - 66.2	46	34 - 57	36	27 - 45	340	310 - 368	286	264 - 307
108	49.8	41.7 - 56.1	54.5	44.7 - 61.3	186	158 - 214	155	132 - 178	393	245 - 603	304	156 - 536
109	68.4	67.6 - 69.2	75.5	75.0 - 76.0	20	16 - 25	14	11 - 19	222	202 - 243	116	109 - 123

Annex Table 1 Basic indicators for all Member States

Figures computed by WHO to assure comparability;[a] they are not necessarily the official statistics of Member States, which may use alternative rigorous methods.

	Member State	POPULATION ESTIMATES								LIFE EXPECTANCY AT BIRTH (YEARS)
		Total population (000)	Annual growth rate (%)	Dependency ratio (per 100)		Percentage of population aged 60+ years		Total fertility rate		Both sexes
		2002	1992–2002	1992	2002	1992	2002	1992	2002	2002
110	Mexico	101 965	1.7	71	61	6.0	7.2	3.2	2.5	74.4
111	Micronesia, Federated States of	108	0.7	92	74	5.5	5.1	4.8	3.8	66.5
112	Monaco	34	1.1	52	53	19.5	20.5	1.7	1.8	81.2
113	Mongolia	2 559	1.1	81	59	5.9	5.6	3.5	2.4	62.9
114	Morocco	30 072	1.7	73	57	6.0	6.6	3.6	2.8	70.8
115	Mozambique	18 537	2.6	96	89	5.2	5.1	6.2	5.7	42.6
116	Myanmar	48 852	1.5	69	59	6.8	6.9	3.8	2.9	58.9
117	Namibia	1 961	2.7	87	88	5.4	5.6	5.6	4.6	49.3
118	Nauru	13	2.5	70	68	6.2	7.0	4.5	3.9	62.7
119	Nepal	24 609	2.3	81	78	5.6	5.8	5.0	4.3	60.1
120	Netherlands	16 067	0.6	45	48	17.5	18.5	1.6	1.7	78.6
121	New Zealand	3 846	1.1	53	53	15.3	15.9	2.1	2.0	78.9
122	Nicaragua	5 335	2.8	95	82	4.4	4.7	4.8	3.8	70.1
123	Niger	11 544	3.5	108	108	3.6	3.3	8.0	8.0	42.6
124	Nigeria	120 911	2.8	96	91	4.7	4.8	6.4	5.5	48.8
125	Niue	2	-1.2	71	65	6.2	7.2	3.6	2.9	70.3
126	Norway	4 514	0.5	55	54	20.6	19.6	1.9	1.8	79.1
127	Oman	2 768	3.3	82	65	3.0	3.5	6.5	5.0	73.1
128	Pakistan	149 911	2.5	86	82	5.5	5.7	5.9	5.1	61.4
129	Palau	20	2.3	70	68	6.2	7.0	2.8	2.4	68.5
130	Panama	3 064	2.0	65	59	7.3	8.3	2.9	2.7	75.4
131	Papua New Guinea	5 586	2.6	79	77	4.2	4.0	5.1	4.1	59.8
132	Paraguay	5 740	2.5	84	74	5.3	5.5	4.6	3.9	71.7
133	Peru	26 767	1.7	71	63	6.2	7.4	3.7	2.9	69.7
134	Philippines	78 580	2.1	77	67	5.0	5.7	4.2	3.2	68.3
135	Poland	38 622	0.1	54	44	15.2	16.6	1.9	1.3	74.7
136	Portugal	10 049	0.2	49	48	19.5	21.1	1.5	1.5	77.1
137	Qatar	601	2.0	39	39	2.1	3.1	4.2	3.3	74.3
138	Republic of Korea	47 430	0.8	43	39	8.2	11.8	1.7	1.4	75.5
139	Republic of Moldova	4 270	-0.2	57	45	12.9	13.8	2.2	1.4	67.8
140	Romania	22 387	-0.3	50	45	16.3	18.9	1.6	1.3	71.4
141	Russian Federation	144 082	-0.3	50	42	16.3	18.3	1.6	1.2	64.8
142	Rwanda	8 272	3.2	98	91	3.8	4.0	6.7	5.8	44.4
143	Saint Kitts and Nevis	42	0.0	63	56	9.2	10.5	2.7	2.4	70.4
144	Saint Lucia	148	0.9	75	57	8.6	7.8	3.2	2.3	72.2
145	Saint Vincent and the Grenadines	119	0.6	79	61	8.7	9.2	2.9	2.2	69.8
146	Samoa	176	0.8	81	81	6.3	6.5	4.7	4.2	68.2
147	San Marino	27	1.4	45	49	21.7	24.5	1.3	1.2	80.6
148	Sao Tome and Principe	157	2.6	104	83	6.6	6.4	5.0	4.0	62.7
149	Saudi Arabia	23 520	3.0	80	72	3.4	4.3	5.8	4.6	70.8
150	Senegal	9 855	2.4	95	85	4.1	4.0	6.1	5.0	55.8
151	Serbia and Montenegro	10 535	0.2	50	49	16.0	18.4	2.0	1.7	72.3
152	Seychelles	80	1.0	52	46	8.4	9.0	2.1	1.8	71.5
153	Sierra Leone	4 764	1.5	87	89	5.0	4.7	6.5	6.5	34.0
154	Singapore	4 183	2.8	38	40	8.7	11.1	1.8	1.4	79.6
155	Slovakia	5 398	0.2	54	43	15.0	15.5	1.9	1.3	74.0
156	Slovenia	1 986	0.2	44	42	17.4	19.8	1.4	1.2	76.7
157	Solomon Islands	463	3.2	93	84	4.4	4.4	5.6	4.5	65.4
158	Somalia	9 480	2.8	102	101	4.2	3.8	7.3	7.3	44.3
159	South Africa	44 759	1.5	70	59	5.2	6.1	3.4	2.6	50.7
160	Spain	40 977	0.4	48	46	20.0	21.6	1.3	1.2	79.6
161	Sri Lanka	18 910	0.9	58	47	8.8	10.2	2.4	2.0	70.3
162	Sudan	32 878	2.3	81	76	5.1	5.6	5.3	4.4	57.1
163	Suriname	432	0.7	66	58	7.1	8.0	2.5	2.5	67.6

	LIFE EXPECTANCY AT BIRTH (YEARS)				PROBABILITY OF DYING (PER 1000)							
					Under age 5 years				Between ages 15 and 60 years			
	Males		Females		Males		Females		Males		Females	
	2002	Uncertainty	2002	Uncertainty	2002	Uncertainty	2002	Uncertainty	2002	Uncertainty	2002	Uncertainty
110	71.7	71.0 - 72.3	77.0	76.5 - 77.4	30	26 - 34	24	21 - 27	170	160 - 183	97	92 - 103
111	64.9	63.0 - 67.1	68.1	66.1 - 70.2	63	44 - 81	51	35 - 67	211	184 - 236	176	151 - 202
112	77.8	77.6 - 77.9	84.5	84.0 - 85.0	5	4 - 5	3	3 - 4	109	108 - 111	47	44 - 50
113	60.1	59.8 - 60.5	65.9	65.5 - 66.3	75	73 - 78	66	64 - 68	319	310 - 327	219	210 - 227
114	68.8	67.4 - 70.3	72.8	71.6 - 74.1	43	36 - 49	41	35 - 47	160	138 - 185	104	88 - 120
115	41.2	35.3 - 47.5	43.9	36.8 - 51.3	212	185 - 240	201	176 - 226	613	479 - 741	519	375 - 665
116	56.2	48.4 - 64.0	61.8	52.6 - 69.6	118	88 - 151	94	66 - 122	335	175 - 539	236	107 - 444
117	48.1	43.3 - 54.3	50.5	44.0 - 56.8	97	86 - 107	93	83 - 103	605	479 - 733	529	404 - 691
118	59.7	55.6 - 64.0	66.5	63.1 - 70.3	18	14 - 21	12	10 - 15	448	326 - 564	303	211 - 389
119	59.9	58.9 - 61.0	60.2	59.2 - 61.1	81	77 - 85	87	83 - 91	301	277 - 325	290	271 - 310
120	76.0	75.7 - 76.3	81.1	80.8 - 81.3	6	6 - 7	5	5 - 6	94	91 - 97	65	63 - 68
121	76.6	76.2 - 77.1	81.2	80.8 - 81.6	7	6 - 8	6	4 - 7	98	94 - 104	63	59 - 67
122	67.9	67.2 - 68.6	72.4	71.6 - 73.2	38	31 - 45	32	27 - 38	213	199 - 226	143	126 - 163
123	42.6	31.9 - 50.6	42.7	30.9 - 51.6	249	199 - 299	256	206 - 307	497	327 - 755	443	232 - 744
124	48.0	41.2 - 54.6	49.6	40.7 - 57.1	183	162 - 205	181	159 - 202	453	287 - 632	392	217 - 612
125	67.6	63.9 - 70.8	73.3	70.4 - 76.1	38	14 - 91	24	12 - 48	191	124 - 261	132	89 - 182
126	76.4	75.8 - 76.9	81.7	81.4 - 81.9	5	4 - 6	4	4 - 4	100	93 - 106	60	57 - 63
127	71.0	67.1 - 74.5	76.3	73.8 - 78.7	15	13 - 18	14	12 - 16	165	105 - 249	93	60 - 136
128	61.1	59.3 - 62.9	61.6	59.7 - 63.7	105	89 - 120	115	98 - 134	227	201 - 254	201	176 - 225
129	66.4	65.9 - 66.9	70.9	70.0 - 71.9	24	17 - 30	22	16 - 27	236	224 - 246	202	184 - 223
130	72.8	72.0 - 73.8	78.2	77.4 - 78.9	25	23 - 28	21	19 - 23	146	132 - 159	84	76 - 94
131	58.4	56.5 - 60.4	61.5	59.7 - 63.4	98	78 - 117	92	73 - 108	311	284 - 337	249	227 - 272
132	68.7	67.9 - 69.7	74.7	74.0 - 75.4	37	31 - 42	26	22 - 31	171	155 - 189	120	109 - 132
133	67.5	66.4 - 68.5	72.0	71.1 - 72.9	38	33 - 44	34	29 - 39	205	182 - 229	144	127 - 163
134	65.1	64.3 - 65.8	71.7	70.9 - 72.5	39	33 - 45	33	28 - 38	258	238 - 279	133	118 - 151
135	70.6	70.2 - 71.0	78.7	78.4 - 79.0	9	8 - 10	8	7 - 9	204	194 - 215	82	78 - 86
136	73.6	73.1 - 74.0	80.5	80.3 - 80.8	7	6 - 7	5	5 - 6	154	147 - 163	65	62 - 68
137	74.8	73.9 - 75.8	73.8	71.8 - 75.5	14	11 - 18	12	10 - 14	93	84 - 101	77	61 - 98
138	71.8	71.3 - 72.3	79.4	79.2 - 79.6	8	7 - 9	7	7 - 8	166	156 - 176	61	59 - 63
139	64.0	63.3 - 64.8	71.6	71.1 - 72.2	31	23 - 39	23	17 - 29	294	274 - 316	144	132 - 156
140	68.0	67.2 - 68.9	75.0	74.2 - 75.7	22	21 - 24	19	17 - 20	235	212 - 259	108	96 - 121
141	58.4	58.2 - 61.5	72.1	71.4 - 72.6	21	20 - 22	16	15 - 17	464	413 - 510	168	150 - 187
142	41.9	36.5 - 48.1	46.8	39.7 - 53.9	186	170 - 203	170	157 - 184	605	431 - 774	474	283 - 695
143	68.7	67.8 - 69.5	72.2	71.0 - 73.3	20	17 - 23	24	18 - 30	206	188 - 225	148	123 - 175
144	69.8	68.7 - 70.9	74.4	73.0 - 75.7	14	11 - 17	15	12 - 20	211	185 - 238	145	114 - 177
145	67.8	66.5 - 69.1	71.9	70.6 - 73.2	25	21 - 30	20	13 - 30	238	207 - 272	184	160 - 207
146	66.8	66.0 - 67.7	69.7	68.6 - 70.8	27	22 - 31	21	16 - 26	235	219 - 251	203	186 - 221
147	77.2	75.8 - 78.6	84.0	82.5 - 85.7	5	4 - 9	3	3 - 3	85	72 - 99	31	25 - 37
148	61.7	54.2 - 68.8	63.6	54.5 - 70.6	80	62 - 98	82	60 - 104	259	108 - 454	217	95 - 414
149	68.4	64.0 - 72.3	73.9	70.9 - 76.5	30	23 - 37	25	19 - 31	192	120 - 298	112	74 - 163
150	54.3	46.7 - 60.6	57.3	48.3 - 64.5	139	122 - 157	129	112 - 145	349	187 - 560	284	131 - 512
151	69.7	69.3 - 70.1	74.9	74.5 - 75.2	17	16 - 19	13	12 - 15	186	177 - 195	98	93 - 103
152	67.0	66.1 - 67.9	77.2	76.1 - 78.3	15	11 - 18	10	8 - 13	243	219 - 268	113	91 - 138
153	32.4	22.7 - 39.9	35.7	25.0 - 45.4	332	286 - 380	303	255 - 351	682	497 - 898	569	323 - 836
154	77.4	76.4 - 78.4	81.7	81.3 - 82.1	4	4 - 4	3	3 - 3	90	80 - 101	53	49 - 56
155	69.8	69.2 - 70.3	78.3	77.9 - 78.7	9	8 - 11	7	6 - 9	206	195 - 219	79	73 - 84
156	72.8	72.3 - 73.2	80.5	80.2 - 80.8	5	4 - 6	4	4 - 5	163	154 - 172	71	67 - 76
157	63.6	61.5 - 66.2	67.4	65.7 - 69.0	86	73 - 99	75	64 - 86	199	160 - 238	147	127 - 168
158	43.0	35.9 - 48.5	45.7	35.3 - 53.0	218	198 - 239	223	199 - 245	534	388 - 738	418	232 - 676
159	48.8	45.5 - 52.0	52.6	50.0 - 55.0	86	61 - 108	81	55 - 105	598	404 - 818	482	321 - 653
160	76.1	75.6 - 76.7	83.0	82.8 - 83.3	5	5 - 6	5	4 - 5	120	111 - 128	47	45 - 49
161	67.2	65.1 - 69.6	74.3	73.3 - 75.4	20	17 - 23	16	14 - 19	238	186 - 286	121	106 - 136
162	54.9	48.3 - 62.5	59.3	50.6 - 65.6	111	104 - 120	106	97 - 113	379	202 - 559	278	148 - 495
163	64.4	63.0 - 65.9	70.8	69.6 - 72.3	33	29 - 37	28	24 - 31	281	247 - 313	164	137 - 187

Annex Table 1 Basic indicators for all Member States

Figures computed by WHO to assure comparability;[a] they are not necessarily the official statistics of Member States, which may use alternative rigorous methods.

	Member State	POPULATION ESTIMATES								LIFE EXPECTANCY AT BIRTH (YEARS)
		Total population (000)	Annual growth rate (%)	Dependency ratio (per 100)		Percentage of population aged 60+ years		Total fertility rate		Both sexes
		2002	1992–2002	1992	2002	1992	2002	1992	2002	2002
164	Swaziland	1 069	1.9	97	89	4.5	5.1	5.7	4.6	38.8
165	Sweden	8 867	0.2	56	55	22.4	22.9	2.0	1.6	80.4
166	Switzerland	7 171	0.3	46	49	19.4	22.1	1.5	1.4	80.6
167	Syrian Arab Republic	17 381	2.6	98	70	4.2	4.6	4.8	3.4	71.2
168	Tajikistan	6 195	1.2	89	73	6.3	6.7	4.5	3.1	63.7
169	Thailand	62 193	1.1	53	46	6.7	8.8	2.1	1.9	69.3
170	The former Yugoslav Republic of Macedonia	2 046	0.6	50	48	12.2	14.7	1.8	1.9	72.0
171	Timor-Leste	739	-0.7	77	73	3.6	5.2	4.8	3.9	57.5
172	Togo	4 801	2.9	94	89	4.8	4.9	6.2	5.4	51.7
173	Tonga	103	0.3	78	74	7.4	8.2	4.5	3.8	70.7
174	Trinidad and Tobago	1 298	0.5	64	43	8.8	10.0	2.2	1.6	69.9
175	Tunisia	9 728	1.3	71	52	7.4	8.4	3.2	2.0	71.6
176	Turkey	70 318	1.6	67	57	7.2	8.2	3.2	2.5	70.0
177	Turkmenistan	4 794	2.1	79	64	6.2	6.5	4.1	2.7	62.7
178	Tuvalu	10	1.4	71	65	6.2	7.2	3.5	2.9	60.6
179	Uganda	25 004	3.0	105	111	4.1	3.9	7.1	7.1	49.3
180	Ukraine	48 902	-0.6	51	45	18.5	20.8	1.7	1.2	67.2
181	United Arab Emirates	2 937	2.8	42	37	1.8	2.4	3.9	2.9	72.5
182	United Kingdom	59 068	0.3	54	53	21.1	20.8	1.8	1.6	78.2
183	United Republic of Tanzania	36 276	2.6	96	91	3.7	3.9	6.1	5.2	46.5
184	United States of America	291 038	1.1	52	51	16.4	16.2	2.0	2.1	77.3
185	Uruguay	3 391	0.7	60	61	16.7	17.3	2.5	2.3	75.2
186	Uzbekistan	25 705	1.8	81	65	6.5	7.0	3.7	2.5	68.2
187	Vanuatu	207	2.7	90	80	5.3	4.9	4.9	4.2	67.7
188	Venezuela, Bolivarian Republic of	25 226	2.1	70	60	5.9	6.9	3.3	2.7	73.9
189	Viet Nam	80 278	1.5	76	59	7.3	7.4	3.4	2.3	69.6
190	Yemen	19 315	3.9	114	104	3.5	3.6	7.9	7.0	60.4
191	Zambia	10 698	2.1	94	98	4.4	4.7	6.3	5.7	39.7
192	Zimbabwe	12 835	1.5	96	87	4.5	5.1	5.2	4.0	37.9

[a] See explanatory notes for sources and methods.

	LIFE EXPECTANCY AT BIRTH (YEARS)				PROBABILITY OF DYING (PER 1000)							
					Under age 5 years				Between ages 15 and 60 years			
	Males		Females		Males		Females		Males		Females	
	2002	Uncertainty	2002	Uncertainty	2002	Uncertainty	2002	Uncertainty	2002	Uncertainty	2002	Uncertainty
164	36.9	34.2 - 40.7	40.4	35.8 - 44.5	150	132 - 169	142	124 - 159	818	743 - 877	707	627 - 804
165	78.0	77.7 - 78.3	82.6	82.4 - 82.9	4	4 - 5	3	3 - 3	83	80 - 85	53	51 - 55
166	77.7	77.2 - 78.2	83.3	83.1 - 83.6	6	5 - 7	5	4 - 6	92	87 - 98	51	49 - 53
167	68.8	68.0 - 69.7	73.6	73.0 - 74.3	26	24 - 29	20	18 - 22	190	175 - 205	127	117 - 137
168	61.0	59.2 - 62.7	66.5	64.8 - 68.0	68	47 - 90	57	40 - 72	283	231 - 339	172	137 - 216
169	66.0	64.8 - 67.1	72.7	71.7 - 73.8	32	28 - 37	26	22 - 30	279	250 - 311	153	131 - 178
170	69.0	68.3 - 69.7	75.1	74.4 - 75.8	17	16 - 19	15	13 - 16	195	180 - 212	89	81 - 99
171	54.8	46.4 - 62.1	60.5	50.5 - 67.7	142	108 - 178	108	81 - 134	326	162 - 533	242	111 - 463
172	50.0	43.4 - 55.7	53.3	46.0 - 59.8	149	131 - 166	127	110 - 143	459	316 - 636	394	265 - 569
173	70.0	69.5 - 70.5	71.4	70.8 - 72.0	23	20 - 27	15	12 - 18	171	166 - 177	181	174 - 188
174	67.1	66.1 - 68.1	72.8	72.2 - 73.4	24	20 - 28	18	15 - 21	246	221 - 272	153	138 - 169
175	69.5	68.7 - 70.3	73.9	73.0 - 74.7	31	28 - 34	24	21 - 26	167	154 - 180	115	102 - 128
176	67.9	67.1 - 68.8	72.2	71.1 - 73.4	44	40 - 48	42	38 - 46	177	162 - 192	112	94 - 130
177	58.8	58.3 - 59.3	66.9	66.1 - 67.7	63	56 - 69	47	42 - 52	369	349 - 385	193	172 - 215
178	60.0	58.4 - 61.8	61.4	59.7 - 62.9	72	54 - 91	56	43 - 69	298	247 - 345	280	234 - 342
179	47.9	42.3 - 53.2	50.8	43.6 - 56.5	148	142 - 154	136	130 - 142	505	370 - 661	431	306 - 606
180	61.7	61.0 - 62.4	72.9	72.0 - 73.8	22	19 - 24	16	15 - 18	378	343 - 417	139	120 - 161
181	71.3	71.0 - 71.5	75.1	74.9 - 75.3	10	9 - 11	10	9 - 10	169	165 - 174	122	120 - 125
182	75.8	75.3 - 76.3	80.5	79.9 - 81.0	7	6 - 8	6	5 - 6	107	101 - 113	67	61 - 72
183	45.5	44.3 - 46.9	47.5	46.2 - 49.0	163	149 - 177	144	132 - 156	561	534 - 585	512	484 - 536
184	74.6	74.2 - 75.1	79.8	79.7 - 80.0	9	8 - 9	7	7 - 7	140	134 - 148	83	81 - 84
185	71.0	70.5 - 71.6	79.3	79.0 - 79.7	18	15 - 21	13	12 - 14	182	172 - 192	88	84 - 92
186	65.6	64.8 - 66.3	70.8	70.1 - 71.6	37	36 - 39	26	25 - 28	243	224 - 263	152	136 - 169
187	66.4	64.7 - 68.5	69.1	67.4 - 70.9	40	30 - 51	40	30 - 50	217	185 - 245	175	150 - 200
188	71.0	70.2 - 71.8	76.8	76.5 - 77.2	23	21 - 26	19	17 - 21	182	168 - 197	97	92 - 103
189	67.1	66.3 - 68.1	72.2	71.4 - 73.1	41	36 - 46	33	28 - 37	200	184 - 215	129	117 - 140
190	58.7	51.1 - 65.5	62.2	53.8 - 68.7	106	93 - 119	94	82 - 106	286	130 - 498	228	103 - 421
191	39.1	34.5 - 43.6	40.2	35.2 - 45.4	191	170 - 214	176	155 - 195	700	590 - 810	654	546 - 768
192	37.7	35.7 - 40.2	38.0	35.8 - 40.8	115	104 - 125	107	97 - 116	821	776 - 856	789	739 - 828

Annex Table 2 Deaths by cause, sex and mortality stratum in WHO regions,[a] estimates for 2002

Figures computed by WHO to assure comparability;[b] they are not necessarily the official statistics of Member States, which may use alternative rigorous methods.

Cause[d]	SEX[c]						AFRICA		THE AMERICAS		
							Mortality stratum		Mortality stratum		
	Both sexes		Males		Females		High child, high adult	High child, very high adult	Very low child, very low adult	Low child, low adult	High child, high adult
Population (000)	*6 224 985*		*3 131 052*		*3 093 933*		*311 273*	*360 965*	*333 580*	*445 161*	*73 810*
	(000)	% total	(000)	% total	(000)	% total	(000)	(000)	(000)	(000)	(000)
TOTAL Deaths	**57 027**	**100**	**29 949**	**100**	**27 078**	**100**	**4 634**	**6 144**	**2 720**	**2 691**	**547**
I. Communicable diseases, maternal and perinatal conditions and nutritional deficiencies	**18 416**	**32.3**	**9 477**	**31.6**	**8 938**	**33.0**	**3 222**	**4 557**	**167**	**475**	**233**
Infectious and parasitic diseases	11 122	19.5	5 968	19.9	5 154	19.0	2 238	3 549	69	188	137
Tuberculosis	1 605	2.8	1 055	3.5	550	2.0	121	182	1	25	18
STIs excluding HIV	180	0.3	91	0.3	89	0.3	41	52	0	1	1
Syphilis	157	0.3	84	0.3	72	0.3	39	50	0	1	0
Chlamydia	9	0.0	0	0.0	9	0.0	1	0	0	0	0
Gonorrhoea	1	0.0	0	0.0	1	0.0	0	0	0	0	0
HIV/AIDS	2 821	4.9	1 532	5.1	1 290	4.8	456	1 747	14	46	43
Diarrhoeal diseases	1 767	3.1	924	3.1	844	3.1	341	354	2	33	20
Childhood diseases	1 360	2.4	679	2.3	681	2.5	426	295	0	1	6
Pertussis	301	0.5	151	0.5	151	0.6	101	71	0	0	6
Poliomyelitis	1	0.0	0	0.0	0	0.0	0	0	0	0	0
Diphtheria	5	0.0	3	0.0	3	0.0	1	1	0	0	0
Measles	760	1.3	379	1.3	382	1.4	261	178	0	0	0
Tetanus	292	0.5	147	0.5	146	0.5	64	45	0	0	0
Meningitis	173	0.3	90	0.3	83	0.3	8	12	1	8	9
Hepatitis B[e]	103	0.2	71	0.2	32	0.1	10	10	1	3	2
Hepatitis C[e]	53	0.1	35	0.1	18	0.1	4	4	5	2	0
Malaria	1 222	2.1	585	2.0	637	2.4	538	549	0	1	0
Tropical diseases	130	0.2	79	0.3	50	0.2	28	28	0	12	4
Trypanosomiasis	48	0.1	31	0.1	17	0.1	24	23	0	0	0
Chagas disease	14	0.0	8	0.0	7	0.0	0	0	0	11	4
Schistosomiasis	15	0.0	10	0.0	5	0.0	1	1	0	1	0
Leishmaniasis	51	0.1	30	0.1	21	0.1	4	4	0	0	0
Lymphatic filariasis	0	0.0	0	0.0	0	0.0	0	0	0	0	0
Onchocerciasis	0	0.0	0	0.0	0	0.0	0	0	0	0	0
Leprosy	6	0.0	4	0.0	2	0.0	0	0	0	1	0
Dengue	19	0.0	8	0.0	10	0.0	0	0	0	1	1
Japanese encephalitis	14	0.0	7	0.0	7	0.0	0	0	0	0	0
Trachoma	0	0.0	0	0.0	0	0.0	0	0	0	0	0
Intestinal nematode infections	12	0.0	6	0.0	6	0.0	1	2	0	0	1
Ascariasis	3	0.0	1	0.0	2	0.0	0	1	0	0	0
Trichuriasis	3	0.0	2	0.0	1	0.0	0	0	0	0	0
Hookworm disease	3	0.0	2	0.0	1	0.0	1	1	0	0	0
Respiratory infections	3 845	6.7	1 931	6.4	1 914	7.1	533	538	72	107	49
Lower respiratory infections	3 766	6.6	1 890	6.3	1 875	6.9	525	531	72	105	47
Upper respiratory infections	75	0.1	38	0.1	37	0.1	7	6	0	1	2
Otitis media	4	0.0	3	0.0	1	0.0	1	1	0	0	0
Maternal conditions	510	0.9	…	…	510	1.9	102	129	1	9	7
Perinatal conditions	2 464	4.3	1 368	4.6	1 096	4.0	284	270	17	132	26
Nutritional deficiencies	475	0.8	210	0.7	264	1.0	65	72	8	38	14
Protein-energy malnutrition	250	0.4	125	0.4	125	0.5	48	50	5	29	8
Iodine deficiency	7	0.0	3	0.0	3	0.0	0	2	0	0	0
Vitamin A deficiency	23	0.0	11	0.0	12	0.0	10	7	0	0	0
Iron-deficiency anaemia	137	0.2	47	0.2	90	0.3	6	11	3	7	5

Cause[d]	EASTERN MEDITERRANEAN		EUROPE			SOUTH-EAST ASIA		WESTERN PACIFIC	
	Mortality stratum		Mortality stratum			Mortality stratum		Mortality stratum	
	Low child, low adult	High child, high adult	Very low child, very low adult	Low child, low adult	Low child, high adult	Low child, low adult	High child, high adult	Very low child, very low adult	Low child, low adult
Population (000)	*142 528*	*360 296*	*415 323*	*222 846*	*239 717*	*298 234*	*1 292 598*	*155 400*	*1 562 136*
	(000)	(000)	(000)	(000)	(000)	(000)	(000)	(000)	(000)
TOTAL Deaths	**706**	**3 462**	**3 926**	**1 866**	**3 689**	**2 191**	**12 428**	**1 146**	**10 786**
I. Communicable diseases, maternal and perinatal conditions and nutritional deficiencies	**92**	**1 654**	**242**	**166**	**159**	**625**	**5 105**	**136**	**1 565**
Infectious and parasitic diseases	38	921	50	62	100	398	2 570	24	770
Tuberculosis	7	124	5	19	50	157	533	5	355
STIs excluding HIV	0	23	0	0	0	3	55	0	2
Syphilis	0	21	0	0	0	1	42	0	1
Chlamydia	0	1	0	0	0	1	7	0	0
Gonorrhoea	0	0	0	0	0	0	0	0	0
HIV/AIDS	1	49	6	1	36	59	315	0	46
Diarrhoeal diseases	14	236	2	13	2	41	559	1	148
Childhood diseases	0	204	0	7	0	38	328	0	53
Pertussis	0	61	0	0	0	1	60	0	2
Poliomyelitis	0	0	0	0	0	0	0	0	0
Diphtheria	0	0	0	0	0	0	3	0	0
Measles	0	84	0	7	0	31	167	0	32
Tetanus	0	59	0	0	0	6	98	0	19
Meningitis	2	23	2	10	4	9	64	0	20
Hepatitis B[e]	1	9	2	2	1	7	30	1	25
Hepatitis C[e]	1	4	3	1	0	3	11	4	10
Malaria	2	55	0	0	0	12	53	0	11
Tropical diseases	0	15	0	0	0	0	36	0	5
Trypanosomiasis	0	1	0	0	0	0	0	0	0
Chagas disease	0	0	0	0	0	0	0	0	0
Schistosomiasis	0	9	0	0	0	0	0	0	4
Leishmaniasis	0	5	0	0	0	0	36	0	2
Lymphatic filariasis	0	0	0	0	0	0	0	0	0
Onchocerciasis	0	0	0	0	0	0	0	0	0
Leprosy	0	1	0	0	0	1	2	0	1
Dengue	0	1	0	0	0	3	9	0	4
Japanese encephalitis	0	2	0	0	0	0	8	0	3
Trachoma	0	0	0	0	0	0	0	0	0
Intestinal nematode infections	0	1	0	0	0	1	4	0	1
Ascariasis	0	0	0	0	0	0	1	0	1
Trichuriasis	0	0	0	0	0	0	2	0	0
Hookworm disease	0	0	0	0	0	1	0	0	0
Respiratory infections	20	345	174	60	39	108	1 285	108	403
Lower respiratory infections	19	339	171	59	37	105	1 267	107	377
Upper respiratory infections	0	6	3	2	2	3	17	1	26
Otitis media	0	0	0	0	0	0	1	0	0
Maternal conditions	3	65	0	2	1	11	160	0	21
Perinatal conditions	28	275	10	39	17	82	930	2	348
Nutritional deficiencies	4	48	7	3	2	26	161	2	24
Protein-energy malnutrition	2	22	3	1	1	10	56	1	13
Iodine deficiency	0	2	0	0	0	0	1	0	0
Vitamin A deficiency	0	3	0	0	0	0	2	0	0
Iron-deficiency anaemia	1	9	3	2	1	13	67	1	8

Annex Table 2 Deaths by cause, sex and mortality stratum in WHO regions,[a] estimates for 2002

Figures computed by WHO to assure comparability;[b] they are not necessarily the official statistics of Member States, which may use alternative rigorous methods.

Cause[d]	SEX[c]						AFRICA		THE AMERICAS		
							Mortality stratum		Mortality stratum		
	Both sexes		Males		Females		High child, high adult	High child, very high adult	Very low child, very low adult	Low child, low adult	High child, high adult
Population (000)	*6 224 985*		*3 131 052*		*3 093 933*		*311 273*	*360 965*	*333 580*	*445 161*	*73 810*
	(000)	% total	(000)	% total	(000)	% total	(000)	(000)	(000)	(000)	(000)
II. Noncommunicable conditions	**33 424**	**58.6**	**16 992**	**56.7**	**16 432**	**60.7**	**1 068**	**1 184**	**2 380**	**1 895**	**268**
Malignant neoplasms	7 106	12.5	3 963	13.2	3 144	11.6	194	216	641	408	66
Mouth and oropharynx cancers	317	0.6	220	0.7	97	0.4	8	10	10	12	2
Oesophagus cancer	446	0.8	284	0.9	161	0.6	5	17	16	15	1
Stomach cancer	849	1.5	523	1.7	326	1.2	16	18	17	44	13
Colon/rectum cancer	620	1.1	321	1.1	299	1.1	10	10	74	31	4
Liver cancer	619	1.1	428	1.4	191	0.7	22	23	17	17	3
Pancreas cancer	229	0.4	121	0.4	109	0.4	3	5	33	17	2
Trachea/bronchus/lung cancers	1 239	2.2	886	3.0	353	1.3	7	10	179	49	3
Melanoma and other skin cancers	66	0.1	35	0.1	31	0.1	4	4	12	6	1
Breast cancer	477	0.8	3	0.0	474	1.8	21	14	52	33	4
Cervix uteri cancer	239	0.4	…	…	239	0.9	15	23	5	19	7
Corpus uteri cancer	71	0.1	…	…	71	0.3	1	1	9	10	1
Ovary cancer	134	0.2	…	…	134	0.5	3	5	16	7	1
Prostate cancer	268	0.5	268	0.9	…	…	24	17	42	31	5
Bladder cancer	178	0.3	125	0.4	53	0.2	6	5	16	8	1
Lymphomas, multiple myeloma	334	0.6	168	0.6	165	0.6	17	16	45	18	5
Leukaemia	264	0.5	146	0.5	117	0.4	7	6	27	18	3
Other neoplasms	148	0.3	74	0.2	74	0.3	4	5	17	11	1
Diabetes mellitus	987	1.7	440	1.5	547	2.0	35	45	86	151	16
Nutritional/endocrine disorders	243	0.4	108	0.4	135	0.5	12	14	33	25	4
Neuropsychiatric disorders	1 105	1.9	570	1.9	535	2.0	43	47	174	56	10
Unipolar depressive disorders	13	0.0	6	0.0	7	0.0	0	0	1	0	0
Bipolar affective disorder	1	0.0	0	0.0	1	0.0	0	0	0	0	0
Schizophrenia	23	0.0	11	0.0	12	0.0	0	0	1	0	0
Epilepsy	125	0.2	70	0.2	55	0.2	18	20	2	6	2
Alcohol use disorders	86	0.2	73	0.2	13	0.0	3	4	8	14	2
Alzheimer and other dementias	395	0.7	146	0.5	249	0.9	3	4	106	11	1
Parkinson disease	98	0.2	50	0.2	48	0.2	2	3	19	4	1
Multiple sclerosis	16	0.0	6	0.0	10	0.0	0	0	4	1	0
Drug use disorders	88	0.2	72	0.2	16	0.1	2	0	5	2	0
Post-traumatic stress disorder	0	0.0	0	0.0	0	0.0	0	0	0	0	0
Obsessive-compulsive disorder	0	0.0	0	0.0	0	0.0	0	0	0	0	0
Panic disorder	0	0.0	0	0.0	0	0.0	0	0	0	0	0
Insomnia (primary)	0	0.0	0	0.0	0	0.0	0	0	0	0	0
Migraine	0	0.0	0	0.0	0	0.0	0	0	0	0	0
Sense organ disorders	3	0.0	2	0.0	2	0.0	0	0	0	0	0
Glaucoma	0	0.0	0	0.0	0	0.0	0	0	0	0	0
Cataracts	0	0.0	0	0.0	0	0.0	0	0	0	0	0
Vision loss, age-related and other	0	0.0	0	0.0	0	0.0	0	0	0	0	0
Hearing loss, adult onset	0	0.0	0	0.0	0	0.0	0	0	0	0	0
Cardiovascular diseases	16 655	29.2	8 074	27.0	8 581	31.7	496	540	1 031	803	93
Rheumatic heart disease	328	0.6	138	0.5	190	0.7	12	8	4	6	0
Hypertensive heart disease	907	1.6	418	1.4	489	1.8	27	33	47	73	15
Ischaemic heart disease	7 168	12.6	3 779	12.6	3 389	12.5	160	172	574	318	28
Cerebrovascular disease	5 494	9.6	2 540	8.5	2 954	10.9	172	187	187	239	26
Inflammatory heart disease	402	0.7	209	0.7	192	0.7	20	22	35	31	1

Cause[d]	EASTERN MEDITERRANEAN		EUROPE			SOUTH-EAST ASIA		WESTERN PACIFIC	
	Mortality stratum		Mortality stratum			Mortality stratum		Mortality stratum	
	Low child, low adult	High child, high adult	Very low child, very low adult	Low child, low adult	Low child, high adult	Low child, low adult	High child, high adult	Very low child, very low adult	Low child, low adult
Population (000)	*142 528*	*360 296*	*415 323*	*222 846*	*239 717*	*298 234*	*1 292 598*	*155 400*	*1 562 136*
	(000)	(000)	(000)	(000)	(000)	(000)	(000)	(000)	(000)
II. Noncommunicable conditions	**501**	**1 529**	**3 495**	**1 590**	**3 027**	**1 341**	**6 082**	**924**	**8 076**
Malignant neoplasms	76	196	1 040	291	491	267	893	354	1 961
Mouth and oropharynx cancers	2	18	24	9	17	16	133	7	50
Oesophagus cancer	4	12	28	7	13	4	78	12	233
Stomach cancer	12	9	61	28	67	12	51	54	447
Colon/rectum cancer	5	10	138	30	60	28	35	46	139
Liver cancer	6	9	40	12	15	31	30	36	358
Pancreas cancer	2	3	53	12	22	6	13	22	35
Trachea/bronchus/lung cancers	10	17	207	61	94	43	131	65	361
Melanoma and other skin cancers	1	1	15	4	6	1	2	3	4
Breast cancer	4	23	89	21	40	25	68	14	68
Cervix uteri cancer	1	6	8	7	12	14	87	3	31
Corpus uteri cancer	1	1	15	5	11	3	3	3	6
Ovary cancer	1	5	25	7	13	8	19	5	17
Prostate cancer	3	5	69	11	13	8	19	12	9
Bladder cancer	2	17	37	10	13	6	27	6	24
Lymphomas, multiple myeloma	5	15	54	11	10	17	79	15	26
Leukaemia	7	13	36	11	14	13	33	9	65
Other neoplasms	9	15	30	4	4	3	16	10	18
Diabetes mellitus	15	40	92	29	20	72	191	17	174
Nutritional/endocrine disorders	5	24	28	3	3	16	23	9	43
Neuropsychiatric disorders	22	67	185	25	40	53	214	22	143
Unipolar depressive disorders	0	1	2	0	0	1	8	0	0
Bipolar affective disorder	0	0	0	0	0	0	0	0	0
Schizophrenia	0	1	1	0	1	1	13	0	4
Epilepsy	2	8	6	4	4	5	29	1	18
Alcohol use disorders	2	2	13	4	6	3	12	1	11
Alzheimer and other dementias	2	9	96	3	5	9	79	10	56
Parkinson disease	2	2	22	2	1	1	9	4	26
Multiple sclerosis	0	0	4	1	2	0	1	0	1
Drug use disorders	7	24	7	2	11	3	20	1	3
Post-traumatic stress disorder	0	0	0	0	0	0	0	0	0
Obsessive-compulsive disorder	0	0	0	0	0	0	0	0	0
Panic disorder	0	0	0	0	0	0	0	0	0
Insomnia (primary)	0	0	0	0	0	0	0	0	0
Migraine	0	0	0	0	0	0	0	0	0
Sense organ disorders	0	1	0	0	0	0	1	0	0
Glaucoma	0	0	0	0	0	0	0	0	0
Cataracts	0	0	0	0	0	0	0	0	0
Vision loss, age-related and other	0	0	0	0	0	0	0	0	0
Hearing loss, adult onset	0	0	0	0	0	0	0	0	0
Cardiovascular diseases	284	796	1 614	1 051	2 192	600	3 311	369	3 448
Rheumatic heart disease	4	20	10	7	14	12	121	3	107
Hypertensive heart disease	30	67	67	68	40	56	96	8	276
Ischaemic heart disease	143	396	673	464	1 201	265	1 774	126	864
Cerebrovascular disease	54	172	414	283	734	162	897	151	1 807
Inflammatory heart disease	11	26	28	30	41	10	66	7	73

Annex Table 2 Deaths by cause, sex and mortality stratum in WHO regions,[a] estimates for 2002

Figures computed by WHO to assure comparability;[b] they are not necessarily the official statistics of Member States, which may use alternative rigorous methods.

Cause[d]	SEX[c]						AFRICA		THE AMERICAS		
							Mortality stratum		Mortality stratum		
	Both sexes		Males		Females		High child, high adult	High child, very high adult	Very low child, very low adult	Low child, low adult	High child, high adult
Population (000)	*6 224 985*		*3 131 052*		*3 093 933*		*311 273*	*360 965*	*333 580*	*445 161*	*73 810*
	(000)	% total	(000)	% total	(000)	% total	(000)	(000)	(000)	(000)	(000)
Respiratory diseases	3 696	6.5	1 909	6.4	1 788	6.6	124	133	199	175	23
Chronic obstructive pulmonary disease	2 746	4.8	1 411	4.7	1 334	4.9	52	65	141	90	10
Asthma	239	0.4	121	0.4	118	0.4	12	14	6	10	2
Digestive diseases	1 963	3.4	1 091	3.6	872	3.2	75	82	99	153	31
Peptic ulcer disease	265	0.5	155	0.5	110	0.4	7	8	6	11	3
Cirrhosis of the liver	783	1.4	501	1.7	282	1.0	26	28	31	61	13
Appendicitis	21	0.0	12	0.0	10	0.0	1	1	1	2	1
Diseases of the genitourinary system	847	1.5	442	1.5	405	1.5	51	55	66	55	15
Nephritis/nephrosis	677	1.2	345	1.2	332	1.2	47	52	47	43	12
Benign prostatic hypertrophy	31	0.1	31	0.1	…	…	1	1	1	2	0
Skin diseases	69	0.1	26	0.1	43	0.2	10	9	5	6	2
Musculoskeletal diseases	106	0.2	38	0.1	69	0.3	4	3	17	10	2
Rheumatoid arthritis	25	0.0	7	0.0	18	0.1	1	0	3	2	1
Osteoarthritis	5	0.0	2	0.0	3	0.0	0	0	1	1	0
Congenital abnormalities	493	0.9	255	0.9	238	0.9	21	35	13	40	5
Oral diseases	2	0.0	1	0.0	1	0.0	0	0	0	0	0
Dental caries	0	0.0	0	0.0	0	0.0	0	0	0	0	0
Periodontal disease	0	0.0	0	0.0	0	0.0	0	0	0	0	0
Edentulism	0	0.0	0	0.0	0	0.0	0	0	0	0	0
III. Injuries	**5 188**	**9.1**	**3 480**	**11.6**	**1 708**	**6.3**	**344**	**403**	**173**	**321**	**46**
Unintentional	3 562	6.2	2 317	7.7	1 245	4.6	258	230	120	167	33
Road traffic injuries	1 192	2.1	869	2.9	323	1.2	96	99	49	76	10
Poisoning	355	0.6	229	0.8	126	0.5	21	18	14	2	1
Falls	393	0.7	237	0.8	156	0.6	11	9	18	12	1
Fires	311	0.5	120	0.4	191	0.7	24	20	4	3	1
Drowning	385	0.7	264	0.9	121	0.4	36	29	4	15	3
Other unintentional injuries	928	1.6	599	2.0	329	1.2	71	56	30	58	18
Intentional	1 626	2.9	1 164	3.9	462	1.7	86	173	53	154	13
Self-inflicted	877	1.5	549	1.8	328	1.2	15	19	35	26	2
Violence	559	1.0	444	1.5	114	0.4	57	77	17	119	10
War	178	0.3	161	0.5	18	0.1	14	77	0	8	0

[a] See list of Member States by WHO region and mortality stratum.

[b] See explanatory notes for sources and methods.

[c] World totals include residual populations living in overseas territories and areas, or outside any WHO Member State.

[d] Estimates for specific causes may not sum to broader cause groupings owing to omission of residual categories.

[e] Does not include liver cancer and cirrhosis deaths resulting from chronic hepatitis virus infection.

… Data not available or not applicable.

Cause[d]	EASTERN MEDITERRANEAN		EUROPE			SOUTH-EAST ASIA		WESTERN PACIFIC	
	Mortality stratum		Mortality stratum			Mortality stratum		Mortality stratum	
	Low child, low adult	High child, high adult	Very low child, very low adult	Low child, low adult	Low child, high adult	Low child, low adult	High child, high adult	Very low child, very low adult	Low child, low adult
Population (000)	*142 528*	*360 296*	*415 323*	*222 846*	*239 717*	*298 234*	*1 292 598*	*155 400*	*1 562 136*
	(000)	(000)	(000)	(000)	(000)	(000)	(000)	(000)	(000)
Respiratory diseases	27	128	220	72	106	153	721	59	1 550
Chronic obstructive pulmonary disease	15	80	140	45	72	100	556	22	1 354
Asthma	2	14	12	9	20	20	77	6	37
Digestive diseases	22	130	182	77	126	87	415	44	435
Peptic ulcer disease	2	10	17	9	14	15	84	5	75
Cirrhosis of the liver	8	59	65	39	63	34	170	14	171
Appendicitis	0	1	1	0	1	1	7	0	5
Diseases of the genitourinary system	21	62	63	25	24	57	149	27	175
Nephritis/nephrosis	9	56	42	20	14	45	124	24	141
Benign prostatic hypertrophy	1	2	1	1	2	2	11	0	6
Skin diseases	1	4	9	0	3	5	10	1	3
Musculoskeletal diseases	1	2	20	2	4	7	10	6	20
Rheumatoid arthritis	0	0	4	1	1	1	3	2	5
Osteoarthritis	0	0	1	0	0	0	0	0	0
Congenital abnormalities	19	64	11	13	14	20	129	4	104
Oral diseases	0	0	0	0	0	0	0	0	0
Dental caries	0	0	0	0	0	0	0	0	0
Periodontal disease	0	0	0	0	0	0	0	0	0
Edentulism	0	0	0	0	0	0	0	0	0
III. Injuries	**112**	**279**	**190**	**110**	**503**	**225**	**1 242**	**86**	**1 145**
Unintentional	98	196	137	77	334	149	931	48	779
Road traffic injuries	57	75	46	22	60	72	224	14	290
Poisoning	3	12	6	6	103	8	87	1	74
Falls	6	17	47	9	25	15	106	8	108
Fires	7	24	3	3	17	14	170	2	18
Drowning	5	21	4	6	30	14	84	6	126
Other unintentional injuries	19	47	32	30	99	26	261	17	162
Intentional	15	83	53	33	170	76	310	38	366
Self-inflicted	9	25	48	23	93	37	209	37	296
Violence	5	22	4	8	60	28	85	1	65
War	0	35	0	2	17	10	11	0	3

Annex Table 3 Burden of disease in DALYs by cause, sex and mortality stratum in WHO regions,[a] estimates for 2002

Figures computed by WHO to assure comparability;[b] they are not necessarily the official statistics of Member States, which may use alternative rigorous methods.

Cause[d]	SEX[c]						AFRICA		THE AMERICAS		
							Mortality stratum		Mortality stratum		
	Both sexes		Males		Females		High child, high adult	High child, very high adult	Very low child, very low adult	Low child, low adult	High child, high adult
Population (000)	*6 224 985*		*3 131 052*		*3 093 933*		*311 273*	*360 965*	*333 580*	*445 161*	*73 810*
	(000)	% total	(000)	% total	(000)	% total	(000)	(000)	(000)	(000)	(000)
TOTAL DALYs	1 491 416	100	775 331	100	716 085	100	159 496	204 605	46 868	81 429	17 323
I. Communicable diseases, maternal and perinatal conditions and nutritional deficiencies	612 194	41.0	299 497	38.6	312 696	43.7	114 397	153 843	3 106	16 167	7 404
Infectious and parasitic diseases	356 824	23.9	184 338	23.8	172 486	24.1	77 530	115 544	1 228	6 549	4 074
Tuberculosis	35 361	2.4	22 274	2.9	13 087	1.8	3 277	4 953	12	502	388
STIs excluding HIV	11 348	0.8	3 855	0.5	7 493	1.0	1 930	2 444	75	487	69
Syphilis	4 200	0.3	1 970	0.3	2 230	0.3	1 028	1 417	2	56	20
Chlamydia	3 571	0.2	302	0.0	3 269	0.5	364	428	55	241	15
Gonorrhoea	3 365	0.2	1 473	0.2	1 892	0.3	520	573	16	183	31
HIV/AIDS	86 072	5.8	45 249	5.8	40 824	5.7	13 966	52 806	454	1 472	1 294
Diarrhoeal diseases	61 095	4.1	31 943	4.1	29 152	4.1	11 270	11 722	106	1 481	706
Childhood diseases	49 844	3.3	24 817	3.2	25 027	3.5	15 315	10 663	54	180	255
Pertussis	13 052	0.9	6 500	0.8	6 552	0.9	3 948	2 841	52	165	237
Poliomyelitis	152	0.0	77	0.0	75	0.0	11	4	3	6	1
Diphtheria	184	0.0	96	0.0	88	0.0	24	24	0	2	7
Measles	27 058	1.8	13 450	1.7	13 607	1.9	9 250	6 317	0	0	0
Tetanus	9 398	0.6	4 694	0.6	4 704	0.7	2 081	1 477	0	8	10
Meningitis	6 195	0.4	3 087	0.4	3 108	0.4	394	497	43	356	280
Hepatitis B[e]	2 177	0.1	1 465	0.2	712	0.1	302	280	20	55	38
Hepatitis C[e]	1 001	0.1	668	0.1	333	0.0	120	122	77	29	1
Malaria	44 716	3.0	21 499	2.8	23 217	3.2	19 429	19 736	0	86	24
Tropical diseases	12 255	0.8	8 278	1.1	3 978	0.6	2 939	2 752	9	604	178
Trypanosomiasis	1 535	0.1	971	0.1	563	0.1	744	750	0	0	0
Chagas disease	667	0.0	343	0.0	324	0.0	0	0	8	483	171
Schistosomiasis	1 702	0.1	1 021	0.1	681	0.1	621	713	0	74	0
Leishmaniasis	2 090	0.1	1 249	0.2	840	0.1	208	175	1	38	5
Lymphatic filariasis	5 777	0.4	4 413	0.6	1 364	0.2	976	1 035	0	9	1
Onchocerciasis	484	0.0	280	0.0	204	0.0	390	80	0	1	1
Leprosy	199	0.0	117	0.0	82	0.0	12	11	0	18	0
Dengue	616	0.0	279	0.0	337	0.0	1	4	0	31	38
Japanese encephalitis	709	0.0	338	0.0	371	0.1	0	0	0	0	0
Trachoma	2 329	0.2	597	0.1	1 732	0.2	486	726	0	162	2
Intestinal nematode infections	2 951	0.2	1 490	0.2	1 461	0.2	809	329	1	66	101
Ascariasis	1 817	0.1	910	0.1	907	0.1	714	144	0	23	39
Trichuriasis	1 006	0.1	519	0.1	488	0.1	78	155	1	42	29
Hookworm disease	59	0.0	31	0.0	27	0.0	17	29	0	0	0
Respiratory infections	90 252	6.1	45 945	5.9	44 306	6.2	16 569	16 134	390	1 872	1 120
Lower respiratory infections	87 022	5.8	44 316	5.7	42 707	6.0	16 218	15 802	337	1 717	1 055
Upper respiratory infections	1 795	0.1	875	0.1	920	0.1	229	191	14	43	41
Otitis media	1 434	0.1	755	0.1	680	0.1	122	141	38	112	24
Maternal conditions	33 625	2.3	…	…	33 625	4.7	5 200	6 549	215	1 153	544
Perinatal conditions	97 423	6.5	53 265	6.9	44 158	6.2	10 869	10 485	781	5 537	1 098
Nutritional deficiencies	34 070	2.3	15 949	2.1	18 121	2.5	4 229	5 131	493	1 054	569
Protein-energy malnutrition	16 565	1.1	8 430	1.1	8 135	1.1	2 629	2 906	36	649	258
Iodine deficiency	3 519	0.2	1 759	0.2	1 760	0.2	261	868	7	97	33
Vitamin A deficiency	793	0.1	364	0.0	428	0.1	347	248	0	0	1
Iron-deficiency anaemia	12 224	0.8	4 998	0.6	7 226	1.0	975	1 089	446	274	268

Cause[d]	EASTERN MEDITERRANEAN		EUROPE			SOUTH-EAST ASIA		WESTERN PACIFIC	
	Mortality stratum		Mortality stratum			Mortality stratum		Mortality stratum	
	Low child, low adult	High child, high adult	Very low child, very low adult	Low child, low adult	Low child, high adult	Low child, low adult	High child, high adult	Very low child, very low adult	Low child, low adult
	142 528	*360 296*	*415 323*	*222 846*	*239 717*	*298 234*	*1 292 598*	*155 400*	*1 562 136*
	(000)	(000)	(000)	(000)	(000)	(000)	(000)	(000)	(000)
TOTAL DALYs	**24 079**	**115 449**	**51 734**	**37 701**	**60 340**	**62 451**	**363 035**	**16 343**	**248 256**
I. Communicable diseases, maternal and perinatal conditions and nutritional deficiencies	**4 444**	**60 373**	**2 551**	**6 177**	**5 442**	**18 521**	**165 042**	**1 011**	**53 118**
Infectious and parasitic diseases	1 523	31 197	891	2 106	3 142	10 915	78 252	322	23 258
Tuberculosis	140	2 736	47	444	1 162	3 530	12 199	41	5 907
STIs excluding HIV	144	1 327	79	149	125	479	3 475	34	515
Syphilis	3	706	3	6	5	35	860	1	54
Chlamydia	100	309	61	95	79	262	1 251	25	281
Gonorrhoea	39	296	15	43	39	164	1 261	7	172
HIV/AIDS	43	1 557	201	40	1 379	1 502	9 332	8	1 957
Diarrhoeal diseases	564	7 800	110	485	108	1 481	18 695	44	6 481
Childhood diseases	58	7 330	66	320	29	1 464	11 821	34	2 224
Pertussis	39	2 420	64	61	25	155	2 572	33	429
Poliomyelitis	4	13	1	3	0	9	56	0	43
Diphtheria	0	16	0	1	1	7	96	0	6
Measles	9	2 979	1	254	2	1 102	5 958	1	1 169
Tetanus	5	1 903	0	1	1	191	3 138	0	577
Meningitis	84	1 134	67	326	89	219	1 906	11	781
Hepatitis B[e]	24	166	17	54	24	143	576	18	459
Hepatitis C[e]	12	69	36	19	11	67	212	34	189
Malaria	92	2 112	1	18	0	502	2 253	0	433
Tropical diseases	45	601	0	7	0	251	4 334	0	516
Trypanosomiasis	0	39	0	0	0	0	0	0	0
Chagas disease	0	0	0	0	0	0	0	0	0
Schistosomiasis	30	197	0	1	0	3	4	0	55
Leishmaniasis	16	232	0	6	0	6	1 352	0	50
Lymphatic filariasis	0	122	0	1	0	242	2 977	0	411
Onchocerciasis	0	10	0	0	0	0	0	0	0
Leprosy	0	25	0	0	0	13	105	0	13
Dengue	10	20	0	0	0	89	292	0	131
Japanese encephalitis	0	83	0	0	0	29	277	0	320
Trachoma	91	283	0	0	0	0	168	0	400
Intestinal nematode infections	1	225	0	1	0	135	669	2	611
Ascariasis	0	158	0	0	0	63	346	1	325
Trichuriasis	0	60	0	0	0	63	305	1	272
Hookworm disease	0	2	0	0	0	8	1	0	1
Respiratory infections	559	10 458	690	1 437	625	1 499	30 286	372	8 165
Lower respiratory infections	511	10 140	626	1 340	534	1 382	29 635	350	7 302
Upper respiratory infections	10	202	27	62	66	45	301	9	552
Otitis media	38	116	37	35	24	72	350	13	310
Maternal conditions	412	4 104	167	371	265	1 004	10 390	67	3 146
Perinatal conditions	1 319	10 817	499	1 592	681	3 414	35 733	123	14 321
Nutritional deficiencies	631	3 798	304	671	730	1 688	10 381	128	4 229
Protein-energy malnutrition	174	1 807	24	109	55	698	5 338	18	1 846
Iodine deficiency	121	623	3	241	449	81	571	0	163
Vitamin A deficiency	0	90	0	1	0	1	100	0	5
Iron-deficiency anaemia	334	928	271	297	200	891	3 959	106	2 171

Annex Table 3 Burden of disease in DALYs by cause, sex and mortality stratum in WHO regions,[a] estimates for 2002

Figures computed by WHO to assure comparability;[b] they are not necessarily the official statistics of Member States, which may use alternative rigorous methods.

Cause[d]	SEX[c]						AFRICA		THE AMERICAS		
							Mortality stratum		Mortality stratum		
	Both sexes		Males		Females		High child, high adult	High child, very high adult	Very low child, very low adult	Low child, low adult	High child, high adult
Population (000)	*6 224 985*		*3 131 052*		*3 093 933*		*311 273*	*360 965*	*333 580*	*445 161*	*73 810*
	(000)	% total	(000)	% total	(000)	% total	(000)	(000)	(000)	(000)	(000)
II. Noncommunicable conditions	**696 632**	**46.7**	**355 416**	**45.8**	**341 216**	**47.7**	**30 124**	**34 727**	**39 217**	**51 833**	**8 030**
Malignant neoplasms	75 407	5.1	40 432	5.2	34 975	4.9	2 238	2 517	5 830	4 554	749
Mouth and oropharynx cancers	3 560	0.2	2 563	0.3	997	0.1	83	111	97	135	16
Esophagus cancer	4 247	0.3	2 762	0.4	1 486	0.2	52	178	136	140	9
Stomach cancer	8 087	0.5	5 037	0.6	3 050	0.4	174	196	132	403	123
Colon/rectum cancer	5 802	0.4	3 111	0.4	2 691	0.4	118	102	654	295	40
Liver cancer	7 146	0.5	5 046	0.7	2 100	0.3	301	305	141	164	32
Pancreas cancer	1 962	0.1	1 104	0.1	858	0.1	34	56	247	149	17
Trachea/bronchus/lung cancers	11 189	0.8	7 915	1.0	3 274	0.5	71	112	1 398	453	28
Melanoma and other skin cancers	688	0.0	380	0.0	308	0.0	34	44	135	66	7
Breast cancer	6 165	0.4	23	0.0	6 142	0.9	258	164	687	439	55
Cervix uteri cancer	3 284	0.2	…	…	3 284	0.5	185	282	102	299	101
Corpus uteri cancer	1 121	0.1	…	…	1 121	0.2	12	16	161	178	16
Ovary cancer	1 632	0.1	…	…	1 632	0.2	44	68	156	102	18
Prostate cancer	1 621	0.1	1 621	0.2	…	…	147	109	281	167	27
Bladder cancer	1 473	0.1	996	0.1	476	0.1	55	41	135	56	7
Lymphomas, multiple myeloma	4 303	0.3	2 295	0.3	2 008	0.3	291	262	368	246	68
Leukaemia	4 680	0.3	2 650	0.3	2 030	0.3	104	109	251	361	76
Other neoplasms	1 746	0.1	910	0.1	835	0.1	74	86	114	139	20
Diabetes mellitus	16 191	1.1	7 605	1.0	8 586	1.2	529	586	1 455	1 836	224
Nutritional/endocrine disorders	7 966	0.5	3 560	0.5	4 406	0.6	570	720	854	1 160	224
Neuropsychiatric disorders	193 136	12.9	94 119	12.1	99 017	13.8	8 242	9 655	13 888	18 966	2 934
Unipolar depressive disorders	67 295	4.5	26 743	3.4	40 551	5.7	2 011	2 316	5 237	5 863	898
Bipolar affective disorder	13 952	0.9	7 049	0.9	6 903	1.0	795	936	531	1 063	177
Schizophrenia	16 144	1.1	8 232	1.1	7 912	1.1	777	899	537	1 268	210
Epilepsy	7 327	0.5	3 883	0.5	3 443	0.5	701	880	175	745	143
Alcohol use disorders	20 247	1.4	17 168	2.2	3 079	0.4	241	672	2 502	3 514	333
Alzheimer and other dementias	10 383	0.7	3 983	0.5	6 400	0.9	166	175	1 300	658	76
Parkinson disease	1 554	0.1	772	0.1	783	0.1	35	40	252	53	7
Multiple sclerosis	1 475	0.1	637	0.1	838	0.1	56	45	120	105	16
Drug use disorders	7 413	0.5	5 807	0.7	1 606	0.2	660	656	787	839	232
Post-traumatic stress disorder	3 335	0.2	923	0.1	2 412	0.3	149	173	184	209	32
Obsessive-compulsive disorder	4 923	0.3	2 116	0.3	2 808	0.4	393	459	227	558	87
Panic disorder	6 758	0.5	2 292	0.3	4 466	0.6	360	427	278	512	85
Insomnia (primary)	3 477	0.2	1 494	0.2	1 983	0.3	141	161	269	326	49
Migraine	7 666	0.5	2 078	0.3	5 588	0.8	193	254	508	754	150
Sense organ disorders	69 380	4.7	32 452	4.2	36 928	5.2	4 289	4 649	1 950	3 638	528
Glaucoma	3 866	0.3	1 716	0.2	2 150	0.3	451	481	35	219	11
Cataracts	25 251	1.7	11 051	1.4	14 200	2.0	2 483	2 670	123	1 156	248
Vision loss, age-related and other	14 191	1.0	6 303	0.8	7 889	1.1	437	440	414	1 116	119
Hearing loss, adult onset	26 034	1.7	13 364	1.7	12 669	1.8	918	1 058	1 377	1 144	148
Cardiovascular diseases	147 541	9.9	79 427	10.2	68 114	9.5	5 187	5 724	6 847	7 427	901
Rheumatic heart disease	5 872	0.4	2 560	0.3	3 313	0.5	300	207	40	107	11
Hypertensive heart disease	7 622	0.5	3 846	0.5	3 776	0.5	260	327	322	581	126
Ischaemic heart disease	58 334	3.9	34 138	4.4	24 196	3.4	1 461	1 564	3 304	2 685	230
Cerebrovascular disease	49 118	3.3	25 347	3.3	23 770	3.3	1 757	1 911	1 654	2 534	288
Inflammatory heart disease	5 818	0.4	3 410	0.4	2 408	0.3	400	467	382	437	27

Cause[d]	EASTERN MEDITERRANEAN		EUROPE			SOUTH-EAST ASIA		WESTERN PACIFIC	
	Mortality stratum		Mortality stratum			Mortality stratum		Mortality stratum	
	Low child, low adult	High child, high adult	Very low child, very low adult	Low child, low adult	Low child, high adult	Low child, low adult	High child, high adult	Very low child, very low adult	Low child, low adult
	142 528	*360 296*	*415 323*	*222 846*	*239 717*	*298 234*	*1 292 598*	*155 400*	*1 562 136*
	(000)	(000)	(000)	(000)	(000)	(000)	(000)	(000)	(000)
II. Noncommunicable conditions	**14 872**	**42 361**	**45 110**	**27 461**	**41 718**	**35 713**	**150 663**	**13 675**	**159 791**
Malignant neoplasms	983	2 835	8 557	3 295	5 173	3 231	10 511	2 782	22 035
Mouth and oropharynx cancers	24	226	264	109	204	198	1 407	59	624
Esophagus cancer	34	133	234	72	121	34	764	95	2 242
Stomach cancer	117	124	422	283	633	114	516	373	4 469
Colon/rectum cancer	58	138	1 029	287	533	295	365	390	1 488
Liver cancer	63	113	282	115	146	347	431	265	4 432
Pancreas cancer	17	32	378	111	205	65	131	152	365
Trachea/bronchus/lung cancers	98	183	1 670	619	920	419	1 324	429	3 452
Melanoma and other skin cancers	10	21	147	47	70	12	28	24	40
Breast cancer	76	348	939	278	479	367	835	197	1 029
Cervix uteri cancer	20	97	111	112	167	226	1 171	43	364
Corpus uteri cancer	13	21	206	91	155	44	32	63	111
Ovary cancer	16	75	238	90	160	129	225	58	250
Prostate cancer	25	37	370	70	95	49	116	70	56
Bladder cancer	19	178	243	81	109	50	277	40	178
Lymphomas, multiple myeloma	76	326	428	168	131	236	1 161	117	416
Leukaemia	147	328	316	196	193	257	791	94	1 450
Other neoplasms	128	240	185	36	62	49	281	67	261
Diabetes mellitus	412	843	1 106	566	516	1 245	3 562	386	2 873
Nutritional/endocrine disorders	209	633	631	174	173	449	637	218	1 278
Neuropsychiatric disorders	4 342	10 680	13 733	7 058	8 431	8 340	39 974	3 795	42 722
Unipolar depressive disorders	1 259	3 754	4 117	2 626	2 598	2 897	17 671	1 007	14 926
Bipolar affective disorder	380	869	618	479	449	704	2 994	237	3 697
Schizophrenia	471	1 037	593	577	437	1 047	3 683	231	4 348
Epilepsy	123	502	245	191	186	367	1 883	65	1 105
Alcohol use disorders	55	44	2 227	636	1 715	325	1 623	488	5 836
Alzheimer and other dementias	101	242	1 989	399	535	369	1 213	764	2 374
Parkinson disease	40	59	289	71	84	36	211	108	268
Multiple sclerosis	35	75	157	63	86	63	276	29	347
Drug use disorders	562	812	774	192	515	159	827	57	322
Post-traumatic stress disorder	84	192	208	127	130	181	719	81	860
Obsessive-compulsive disorder	191	349	257	275	277	172	837	62	765
Panic disorder	186	428	322	248	239	363	1 494	124	1 680
Insomnia (primary)	35	161	348	119	158	118	861	130	595
Migraine	136	421	742	258	236	340	1 727	151	1 781
Sense organ disorders	2 108	5 016	2 465	1 589	2 166	6 151	16 217	809	17 655
Glaucoma	216	512	107	91	102	209	195	16	1 207
Cataracts	570	1 873	112	149	167	3 479	7 562	29	4 581
Vision loss, age-related and other	757	1 127	390	588	633	813	1 418	141	5 755
Hearing loss, adult onset	564	1 497	1 855	760	1 261	1 648	7 029	623	6 109
Cardiovascular diseases	2 952	9 115	8 847	8 172	16 815	6 576	36 411	2 472	29 868
Rheumatic heart disease	101	476	71	123	202	242	2 376	18	1 594
Hypertensive heart disease	254	642	307	522	358	518	1 138	37	2 209
Ischaemic heart disease	1 376	3 956	3 572	3 380	8 511	2 804	17 930	737	6 732
Cerebrovascular disease	576	1 954	2 656	2 518	5 540	1 681	8 714	1 225	16 048
Inflammatory heart disease	133	423	265	360	651	173	1 338	72	678

Annex Table 3 Burden of disease in DALYs by cause, sex and mortality stratum in WHO regions,[a] estimates for 2002

Figures computed by WHO to assure comparability;[b] they are not necessarily the official statistics of Member States, which may use alternative rigorous methods.

Cause[d]	SEX[c]						AFRICA		THE AMERICAS		
							Mortality stratum		Mortality stratum		
	Both sexes		Males		Females		High child, high adult	High child, very high adult	Very low child, very low adult	Low child, low adult	High child, high adult
Population (000)	*6 224 985*		*3 131 052*		*3 093 933*		*311 273*	*360 965*	*333 580*	*445 161*	*73 810*
	(000)	% total	(000)	% total	(000)	% total	(000)	(000)	(000)	(000)	(000)
Respiratory diseases	55 060	3.7	30 198	3.9	24 862	3.5	2 505	2 978	3 239	4 062	668
Chronic obstructive pulmonary disease	27 708	1.9	15 275	2.0	12 433	1.7	514	668	1 743	1 420	195
Asthma	15 325	1.0	8 233	1.1	7 092	1.0	952	1 260	792	1 576	278
Digestive diseases	46 300	3.1	25 279	3.3	21 022	2.9	2 377	2 727	1 589	3 313	645
Peptic ulcer disease	4 644	0.3	2 938	0.4	1 706	0.2	151	176	52	136	37
Cirrhosis of the liver	13 909	0.9	8 587	1.1	5 322	0.7	447	510	485	1 099	206
Appendicitis	393	0.0	227	0.0	166	0.0	23	26	15	39	16
Diseases of the genitourinary system	15 214	1.0	8 577	1.1	6 637	0.9	986	1 101	631	1 091	244
Nephritis/nephrosis	8 390	0.6	4 441	0.6	3 948	0.6	620	681	265	496	148
Benign prostatic hypertrophy	2 460	0.2	2 460	0.3	…	…	113	126	88	210	29
Skin diseases	3 749	0.3	1 854	0.2	1 895	0.3	395	452	79	323	68
Musculoskeletal diseases	30 168	2.0	13 242	1.7	16 926	2.4	1 080	1 151	1 751	2 223	311
Rheumatoid arthritis	4 867	0.3	1 385	0.2	3 482	0.5	133	143	332	550	86
Osteoarthritis	14 861	1.0	5 797	0.7	9 065	1.3	595	641	860	857	102
Congenital abnormalities	27 402	1.8	14 142	1.8	13 260	1.9	1 384	2 072	682	2 277	364
Oral diseases	7 372	0.5	3 618	0.5	3 754	0.5	269	311	308	824	150
Dental caries	4 769	0.3	2 414	0.3	2 355	0.3	186	216	183	715	132
Periodontal disease	302	0.0	152	0.0	150	0.0	15	17	13	21	3
Edentulism	2 185	0.1	1 015	0.1	1 170	0.2	64	72	109	80	13
III. Injuries	**182 591**	**12.2**	**120 418**	**15.5**	**62 172**	**8.7**	**14 974**	**16 034**	**4 545**	**13 429**	**1 889**
Unintentional	133 468	8.9	84 434	10.9	49 033	6.8	11 621	9 918	3 133	6 810	1 451
Road traffic injuries	38 660	2.6	27 218	3.5	11 441	1.6	3 654	3 537	1 368	2 579	348
Poisoning	7 519	0.5	4 928	0.6	2 591	0.4	577	490	333	64	16
Falls	16 232	1.1	9 956	1.3	6 276	0.9	612	456	371	645	131
Fires	11 481	0.8	4 609	0.6	6 872	1.0	1 090	897	100	132	37
Drowning	10 893	0.7	7 502	1.0	3 391	0.5	1 065	853	116	455	81
Other unintentional injuries	48 682	3.3	30 221	3.9	18 461	2.6	4 623	3 686	844	2 936	838
Intentional	49 123	3.3	35 984	4.6	13 139	1.8	3 353	6 116	1 412	6 619	437
Self-inflicted	20 836	1.4	12 403	1.6	8 432	1.2	391	505	772	652	77
Violence	21 427	1.4	17 499	2.3	3 928	0.5	2 343	2 952	629	5 659	358
War	6 505	0.4	5 792	0.7	713	0.1	619	2 659	1	283	2

[a] See list of Member States by WHO region and mortality stratum.

[b] See explanatory notes for sources and methods.

[c] World totals include residual populations living in overseas territories and areas, or outside any WHO Member State.

[d] Estimates for specific causes may not sum to broader cause groupings owing to omission of residual categories.

[e] Does not include liver cancer and cirrhosis deaths resulting from chronic hepatitis virus infection.

… Data not available or not applicable.

Cause[d]	EASTERN MEDITERRANEAN		EUROPE			SOUTH-EAST ASIA		WESTERN PACIFIC	
	Mortality stratum		Mortality stratum			Mortality stratum		Mortality stratum	
	Low child, low adult	High child, high adult	Very low child, very low adult	Low child, low adult	Low child, high adult	Low child, low adult	High child, high adult	Very low child, very low adult	Low child, low adult
	142 528	*360 296*	*415 323*	*222 846*	*239 717*	*298 234*	*1 292 598*	*155 400*	*1 562 136*
	(000)	(000)	(000)	(000)	(000)	(000)	(000)	(000)	(000)
Respiratory diseases	840	2 877	3 407	1 552	1 718	2 620	13 010	1 034	14 469
Chronic obstructive pulmonary disease	346	989	1 745	674	1 001	1 420	6 740	403	9 820
Asthma	280	1 006	700	358	288	614	3 821	365	3 007
Digestive diseases	687	3 353	2 415	1 903	2 905	2 534	11 671	650	9 448
Peptic ulcer disease	34	230	129	149	227	229	1 809	33	1 249
Cirrhosis of the liver	124	1 021	909	651	1 108	666	3 676	174	2 814
Appendicitis	6	16	16	10	20	18	94	5	89
Diseases of the genitourinary system	375	1 175	547	540	638	905	3 180	220	3 529
Nephritis/nephrosis	112	785	197	261	205	549	1 984	95	1 978
Benign prostatic hypertrophy	59	138	123	65	75	125	539	51	714
Skin diseases	67	270	90	67	174	332	745	21	659
Musculoskeletal diseases	518	1 278	2 197	1 513	1 925	1 593	5 334	877	8 359
Rheumatoid arthritis	101	228	427	277	345	122	880	142	1 090
Osteoarthritis	216	548	1 187	828	1 073	893	2 302	526	4 208
Congenital abnormalities	942	3 464	553	686	707	1 170	7 540	204	5 294
Oral diseases	312	583	378	311	315	517	1 590	142	1 341
Dental caries	197	382	201	194	163	253	1 088	75	771
Periodontal disease	5	19	17	11	13	15	100	6	47
Edentulism	106	174	157	105	138	239	376	59	488
III. Injuries	**4 763**	**12 714**	**4 073**	**4 062**	**13 180**	**8 217**	**47 330**	**1 656**	**35 347**
Unintentional	4 214	9 768	3 036	3 127	8 716	5 866	37 872	947	26 732
Road traffic injuries	1 836	2 732	1 227	643	1 747	2 415	7 601	302	8 595
Poisoning	74	266	126	126	2 004	156	1 668	36	1 572
Falls	509	1 212	615	482	971	669	5 037	176	4 316
Fires	292	1 091	57	153	439	459	6 095	25	603
Drowning	154	651	73	167	706	397	2 343	63	3 751
Other unintentional injuries	1 350	3 815	937	1 558	2 848	1 770	15 128	345	7 895
Intentional	549	2 946	1 037	935	4 464	2 351	9 459	709	8 614
Self-inflicted	261	749	889	533	1 981	961	6 230	668	6 152
Violence	244	1 031	134	256	1 876	936	2 644	38	2 260
War	26	1 115	14	130	605	437	437	2	139

Annex Table 4 Healthy life expectancy (HALE) in all Member States, estimates for 2002

Figures computed by WHO to assure comparability;[a] they are not necessarily the official statistics of Member States, which may use alternative rigorous methods.

	Member State	Healthy life expectancy (HALE) (years)									Expectation of lost healthy years at birth (years)		Percentage of total life expectancy lost	
		Total population	Males				Females							
		At birth	At birth	Uncertainty interval	At age 60	Uncertainty interval	At birth	Uncertainty interval	At age 60	Uncertainty interval	Males	Females	Males	Females
1	Afghanistan	35.5	35.3	26.7 - 40.4	8.6	8.0 - 9.1	35.8	26.3 - 43.5	9.5	9.0 - 10.2	6.6	7.7	15.8	17.7
2	Albania	61.4	59.5	58.0 - 60.8	10.5	9.6 - 11.2	63.3	61.7 - 63.9	13.9	13.1 - 14.6	7.8	10.8	11.6	14.6
3	Algeria	60.6	59.7	58.2 - 61.1	12.5	12.2 - 12.8	61.6	60.4 - 63.2	13.3	12.9 - 13.6	7.9	9.6	11.7	13.5
4	Andorra	72.2	69.8	68.5 - 70.7	16.6	15.9 - 16.9	74.6	73.7 - 75.5	19.9	19.4 - 20.3	7.0	9.1	9.2	10.8
5	Angola	33.4	31.6	25.0 - 36.4	8.1	7.6 - 8.7	35.1	28.1 - 42.1	9.6	9.2 - 10.6	6.3	6.9	16.6	16.4
6	Antigua and Barbuda	61.9	60.1	58.6 - 61.7	11.6	11.3 - 12.0	63.6	62.4 - 65.3	13.8	13.4 - 14.3	8.9	10.3	12.8	13.9
7	Argentina	65.3	62.5	61.8 - 63.2	13.0	12.8 - 13.2	68.1	67.5 - 68.8	16.5	16.3 - 16.7	8.3	10.0	11.7	12.8
8	Armenia	61.0	59.4	58.3 - 60.5	10.9	10.5 - 11.3	62.6	61.1 - 63.1	13.3	12.3 - 13.8	7.6	10.4	11.3	14.2
9	Australia	72.6	70.9	70.2 - 71.4	16.9	16.6 - 17.1	74.3	73.7 - 75.1	19.5	19.2 - 19.8	7.0	8.7	9.0	10.4
10	Austria	71.4	69.3	68.6 - 70.0	16.2	16.0 - 16.5	73.5	72.9 - 74.3	19.3	19.0 - 19.6	7.1	8.6	9.3	10.5
11	Azerbaijan	57.2	55.8	54.5 - 57.2	10.6	10.3 - 10.9	58.7	57.0 - 59.4	12.4	11.8 - 12.9	7.2	10.0	11.4	14.6
12	Bahamas	63.3	60.9	59.6 - 62.0	13.3	13.0 - 13.7	65.7	64.6 - 66.9	15.6	15.0 - 16.3	8.1	9.5	11.7	12.6
13	Bahrain	64.3	64.2	63.2 - 65.5	11.5	10.6 - 12.7	64.4	63.6 - 65.8	11.6	11.1 - 12.6	7.9	10.1	10.9	13.6
14	Bangladesh	54.3	55.3	54.0 - 56.7	11.1	10.8 - 11.5	53.3	52.2 - 54.7	11.1	10.8 - 11.4	7.3	9.3	11.7	14.8
15	Barbados	65.6	62.9	61.9 - 64.1	13.1	12.8 - 13.5	68.2	67.0 - 69.5	16.6	16.1 - 17.2	7.6	9.8	10.7	12.5
16	Belarus	60.7	56.6	55.7 - 57.5	10.5	10.1 - 10.9	64.9	63.6 - 65.5	14.6	14.3 - 14.9	6.1	9.4	9.7	12.6
17	Belgium	71.1	68.9	68.3 - 69.5	15.7	15.4 - 15.9	73.3	72.8 - 74.1	19.1	18.9 - 19.4	6.3	8.2	8.3	10.1
18	Belize	60.3	58.4	57.0 - 59.8	11.5	11.2 - 11.8	62.2	61.2 - 63.4	13.3	13.0 - 13.6	9.0	10.2	13.3	14.1
19	Benin	44.0	43.4	37.6 - 48.5	9.7	8.8 - 10.8	44.5	37.4 - 50.9	10.4	9.5 - 11.6	6.6	7.9	13.3	15.0
20	Bhutan	52.9	52.9	46.3 - 58.8	10.8	9.6 - 12.6	52.9	45.5 - 57.5	11.3	10.0 - 12.3	7.3	9.5	12.1	15.2
21	Bolivia	54.4	53.6	47.5 - 59.2	10.9	9.5 - 12.6	55.2	47.8 - 59.6	12.1	10.6 - 13.3	8.2	9.4	13.2	14.6
22	Bosnia and Herzegovina	64.3	62.3	60.8 - 63.9	12.4	12.0 - 13.0	66.4	64.7 - 67.2	15.4	15.0 - 16.0	7.0	10.0	10.2	13.1
23	Botswana	35.7	36.0	34.4 - 40.0	10.9	10.7 - 13.0	35.4	33.9 - 39.5	11.9	11.7 - 13.5	4.2	5.2	10.4	12.9
24	Brazil	59.8	57.2	56.3 - 58.0	11.6	11.4 - 11.8	62.4	61.7 - 63.3	13.7	13.4 - 13.9	8.5	9.8	13.0	13.6
25	Brunei Darussalam	65.3	65.1	63.8 - 66.4	13.1	12.5 - 13.8	65.5	64.7 - 66.6	13.3	13.0 - 13.7	9.7	11.9	13.0	15.4
26	Bulgaria	64.6	62.5	61.6 - 63.3	12.4	12.1 - 12.7	66.8	66.0 - 67.7	14.9	14.6 - 15.3	6.2	8.5	9.1	11.3
27	Burkina Faso	35.6	34.9	30.3 - 40.3	8.6	8.1 - 9.7	36.3	30.2 - 42.4	9.7	9.2 - 10.8	5.6	6.3	13.9	14.8
28	Burundi	35.1	33.4	29.3 - 38.8	8.6	7.9 - 10.0	36.8	32.0 - 43.9	10.4	9.5 - 12.0	5.3	6.2	13.7	14.4
29	Cambodia	47.5	45.6	39.5 - 49.9	9.7	8.7 - 10.7	49.5	42.5 - 54.0	11.0	10.0 - 12.0	6.3	7.6	12.1	13.3
30	Cameroon	41.5	41.1	36.8 - 47.2	9.7	8.9 - 11.6	41.8	36.3 - 48.4	10.4	9.6 - 12.0	6.0	7.3	12.8	14.8
31	Canada	72.0	70.1	69.5 - 70.7	16.1	15.8 - 16.3	74.0	73.4 - 74.6	19.3	19.0 - 19.5	7.1	8.3	9.2	10.0
32	Cape Verde	60.8	58.8	55.1 - 62.6	11.8	10.7 - 13.1	62.9	60.5 - 65.5	13.4	12.5 - 14.3	7.9	10.0	11.8	13.7
33	Central African Republic	37.4	37.0	32.5 - 42.9	9.6	8.9 - 11.2	37.7	32.5 - 43.6	10.4	9.7 - 11.9	5.1	6.1	12.0	13.8
34	Chad	40.7	39.7	33.2 - 45.2	9.2	8.5 - 10.2	41.7	35.1 - 48.5	10.0	9.3 - 11.2	6.4	7.6	13.9	15.5
35	Chile	67.3	64.9	64.2 - 65.7	13.9	13.5 - 14.3	69.7	69.2 - 70.5	16.8	16.6 - 17.1	8.5	10.3	11.5	12.9
36	China	64.1	63.1	62.2 - 63.9	13.1	12.9 - 13.4	65.2	64.3 - 66.2	14.7	14.4 - 15.0	6.5	7.6	9.3	10.4
37	Colombia	62.0	57.8	57.7 - 59.1	12.6	12.4 - 12.8	66.3	65.6 - 67.4	15.4	15.0 - 15.8	9.7	10.0	14.4	13.1
38	Comoros	54.6	53.9	47.3 - 59.4	10.8	9.4 - 12.6	55.3	48.2 - 60.0	11.5	10.1 - 12.6	7.8	9.6	12.6	14.8
39	Congo	46.3	45.3	39.9 - 51.7	10.4	9.3 - 12.6	47.3	41.4 - 53.7	11.5	10.4 - 13.6	6.3	7.2	12.2	13.2
40	Cook Islands	61.6	60.6	58.9 - 61.2	11.5	11.0 - 12.0	62.7	61.7 - 63.8	12.6	12.1 - 12.7	8.6	11.5	12.5	15.5
41	Costa Rica	67.2	65.2	64.4 - 66.0	14.4	13.7 - 15.1	69.3	68.6 - 70.0	16.7	16.1 - 17.3	9.5	10.3	12.8	12.9
42	Côte d'Ivoire	39.5	37.6	32.6 - 44.2	9.5	8.8 - 11.1	41.3	36.2 - 47.7	10.7	9.9 - 12.4	5.4	6.7	12.6	13.9
43	Croatia	66.6	63.8	63.2 - 64.6	12.5	12.4 - 12.9	69.3	68.4 - 70.0	16.1	15.5 - 16.2	7.2	9.3	10.1	11.8
44	Cuba	68.3	67.1	66.1 - 67.9	15.2	14.8 - 15.4	69.5	68.8 - 70.3	16.7	16.4 - 16.9	7.9	9.8	10.5	12.4
45	Cyprus	67.6	66.7	65.9 - 67.5	14.2	13.8 - 14.6	68.5	67.1 - 70.0	15.0	14.1 - 16.0	8.8	10.6	11.7	13.4
46	Czech Republic	68.4	65.9	65.2 - 66.5	13.5	13.3 - 13.7	70.9	70.2 - 71.7	16.8	16.5 - 17.1	6.6	8.1	9.1	10.3
47	Democratic People's Republic of Korea	58.8	58.0	50.9 - 64.2	12.1	10.5 - 14.4	59.7	51.6 - 65.7	13.2	11.4 - 14.9	6.4	7.4	10.0	11.0
48	Democratic Republic of the Congo	37.1	35.0	29.6 - 39.5	8.6	7.9 - 9.4	39.1	32.6 - 44.4	10.2	9.5 - 11.1	6.0	7.0	14.7	15.1
49	Denmark	69.8	68.6	68.0 - 69.1	15.2	15.0 - 15.4	71.1	70.6 - 71.8	17.2	16.9 - 17.4	6.3	8.4	8.4	10.5
50	Djibouti	42.9	42.5	37.8 - 48.9	9.8	9.0 - 11.7	43.2	37.7 - 49.7	10.6	9.6 - 12.2	6.1	7.4	12.6	14.7

	Member State	Healthy life expectancy (HALE) (years)									Expectation of lost healthy years at birth (years)		Percentage of total life expectancy lost	
		Total population	Males				Females							
		At birth	At birth	Uncertainty interval	At age 60	Uncertainty interval	At birth	Uncertainty interval	At age 60	Uncertainty interval	Males	Females	Males	Females
51	Dominica	63.7	61.9	60.5 - 63.1	13.8	13.4 - 14.1	65.6	64.3 - 67.2	15.3	14.9 - 15.7	9.1	10.2	12.9	13.5
52	Dominican Republic	59.6	57.2	54.7 - 59.7	11.3	11.1 - 11.6	61.9	60.9 - 63.1	13.7	13.4 - 13.9	7.7	9.6	11.9	13.4
53	Ecuador	61.9	59.8	58.9 - 60.6	13.2	13.0 - 13.5	64.1	63.3 - 65.1	15.2	14.9 - 15.4	8.1	9.4	11.9	12.8
54	Egypt	59.0	57.8	57.0 - 58.2	9.9	9.7 - 10.1	60.2	59.6 - 60.9	11.3	11.0 - 11.4	7.4	8.8	11.4	12.8
55	El Salvador	59.7	57.2	55.9 - 58.5	12.6	12.4 - 12.9	62.3	61.5 - 63.3	14.1	13.8 - 14.3	9.3	10.4	14.0	14.3
56	Equatorial Guinea	45.5	44.7	38.7 - 50.3	9.7	8.8 - 10.9	46.3	39.7 - 52.2	10.5	9.7 - 11.7	7.2	8.5	13.9	15.5
57	Eritrea	50.0	49.3	39.0 - 53.3	10.6	8.9 - 12.0	50.8	43.7 - 56.4	11.3	9.9 - 12.7	6.5	8.6	11.7	14.5
58	Estonia	64.1	59.2	58.6 - 59.8	11.9	11.4 - 12.2	69.0	67.5 - 70.5	16.5	16.3 - 16.9	6.0	8.1	9.2	10.5
59	Ethiopia	41.2	40.7	34.6 - 46.7	9.7	8.9 - 11.0	41.7	35.6 - 48.2	10.2	9.5 - 11.6	6.1	7.7	13.0	15.6
60	Fiji	58.8	56.9	56.4 - 58.6	10.4	10.1 - 10.7	60.6	60.1 - 62.4	11.9	11.5 - 12.4	7.7	9.7	12.0	13.8
61	Finland	71.1	68.7	68.0 - 69.3	15.7	15.4 - 15.9	73.5	72.7 - 74.1	18.9	18.5 - 19.1	6.1	8.0	8.1	9.9
62	France	72.0	69.3	68.6 - 70.0	16.5	16.2 - 16.8	74.7	74.0 - 75.4	20.3	20.0 - 20.6	6.6	8.8	8.7	10.6
63	Gabon	51.4	50.2	44.5 - 56.4	10.6	9.4 - 12.7	52.6	45.9 - 58.6	11.6	10.2 - 13.5	7.1	8.8	12.4	14.3
64	Gambia	49.5	48.5	42.0 - 54.1	10.4	9.3 - 11.7	50.5	43.1 - 56.2	11.2	10.1 - 12.4	6.9	8.4	12.5	14.2
65	Georgia	64.4	62.2	61.1 - 63.3	12.6	12.3 - 13.0	66.6	64.8 - 67.7	14.6	13.3 - 15.1	6.2	8.4	9.1	11.2
66	Germany	71.8	69.6	68.9 - 70.4	15.9	15.6 - 16.2	74.0	73.4 - 74.8	19.0	18.8 - 19.3	5.9	7.6	7.8	9.3
67	Ghana	49.8	49.2	43.3 - 55.8	10.5	9.3 - 12.4	50.3	43.8 - 56.3	11.2	10.0 - 12.8	7.2	8.5	12.7	14.4
68	Greece	71.0	69.1	68.4 - 69.7	16.0	15.8 - 16.3	72.9	72.3 - 73.8	18.1	17.7 - 18.4	6.7	8.1	8.9	10.0
69	Grenada	59.2	58.4	57.0 - 59.7	11.1	10.8 - 11.5	60.0	58.8 - 61.3	12.6	12.3 - 12.9	7.5	8.9	11.4	12.9
70	Guatemala	57.4	54.9	53.6 - 56.2	12.3	11.9 - 12.7	59.9	58.6 - 61.4	13.3	13.0 - 13.6	8.2	9.1	13.0	13.2
71	Guinea	44.8	43.9	38.2 - 49.0	9.6	8.7 - 10.7	45.6	38.9 - 51.7	10.5	9.6 - 11.6	7.0	8.2	13.7	15.2
72	Guinea-Bissau	40.5	39.6	33.1 - 44.1	9.2	8.5 - 10.0	41.5	34.3 - 48.0	10.1	9.4 - 11.0	6.1	7.2	13.4	14.7
73	Guyana	55.2	53.1	50.6 - 55.9	10.2	9.9 - 10.6	57.2	54.6 - 59.9	12.2	11.8 - 12.7	8.4	9.7	13.6	14.5
74	Haiti	43.8	43.5	38.1 - 48.7	10.3	9.2 - 11.9	44.1	37.9 - 49.1	11.7	10.5 - 12.9	5.6	6.9	11.4	13.6
75	Honduras	58.4	56.3	53.1 - 59.2	11.4	10.4 - 12.6	60.5	58.1 - 62.9	13.1	12.3 - 14.0	7.9	9.9	12.4	14.0
76	Hungary	64.9	61.5	60.9 - 62.2	12.2	12.0 - 12.3	68.2	67.6 - 69.0	15.9	15.7 - 16.2	6.9	8.6	10.0	11.2
77	Iceland	72.8	72.1	71.2 - 72.9	17.5	17.1 - 17.9	73.6	72.7 - 74.2	18.7	18.2 - 18.9	6.3	8.2	8.1	10.0
78	India	53.5	53.3	52.5 - 54.1	10.8	10.6 - 11.0	53.6	52.7 - 54.6	11.4	11.0 - 11.8	6.8	8.4	11.3	13.6
79	Indonesia	58.1	57.4	56.6 - 58.4	10.7	10.5 - 11.0	58.9	58.1 - 59.9	11.5	11.3 - 11.8	7.5	9.1	11.5	13.4
80	Iran, Islamic Republic of	57.6	56.1	54.9 - 57.3	10.4	10.2 - 10.7	59.1	58.2 - 60.5	11.9	11.6 - 12.2	10.4	12.5	15.7	17.5
81	Iraq	50.1	48.8	47.0 - 50.4	9.2	8.9 - 9.5	51.5	50.1 - 53.4	10.6	10.3 - 10.9	10.3	11.6	17.5	18.4
82	Ireland	69.8	68.1	67.3 - 68.9	14.8	14.4 - 15.2	71.5	70.8 - 72.3	17.5	17.2 - 17.8	6.3	8.2	8.5	10.3
83	Israel	71.4	70.5	69.4 - 71.2	16.8	16.4 - 17.2	72.3	71.6 - 73.1	18.2	17.6 - 18.8	6.9	9.0	8.9	11.1
84	Italy	72.7	70.7	70.0 - 71.5	16.4	16.0 - 16.7	74.7	74.0 - 75.5	19.4	19.1 - 19.8	6.0	7.8	7.8	9.5
85	Jamaica	65.1	64.2	62.8 - 65.6	13.0	12.6 - 13.5	65.9	64.9 - 67.2	14.5	14.1 - 14.9	6.9	8.6	9.7	11.5
86	Japan	75.0	72.3	71.5 - 73.1	17.5	17.2 - 17.8	77.7	76.9 - 78.1	21.7	21.4 - 22.0	6.1	7.5	7.8	8.8
87	Jordan	61.0	59.7	58.2 - 60.3	11.1	10.8 - 11.4	62.3	61.4 - 63.0	12.9	12.5 - 13.1	9.0	10.9	13.1	14.9
88	Kazakhstan	55.9	52.6	51.6 - 53.7	9.7	8.1 - 12.0	59.3	58.0 - 60.0	12.5	12.2 - 12.8	6.1	9.6	10.4	13.9
89	Kenya	44.4	44.1	39.8 - 51.2	10.7	9.5 - 13.2	44.8	39.9 - 51.6	11.5	10.3 - 13.5	5.7	7.1	11.5	13.7
90	Kiribati	54.0	52.3	51.1 - 53.4	11.5	11.2 - 11.9	55.6	54.7 - 57.0	11.6	11.3 - 11.9	9.5	11.0	15.4	16.5
91	Kuwait	67.0	67.4	66.3 - 68.7	14.2	13.3 - 15.1	66.6	65.0 - 68.4	13.6	12.3 - 14.8	8.4	10.2	11.1	13.3
92	Kyrgyzstan	55.3	52.2	51.2 - 53.3	9.8	9.4 - 10.2	58.4	56.9 - 59.1	12.6	12.3 - 12.9	8.2	10.6	13.5	15.3
93	Lao People's Democratic Republic	47.0	47.1	44.8 - 49.6	9.6	9.4 - 9.9	47.0	44.7 - 49.5	10.1	9.8 - 10.4	7.0	9.2	12.9	16.4
94	Latvia	62.8	58.0	57.2 - 59.2	11.3	10.9 - 11.7	67.5	66.7 - 68.5	15.7	15.5 - 16.1	6.6	8.3	10.2	10.9
95	Lebanon	60.4	59.2	57.9 - 60.4	11.3	10.9 - 11.6	61.6	60.7 - 62.9	12.6	12.3 - 13.0	8.4	10.4	12.5	14.5
96	Lesotho	31.4	29.6	27.1 - 35.2	9.9	9.3 - 12.9	33.2	29.9 - 40.0	11.0	10.1 - 13.4	3.3	5.0	10.1	13.1
97	Liberia	35.3	33.6	27.4 - 38.7	7.9	7.3 - 8.6	37.0	29.8 - 43.2	9.7	9.2 - 10.7	6.5	6.7	16.1	15.4
98	Libyan Arab Jamahiriya	63.7	62.3	59.1 - 65.2	12.0	10.9 - 13.3	65.0	63.2 - 67.2	13.8	13.0 - 14.7	8.1	10.5	11.5	13.9
99	Lithuania	63.3	58.9	58.1 - 60.1	12.0	11.8 - 12.3	67.7	67.0 - 68.6	16.2	15.9 - 16.5	7.2	9.9	10.9	12.8
100	Luxembourg	71.5	69.3	68.6 - 69.9	16.0	15.7 - 16.3	73.7	73.1 - 74.7	19.2	18.9 - 19.6	6.4	8.0	8.4	9.8

Annex Table 4 Healthy life expectancy (HALE) in all Member States, estimates for 2002

Figures computed by WHO to assure comparability;[a] they are not necessarily the official statistics of Member States, which may use alternative rigorous methods.

		Healthy life expectancy (HALE) (years)									Expectation of lost healthy years at birth (years)		Percentage of total life expectancy lost	
		Total population	Males				Females							
	Member State	At birth	At birth	Uncertainty interval	At age 60	Uncertainty interval	At birth	Uncertainty interval	At age 60	Uncertainty interval	Males	Females	Males	Females
101	Madagascar	48.6	47.3	40.8 - 52.3	10.1	9.1 - 11.1	49.9	42.5 - 54.8	11.1	10.0 - 12.0	7.2	8.4	13.1	14.4
102	Malawi	34.9	35.0	31.6 - 40.5	9.7	9.0 - 11.4	34.8	30.8 - 40.7	10.4	9.7 - 11.9	4.8	5.8	12.1	14.3
103	Malaysia	63.2	61.6	60.8 - 62.5	10.9	10.7 - 11.1	64.8	64.1 - 65.6	12.0	11.8 - 12.3	8.0	10.0	11.4	13.3
104	Maldives	57.8	59.0	58.1 - 60.5	10.5	10.3 - 10.7	56.6	55.7 - 57.7	9.4	9.2 - 9.6	7.5	9.0	11.3	13.8
105	Mali	37.9	37.5	31.0 - 42.0	8.8	8.2 - 9.4	38.3	31.4 - 44.7	9.5	8.9 - 10.3	6.4	7.4	14.6	16.1
106	Malta	71.0	69.7	68.9 - 70.5	15.3	14.8 - 15.7	72.3	71.4 - 73.4	17.6	17.0 - 18.3	6.2	8.0	8.1	10.0
107	Marshall Islands	54.8	53.9	52.3 - 55.7	9.8	9.6 - 10.1	55.7	54.4 - 57.3	10.7	10.4 - 10.9	7.2	8.9	11.7	13.8
108	Mauritania	44.5	42.8	36.0 - 47.5	9.5	8.6 - 10.2	46.3	38.4 - 51.4	10.5	9.7 - 11.4	6.9	8.2	14.0	15.1
109	Mauritius	62.4	60.3	59.2 - 61.3	11.7	11.4 - 12.0	64.6	63.8 - 65.6	13.8	13.6 - 14.1	8.1	10.9	11.9	14.5
110	Mexico	65.5	63.4	62.6 - 64.1	14.5	14.2 - 14.8	67.6	67.0 - 68.4	16.3	16.0 - 16.5	8.4	9.3	11.6	12.1
111	Micronesia, Federated States of	57.7	57.0	55.2 - 59.0	10.9	10.6 - 11.3	58.4	56.6 - 60.4	11.5	11.2 - 11.9	7.9	9.6	12.2	14.2
112	Monaco	72.9	70.7	70.0 - 71.4	17.3	17.1 - 17.6	75.2	74.4 - 76.0	20.5	20.1 - 20.9	7.1	9.3	9.1	11.0
113	Mongolia	55.6	53.3	52.4 - 54.4	10.2	10.0 - 10.4	58.0	57.1 - 58.9	12.4	12.2 - 12.6	6.8	8.0	11.3	12.1
114	Morocco	60.2	59.5	58.2 - 60.7	11.4	11.0 - 11.8	60.9	59.9 - 62.2	12.7	12.3 - 13.1	9.4	11.9	13.6	16.4
115	Mozambique	36.9	36.3	29.5 - 39.2	9.8	9.0 - 11.1	37.5	30.1 - 41.3	10.4	9.7 - 11.7	4.9	6.4	11.9	14.5
116	Myanmar	51.7	49.9	43.2 - 55.9	10.1	9.1 - 11.6	53.5	45.5 - 58.8	11.3	10.0 - 12.5	6.3	8.4	11.2	13.5
117	Namibia	43.3	42.9	39.8 - 49.1	11.2	9.9 - 14.8	43.8	39.2 - 49.7	12.1	10.6 - 14.8	5.2	6.7	10.8	13.3
118	Nauru	55.1	52.7	49.6 - 56.2	8.7	8.1 - 9.6	57.5	55.0 - 60.5	10.5	10.0 - 11.4	6.9	9.0	11.6	13.5
119	Nepal	51.8	52.5	51.3 - 53.6	10.5	10.3 - 10.8	51.1	50.2 - 52.3	10.8	10.5 - 11.0	7.4	9.1	12.4	15.1
120	Netherlands	71.2	69.7	69.1 - 70.4	15.5	15.2 - 15.8	72.6	72.0 - 73.4	18.4	18.1 - 18.7	6.3	8.5	8.3	10.4
121	New Zealand	70.8	69.5	68.8 - 70.2	16.0	15.7 - 16.3	72.2	71.5 - 73.0	18.2	17.8 - 18.5	7.2	9.0	9.3	11.1
122	Nicaragua	61.4	59.7	58.4 - 60.3	13.0	12.8 - 13.3	63.1	61.9 - 64.0	14.5	14.3 - 14.9	8.2	9.3	12.0	12.9
123	Niger	35.5	35.8	26.8 - 41.3	8.5	7.9 - 9.2	35.2	26.2 - 42.5	9.3	8.9 - 10.0	6.8	7.5	15.9	17.5
124	Nigeria	41.5	41.3	35.2 - 45.6	9.3	8.5 - 10.4	41.8	34.9 - 47.7	10.0	9.3 - 11.2	6.8	7.8	14.1	15.6
125	Niue	60.4	58.9	55.7 - 61.4	11.6	10.5 - 12.7	62.0	59.9 - 64.3	12.8	12.0 - 13.6	8.6	11.3	12.8	15.5
126	Norway	72.0	70.4	69.5 - 71.3	16.2	15.7 - 16.6	73.6	72.8 - 74.4	18.9	18.5 - 19.1	5.9	8.1	7.8	9.9
127	Oman	64.0	62.7	59.9 - 65.3	11.9	10.7 - 13.1	65.3	63.4 - 67.1	13.7	12.9 - 14.6	8.3	11.1	11.8	14.5
128	Pakistan	53.3	54.2	52.5 - 56.0	11.4	11.0 - 11.7	52.3	50.7 - 54.4	11.4	11.1 - 11.7	6.9	9.3	11.3	15.0
129	Palau	59.6	58.7	57.9 - 59.7	10.2	10.0 - 10.4	60.5	59.6 - 61.7	12.0	11.8 - 12.4	7.7	10.4	11.5	14.7
130	Panama	66.2	64.3	63.2 - 65.4	14.9	14.5 - 15.4	68.0	67.2 - 69.2	16.8	16.4 - 17.2	8.5	10.2	11.7	13.0
131	Papua New Guinea	51.9	51.4	49.7 - 53.6	10.1	9.8 - 10.3	52.4	50.9 - 54.4	10.6	10.3 - 10.9	7.0	9.1	12.0	14.8
132	Paraguay	61.9	59.6	58.5 - 60.6	11.7	11.2 - 12.0	64.2	63.3 - 65.1	14.6	14.1 - 14.7	9.1	10.5	13.2	14.0
133	Peru	61.0	59.6	58.4 - 60.7	12.7	12.4 - 13.1	62.4	61.4 - 63.6	14.4	14.1 - 14.7	7.9	9.6	11.7	13.3
134	Philippines	59.3	57.1	56.2 - 58.1	10.6	10.4 - 10.8	61.5	60.6 - 62.6	12.1	11.9 - 12.4	8.0	10.2	12.4	14.3
135	Poland	65.8	63.1	62.4 - 63.8	12.8	12.6 - 13.0	68.5	67.9 - 69.2	16.1	15.8 - 16.3	7.5	10.2	10.6	13.0
136	Portugal	69.2	66.7	66.0 - 67.4	14.9	14.7 - 15.2	71.7	71.1 - 72.5	17.7	17.4 - 17.9	6.9	8.8	9.4	10.9
137	Qatar	65.2	66.7	65.6 - 67.6	13.7	13.1 - 14.4	63.8	62.4 - 65.4	11.2	10.2 - 12.3	8.2	10.0	10.9	13.6
138	Republic of Korea	67.8	64.8	64.1 - 65.6	13.2	13.0 - 13.5	70.8	70.1 - 71.6	17.1	16.8 - 17.3	6.9	8.6	9.7	10.8
139	Republic of Moldova	59.8	57.2	56.2 - 58.2	11.0	10.8 - 11.1	62.4	61.2 - 62.9	13.2	12.9 - 13.4	6.8	9.2	10.6	12.9
140	Romania	63.1	61.0	59.9 - 62.1	12.3	12.1 - 12.6	65.2	64.3 - 66.3	14.6	14.2 - 15.0	7.0	9.7	10.3	13.0
141	Russian Federation	58.6	52.8	51.9 - 54.0	10.1	7.0 - 13.2	64.3	63.6 - 65.4	14.2	13.9 - 14.4	5.6	7.8	9.6	10.8
142	Rwanda	38.3	36.4	33.0 - 42.5	9.0	8.3 - 10.4	40.2	35.6 - 47.4	10.5	9.7 - 11.8	5.6	6.6	13.3	14.1
143	Saint Kitts and Nevis	61.5	59.9	59.0 - 61.0	11.9	11.6 - 12.2	63.1	61.9 - 64.3	13.5	13.2 - 13.8	8.7	9.1	12.7	12.7
144	Saint Lucia	62.7	61.2	60.0 - 62.5	12.5	12.2 - 12.8	64.2	63.0 - 65.7	14.4	14.1 - 14.8	8.6	10.2	12.3	13.7
145	Saint Vincent and the Grenadines	61.0	59.9	58.6 - 61.3	12.6	12.4 - 12.9	62.2	61.0 - 63.6	14.2	13.6 - 14.8	7.9	9.8	11.7	13.6
146	Samoa	59.7	59.2	58.1 - 60.3	10.9	10.7 - 11.2	60.3	59.3 - 61.6	11.6	11.3 - 11.9	7.6	9.4	11.3	13.5
147	San Marino	73.4	70.9	69.4 - 72.3	16.2	15.3 - 17.1	75.9	75.0 - 78.0	19.9	19.5 - 21.6	6.3	8.1	8.2	9.6
148	Sao Tome and Principe	54.4	54.2	47.7 - 59.7	11.0	9.6 - 12.7	54.7	46.7 - 59.5	11.4	10.1 - 12.6	7.5	9.0	12.2	14.1
149	Saudi Arabia	61.4	59.8	56.5 - 63.1	11.2	10.2 - 12.5	62.9	60.7 - 65.2	13.0	12.2 - 13.9	8.6	11.0	12.6	14.9
150	Senegal	48.0	47.1	41.0 - 52.1	9.9	8.9 - 11.1	48.9	41.9 - 54.4	10.7	9.8 - 11.9	7.3	8.4	13.4	14.7

	Member State	Healthy life expectancy (HALE) (years)									Expectation of lost healthy years at birth (years)		Percentage of total life expectancy lost	
		Total population	Males				Females							
		At birth	At birth	Uncertainty interval	At age 60	Uncertainty interval	At birth	Uncertainty interval	At age 60	Uncertainty interval	Males	Females	Males	Females
151	Serbia and Montenegro	63.8	62.7	62.0 - 63.5	12.1	11.8 - 12.4	64.9	63.7 - 65.3	13.9	13.7 - 14.2	7.0	10.0	10.1	13.3
152	Seychelles	61.2	57.4	56.4 - 58.4	9.9	9.6 - 10.1	64.9	63.8 - 66.2	14.0	13.6 - 14.5	9.6	12.3	14.3	15.9
153	Sierra Leone	28.6	27.2	19.4 - 32.6	7.8	7.4 - 8.3	29.9	21.7 - 37.7	9.2	8.9 - 10.0	5.1	5.8	15.9	16.2
154	Singapore	70.1	68.8	67.7 - 70.0	14.5	14.0 - 15.1	71.3	70.6 - 72.1	16.3	15.9 - 16.5	8.6	10.4	11.1	12.7
155	Slovakia	66.2	63.0	62.3 - 63.8	12.3	12.1 - 12.5	69.4	68.7 - 70.2	16.1	15.9 - 16.4	6.7	8.9	9.6	11.4
156	Slovenia	69.5	66.6	65.8 - 67.4	14.3	14.0 - 14.5	72.3	71.6 - 73.1	18.1	17.8 - 18.3	6.1	8.2	8.4	10.2
157	Solomon Islands	56.2	55.4	53.4 - 57.6	10.9	10.5 - 11.4	57.1	55.7 - 58.8	11.6	11.2 - 11.9	8.3	10.3	13.0	15.3
158	Somalia	36.8	36.1	30.5 - 40.4	8.3	7.6 - 9.0	37.5	29.6 - 43.3	9.4	8.9 - 10.2	6.9	8.1	16.1	17.7
159	South Africa	44.3	43.3	39.8 - 46.8	10.6	10.0 - 12.0	45.3	39.8 - 50.8	12.1	11.5 - 13.1	5.5	7.3	11.3	13.8
160	Spain	72.6	69.9	69.1 - 70.7	16.4	16.1 - 16.8	75.3	74.6 - 76.1	19.9	19.6 - 20.2	6.2	7.7	8.2	9.3
161	Sri Lanka	61.6	59.2	57.3 - 61.0	10.5	9.9 - 11.1	64.0	63.0 - 65.1	12.7	12.3 - 13.0	8.0	10.3	11.8	13.9
162	Sudan	48.5	47.2	41.8 - 52.7	9.8	8.7 - 11.5	49.9	43.0 - 54.6	10.7	9.5 - 11.8	7.8	9.4	14.1	15.9
163	Suriname	58.8	56.7	55.3 - 58.3	10.6	10.2 - 11.0	60.8	59.7 - 62.4	12.8	12.3 - 13.2	7.6	10.0	11.8	14.1
164	Swaziland	34.2	33.2	30.9 - 36.5	10.2	9.1 - 12.1	35.2	31.5 - 38.9	10.9	9.7 - 12.5	3.7	5.2	10.1	12.9
165	Sweden	73.3	71.9	71.2 - 72.5	17.1	16.8 - 17.4	74.8	74.0 - 75.5	19.6	19.3 - 19.9	6.2	7.9	7.9	9.5
166	Switzerland	73.2	71.1	70.3 - 71.8	17.1	16.7 - 17.5	75.3	74.5 - 76.0	20.4	20.1 - 20.7	6.6	8.1	8.5	9.7
167	Syrian Arab Republic	61.7	60.4	59.3 - 61.5	11.3	11.0 - 11.6	63.1	62.3 - 64.1	12.9	12.6 - 13.2	8.5	10.5	12.3	14.2
168	Tajikistan	54.7	53.1	51.7 - 55.0	9.5	9.3 - 9.7	56.4	54.5 - 57.6	11.0	10.7 - 11.2	7.9	10.1	13.0	15.2
169	Thailand	60.1	57.7	56.5 - 58.9	12.7	12.4 - 13.0	62.4	61.5 - 63.5	13.2	13.0 - 13.5	8.4	10.2	12.7	14.1
170	The former Yugoslav Republic of Macedonia	63.4	61.9	61.0 - 62.8	12.2	11.9 - 12.7	65.0	63.7 - 65.6	14.0	13.6 - 14.5	7.2	10.2	10.4	13.5
171	Timor-Leste	49.8	47.9	40.8 - 53.6	10.0	9.0 - 11.2	51.8	43.5 - 56.9	11.1	10.0 - 12.2	6.9	8.7	12.7	14.4
172	Togo	44.6	43.5	38.0 - 48.1	9.8	8.8 - 11.0	45.7	39.6 - 50.6	10.7	9.7 - 11.9	6.5	7.7	12.9	14.3
173	Tonga	61.8	61.9	61.0 - 62.7	11.9	11.7 - 12.1	61.8	61.0 - 62.7	12.0	11.8 - 12.2	8.2	9.6	11.7	13.5
174	Trinidad and Tobago	62.0	59.8	58.8 - 60.8	11.9	11.6 - 12.1	64.2	63.4 - 65.1	14.1	13.9 - 14.4	7.3	8.6	10.8	11.9
175	Tunisia	62.5	61.3	60.4 - 62.4	12.0	11.7 - 12.3	63.6	62.7 - 64.8	13.3	13.0 - 13.7	8.2	10.3	11.8	13.9
176	Turkey	62.0	61.2	60.3 - 62.2	12.8	12.5 - 13.0	62.8	61.7 - 64.0	14.2	13.8 - 14.6	6.7	9.3	9.8	12.9
177	Turkmenistan	54.4	51.6	50.8 - 52.5	9.2	8.9 - 9.5	57.2	55.9 - 57.8	11.5	11.4 - 11.8	7.1	9.7	12.2	14.5
178	Tuvalu	53.0	53.0	51.3 - 54.7	9.7	9.5 - 9.8	53.1	51.1 - 54.9	10.3	9.4 - 11.8	7.0	8.3	11.7	13.6
179	Uganda	42.7	41.7	37.1 - 46.1	9.8	8.9 - 11.1	43.7	37.5 - 48.0	10.9	9.8 - 11.9	6.2	7.2	12.9	14.1
180	Ukraine	59.2	54.9	54.1 - 55.9	10.3	9.7 - 11.1	63.6	62.8 - 64.7	13.7	13.4 - 14.0	6.8	9.4	11.0	12.8
181	United Arab Emirates	63.9	63.5	62.6 - 64.0	12.0	11.8 - 12.2	64.2	63.6 - 65.0	12.5	12.3 - 12.7	7.8	10.9	10.9	14.5
182	United Kingdom	70.6	69.1	68.5 - 69.9	15.7	15.4 - 16.1	72.1	71.3 - 73.0	18.1	17.7 - 18.4	6.7	8.4	8.8	10.4
183	United Republic of Tanzania	40.4	40.0	38.7 - 41.5	9.6	9.4 - 9.8	40.7	39.6 - 42.3	10.1	9.9 - 10.3	5.5	6.8	12.1	14.3
184	United States of America	69.3	67.2	66.6 - 67.8	15.3	15.0 - 15.5	71.3	70.8 - 72.0	17.9	17.7 - 18.1	7.4	8.5	9.9	10.7
185	Uruguay	66.2	63.0	62.1 - 63.9	13.0	12.8 - 13.3	69.4	68.6 - 70.2	17.1	16.8 - 17.4	8.0	9.9	11.3	12.5
186	Uzbekistan	59.4	57.9	56.9 - 58.9	10.8	10.6 - 11.1	60.9	59.4 - 61.4	12.6	12.3 - 12.9	7.6	10.0	11.6	14.1
187	Vanuatu	58.9	58.5	56.9 - 60.3	11.1	10.7 - 11.5	59.4	57.9 - 61.2	11.7	11.3 - 12.1	8.0	9.8	12.0	14.1
188	Venezuela, Bolivarian Republic of	64.2	61.7	60.8 - 62.6	13.9	13.6 - 14.2	66.7	66.0 - 67.6	15.7	15.4 - 15.9	9.3	10.1	13.1	13.1
189	Viet Nam	61.3	59.8	58.7 - 60.9	11.4	11.2 - 11.7	62.9	62.0 - 64.2	13.1	12.8 - 13.4	7.4	9.3	11.0	12.9
190	Yemen	49.3	48.0	42.3 - 52.6	8.7	7.7 - 9.9	50.7	44.2 - 55.2	10.4	9.2 - 11.4	10.8	11.5	18.4	18.5
191	Zambia	34.9	34.8	30.8 - 38.7	9.8	8.9 - 11.0	35.0	30.8 - 39.4	10.4	9.6 - 11.6	4.3	5.3	11.0	13.1
192	Zimbabwe	33.6	33.8	31.9 - 36.0	9.7	9.4 - 9.9	33.3	31.5 - 36.0	10.6	10.4 - 10.9	3.9	4.7	10.4	12.3

[a] See explanatory notes for sources and methods.

Annex Table 5 Selected national health accounts indicators: measured levels of expenditure on health, 1997–2001

Figures computed by WHO to assure comparability;[a] they are not necessarily the official statistics of Member States, which may use alternative rigorous methods.

	Member State	Total expenditure on health as % of GDP					General government expenditure on health as % of total expenditure on health					Private expenditure on health as % of total expenditure on health					General government expenditure on health as % of total government expenditure				
		1997	1998	1999	2000	2001	1997	1998	1999	2000	2001	1997	1998	1999	2000	2001	1997	1998	1999	2000	2001
1	Afghanistan	5.6	5.5	5.5	5	5.2	50	52.8	53.1	53.8	52.6	50	47.2	46.9	46.2	47.4	14	14.6	14.8	13.5	11.8
2	Albania	3.8	3.4	3.6	3.8	3.7	61.2	61.9	62.3	63.9	64.6	38.8	38.1	37.7	36.1	35.4	7.8	6.9	6.9	7.7	7.3
3	Algeria	3.4	3.6	3.6	3.8	4.1	71.7	70.5	69.6	70.6	75	28.3	29.5	30.4	29.4	25	7.9	8.2	8.5	9.3	9.9
4	Andorra	5.7	7.8	5.9	5.5	5.7	71.5	78.6	71.6	70.1	71	28.5	21.4	28.4	29.9	29	32.5	39.2	31.8	32	26.3
5	Angola	3.9	3.5	3.3	3.5	4.4	45.2	39.8	44.3	55.8	63.1	54.8	60.2	55.7	44.2	36.9	4.6	2.5	2.4	3.3	5.5
6	Antigua and Barbuda	5.4	5.3	5.3	5.5	5.6	61.9	62.5	61.3	59.9	60.9	38.1	37.5	38.7	40.1	39.1	14.2	14.5	13.9	14.1	13
7	Argentina	8.1	8.2	9	8.9	9.5	55.5	55.2	56.2	55.2	53.4	44.5	44.8	43.8	44.8	46.6	22.9	22.6	23.3	22	21.3
8	Armenia	7.1	7.1	7.9	8	7.8	35.2	36.8	41	40.2	41.2	64.8	63.2	59	59.8	58.8	9.4	10.8	10.5	10.6	11.5
9	Australia	8.5	8.6	8.7	8.9	9.2	67.8	68.2	69.1	68.9	67.9	32.2	31.8	30.9	31.1	32.1	15.8	16.2	16.8	16.5	16.8
10	Austria	8	8	8	8	8	70.9	71.4	70	69.7	69.3	29.1	28.6	30	30.3	30.7	10.4	10.5	10.4	10.6	10.7
11	Azerbaijan	2.2	2.3	2	1.7	1.6	73.4	73.1	70.3	67.9	66.9	26.6	26.9	29.7	32.1	33.1	8.8	11	8	7.3	7.2
12	Bahamas	5.4	5.6	5.4	5.7	5.7	55.6	57.6	57.4	56.8	57	44.4	42.4	42.6	43.2	43	13.7	15.3	15	15.9	15.1
13	Bahrain	4.8	5	4.8	4.1	4.1	70.5	69.7	69.3	69.1	69	29.5	30.3	30.7	30.9	31	11.9	11.5	11.4	10.8	10.8
14	Bangladesh	2.9	2.9	3.1	3.6	3.5	33.7	36	36.9	45.3	44.2	66.3	64	63.1	54.7	55.8	5.6	5.9	6.3	8.6	8.7
15	Barbados	5.9	5.9	6.1	6.2	6.5	65.2	65.6	65.7	65.9	66.3	34.8	34.4	34.3	34.1	33.7	11.7	11.8	12	12	11.5
16	Belarus	6.1	5.7	5.8	5.4	5.6	87.2	86.1	85.5	85.4	86.7	12.8	13.9	14.5	14.6	13.3	11.6	11.9	11.7	13.1	14.2
17	Belgium	8.4	8.4	8.5	8.6	8.9	71.5	72	72.2	72.1	71.7	28.5	28	27.8	27.9	28.3	11.7	11.9	12.3	12.6	13
18	Belize	4.7	4.9	5.1	5	5.2	51	51.7	48.6	48	45.1	49	48.3	51.4	52	54.9	5.6	5.6	5.5	5.3	5
19	Benin	3.7	3.8	3.9	4.2	4.4	34	36.5	38.6	43.3	46.9	66	63.5	61.4	56.7	53.1	6.7	8.5	8.7	8.9	10.9
20	Bhutan	3.6	3.8	3.5	3.9	3.9	90.4	90.3	89.6	90.6	90.6	9.6	9.7	10.4	9.4	9.4	10.1	9.6	8.3	9.2	7.5
21	Bolivia	4.7	5	5.2	5.2	5.3	63.9	65.6	66.1	67	66.3	36.1	34.4	33.9	33	33.7	9.1	10	10.4	10.3	10.3
22	Bosnia and Herzegovina	6.7	7.9	7.7	7.7	7.5	52.4	40.2	39.4	39.7	36.8	47.6	59.8	60.6	60.3	63.2	12.6	11.7	9.4	9.1	9.6
23	Botswana	5.7	5.5	6	6	6.6	58.8	59.7	60.6	62	66.2	41.2	40.3	39.4	38	33.8	7.8	7.2	7.4	8.4	7.6
24	Brazil	7.4	7.4	7.8	7.6	7.6	43.5	44	42.8	40.8	41.6	56.5	56	57.2	59.2	58.4	9.1	9	9.3	8.4	8.8
25	Brunei Darussalam	2.8	3	3.2	3.1	3.1	79.4	81.3	79.4	80	79.4	20.6	18.7	20.6	20	20.6	4.5	5.1	5.1	5.2	5.1
26	Bulgaria	4.7	3.9	5	4.8	4.8	82.8	79.4	83.7	82.5	82.1	17.2	20.6	16.3	17.5	17.9	10	8.1	10.5	9.3	9.3
27	Burkina Faso	3.5	3.5	3.8	3.5	3	67.1	65.3	66.6	63.5	60.1	32.9	34.7	33.4	36.5	39.9	9.6	9.6	8.8	8.1	8.1
28	Burundi	3.1	3.2	3.2	3.5	3.6	50.3	53.8	55.3	55.6	59	49.7	46.2	44.7	44.4	41	7.5	7.7	8.4	7.1	8.1
29	Cambodia	10.9	10.8	10.8	11.8	11.8	10.2	10.1	10.1	14.2	14.9	89.8	89.9	89.9	85.8	85.1	12.5	11.8	11.3	15.7	16
30	Cameroon	3.7	3.4	3.1	3.1	3.3	21.2	19.2	22.8	33.7	37.1	78.8	80.8	77.2	66.3	62.9	5.2	4.1	4.4	7.9	7.8
31	Canada	8.9	9.1	9.1	9.1	9.5	70	70.7	70.4	70.9	70.8	30	29.3	29.6	29.1	29.2	13.9	14.4	15	15.5	16.2
32	Cape Verde	3.1	3.5	3	3.1	3.7	68.5	73	69.8	70	74.2	31.5	27	30.2	30	25.8	5	7.1	5.6	6.1	8.8
33	Central African Republic	3.6	4	4.1	4.3	4.5	37.9	44.4	48	49.2	51.2	62.1	55.6	52	50.8	48.8	8.4	9	10.1	13.9	18.5
34	Chad	2.8	2.3	2.7	3.1	2.6	78.1	72.7	75	78.7	76	21.9	27.3	25	21.3	24	12.5	10.8	11.2	12.2	15.2
35	Chile	6.6	6.9	6.8	6.8	7	37.8	39.6	40.8	42.6	44	62.2	60.4	59.2	57.4	56	12.1	12.4	11.8	11.9	12.7
36	China	4.6	4.8	5.1	5.3	5.5	40	39	38	36.6	37.2	60	61	62	63.4	62.8	14.2	13.3	11.8	10.8	10.2
37	Colombia	7.7	5.8	6.4	5.5	5.5	47.7	60.2	62	67.3	65.7	52.3	39.8	38	32.7	34.3	14.5	13	12.9	12.7	10.8
38	Comoros	3.1	3	3.1	3.1	3.1	60.3	58.6	59.6	59.7	60	39.7	41.4	40.4	40.3	40	5.9	5.1	5.8	5.7	5.8
39	Congo	3	3.1	2.6	2	2.1	70.3	76.9	70.6	73.3	63.8	29.7	23.1	29.4	26.7	36.2	5.7	5.6	5.7	5.6	5.7
40	Cook Islands	5.1	5.1	4.8	4.6	4.7	72.7	71.9	65.1	64.4	67.6	27.3	28.1	34.9	35.6	32.4	9.5	9.2	9.1	8.6	8.9
41	Costa Rica	6.7	6.7	6.5	6.9	7.2	70.7	67.6	68.5	68.5	68.5	29.3	32.4	31.5	31.5	31.5	20.8	20.5	20.1	20.4	19.5
42	Côte d'Ivoire	6.2	6.4	6.3	6.2	6.2	19	19.2	20	15.4	16	81	80.8	80	84.6	84	5.4	5.9	6.4	5.3	6
43	Croatia	8.1	8.8	8.9	9.4	9	80.5	81.8	82.6	83.2	81.8	19.5	18.2	17.4	16.8	18.2	13.2	13.7	13.4	14.4	12.8
44	Cuba	6.6	6.6	7.1	7.1	7.2	83.7	84.7	85.5	85.8	86.2	16.3	15.3	14.5	14.2	13.8	10	10.3	11.1	10.8	11.4
45	Cyprus	8.3	8.1	7.6	8	8.1	50.3	52	50.6	48.7	47.7	49.7	48	49.4	51.3	52.3	11.4	11.4	10.9	10.7	10.2
46	Czech Republic	7.1	7.1	7.1	7.1	7.4	91.7	91.9	91.5	91.4	91.4	8.3	8.1	8.5	8.6	8.6	14	13.6	13.9	13.9	14.1
47	Democratic People's Republic of Korea	2.2	2.8	2.6	2.4	2.5	71.4	76.9	75.3	73.5	73.4	28.6	23.1	24.7	26.5	26.6	3.5	3.3	3.2	2.9	3
48	Democratic Republic of Congo	3.3	3	3.1	3.2	3.5	47.1	41.7	41.5	44.7	44.4	52.9	58.3	58.5	55.3	55.6	10.3	8.3	8.7	9.7	10.3
49	Denmark	8.2	8.4	8.5	8.2	8.4	82.3	82	82.2	82.5	82.4	17.7	18	17.8	17.5	17.6	11.7	11.9	12.4	12.6	12.8
50	Djibouti	7.3	7.2	7.1	7.1	7	58.1	58	58.4	58.4	58.8	41.9	42	41.6	41.6	41.2	11.8	12.5	12.4	12.5	13.7
51	Dominica	5.9	5.7	6.2	5.8	6	75	74.7	74.3	71.5	71.3	25	25.3	25.7	28.5	28.7	11.8	11.8	12.8	12.8	10.5
52	Dominican Republic	5.8	5.8	5.7	6.2	6.1	32	31.4	32.2	35.4	36.1	68	68.6	67.8	64.6	63.9	12.2	11.8	11.3	14.6	13.5
53	Ecuador	4.4	4.4	3.7	4.1	4.5	53.3	50.3	55.6	55.2	50.3	46.7	49.7	44.4	44.8	49.7	10.4	10.7	9	9.3	9.6
54	Egypt	3.9	3.9	3.9	3.8	3.9	45.9	46	46.4	46.1	48.9	54.1	54	53.6	53.9	51.1	5.9	6.5	6.2	6.5	7.4
55	El Salvador	8.1	8.2	8	8	8	38.7	42.5	43.5	45.1	46.7	61.3	57.5	56.5	54.9	53.3	22.6	24.2	25.1	25	24

	Member State	External resources for health as % of total expenditure on health					Social security expenditure on health as % of general govenment expenditure on health					Out-of-pocket expenditure as % of private expenditure on health					Private prepaid plans as % of private expenditure on health				
		1997	1998	1999	2000	2001	1997	1998	1999	2000	2001	1997	1998	1999	2000	2001	1997	1998	1999	2000	2001
1	Afghanistan	9.1	3.7	4.4	14.8	11.2	0	0	0	0	0	100	100	100	100	100	0	0	0	0	0
2	Albania	9.4	7.4	5.1	7	3.4	20.6	24.2	22.5	18.5	19.3	65.1	61.2	63.3	65	65.3	34.1	38	36	34.3	33.9
3	Algeria	0.2	0	0.1	0.1	0.1	46.9	45.2	43.5	39.9	37.4	91.9	91.6	92	91.1	89.9	4.1	4.2	4	4.2	5.1
4	Andorra	0	0	0	0	0	78.6	60	87.5	88.1	86.2	95.5	95.2	95.6	96.1	92.6	n/a	n/a	n/a	n/a	n/a
5	Angola	9.4	5.6	8.7	14.3	14.2	0	0	0	0	0	100	100	100	100	100	0	0	0	0	0
6	Antigua and Barbuda	2.4	3.4	3.2	3.1	2.9	n/a	n/a	n/a	n/a	n/a	100	100	100	100	100	n/a	n/a	n/a	n/a	n/a
7	Argentina	0.3	0.3	0.3	0.3	0.3	61	60.2	59	59.5	58.6	63.2	63.8	64	63.3	62.4	33.4	32	31.9	32.6	31.1
8	Armenia	4.5	5.2	2.2	2	3.7	0	0	0	0	0	100	100	100	100	100	0	0	0	0	0
9	Australia	0	0	0	0	0	0	0	0	0	0	53.7	57.6	59.3	60.4	59.6	27.8	24	21.3	23.4	24.2
10	Austria	0	0	0	0	0	59.8	59.8	60.6	61	61.7	59.4	58.7	60.7	61.3	61.3	26.6	25.6	23.8	23.2	23.3
11	Azerbaijan	1.5	1.7	2.5	4.7	7.7	0	0	0	0	0	100	100	100	90.5	97.7	0	0	0	0	2.3
12	Bahamas	0	0	0	0	0.3	0	0	0	0	0	100	100	100	100	100	n/a	n/a	n/a	n/a	n/a
13	Bahrain	0	0	0	0	0	0.4	0.4	0.4	0.4	0.3	70.7	70.1	70.1	70	69.3	25.4	26.2	26	26.3	27.2
14	Bangladesh	10	12.6	11.8	13.8	13.3	0	0	0	0	0	94	93	93.2	93.2	93.2	0	0	0	0	0
15	Barbados	4.9	4.5	4.2	4	4.6	0	0	0	0	0	75.8	76.3	77	77.3	76.6	24.2	23.7	23	22.7	23.4
16	Belarus	0.1	0	0	0	0	19	20.8	19.9	22.8	24.8	100	100	100	99.6	99.7	0	0	0	0.4	0.3
17	Belgium	0	0	0	0	0	89.5	89.3	86.6	82.2	77.6	48.8	50.6	49.6	58.4	58.8	7.1	7.4	7.3	7.1	6.8
18	Belize	5.5	3.6	3.1	2.9	6.1	0	0	0	0	0	100	100	100	100	100	0	0	0	0	0
19	Benin	20.9	20.1	20.4	21.3	21.5	0	0	0	0	0	99.9	99.9	99.9	99.9	99.9	n/a	n/a	n/a	n/a	n/a
20	Bhutan	32.1	30.6	29.2	42	38.2	0	0	0	0	0	100	100	100	100	100	0	0	0	0	0
21	Bolivia	6	5.2	9.6	12.1	12.2	65.3	64.8	62	66.7	66.3	85.7	85.7	85.5	85.4	85.7	7.8	7.8	8.1	7.9	7.7
22	Bosnia and Herzegovina	15	8	6.2	7.9	2.4	0	0	0	0	0	100	100	100	100	100	0	0	0	0	0
23	Botswana	1.8	1.4	1.4	1.3	0.4	0	0	0	0	0	26.3	28.8	30.3	30.8	35.3	24.1	23.8	22.7	20.8	20.5
24	Brazil	0.2	0.3	0.5	0.5	0.5	0	0	0	0	0	66.9	66.9	67.1	64.9	64.1	33.1	33.1	32.9	35.1	35.9
25	Brunei Darussalam	n/a	n/a	n/a	n/a	n/a	0	0	0	0	0	100	100	100	100	100	0	0	0	0	0
26	Bulgaria	0.1	0	0.2	2.5	2.1	7.7	11.3	7.8	9.7	30.1	100	100	100	100	98	0	0	0	0	0
27	Burkina Faso	32.5	24.7	26.4	23.9	25.6	0	0	0	0	0	99.6	97.3	97.4	97.4	97.4	n/a	n/a	n/a	n/a	n/a
28	Burundi	30.5	35.2	39.6	40.4	43.7	0	0	0	0	0	100	100	100	100	100	0	0	0	0	0
29	Cambodia	13.5	12	13.4	18.8	19.7	0	0	0	0	0	89.9	90.2	90.1	85.4	84.6	0	0	0	0	0
30	Cameroon	5.9	6	6.1	5.7	6.3	0	0	0	0	0	87	85.5	84.1	81.9	81.6	n/a	n/a	n/a	n/a	n/a
31	Canada	0	0	0	0	0	1.8	1.8	1.9	2	2	56	55.2	55.3	54.3	52.3	36.5	38.4	37.6	39.1	39.3
32	Cape Verde	12.9	13.5	7.2	9.7	20.3	0	0	0	0	0	99.9	99.9	99.8	99.9	99.8	0.1	0.1	0.2	0.1	0.2
33	Central African Republic	14.7	25.4	28.4	30.8	32.4	0	0	0	0	0	95.2	95.3	95.1	95.5	95.4	0	0	0	0	0
34	Chad	66.9	58.7	65.2	59.7	62.9	0	0	0	0	0	80.4	80.6	82	81.6	80.9	n/a	n/a	n/a	n/a	n/a
35	Chile	0.2	0.1	0.1	0.1	0.1	83.6	75.7	77.3	71.8	71.8	66.2	66.2	65.5	59.7	59.6	33.7	33.7	34.5	40.2	40.3
36	China	0.3	0.2	0.3	0.2	0.2	58	53	51.4	50.7	50.7	94.2	94	94.9	95.2	95.4	0.4	0.6	0.4	0.4	0.4
37	Colombia	0.3	0.5	0.5	0.4	0.2	16.7	22.8	20.2	19.6	25	85	76.2	73.2	65.1	65.2	15	23.8	26.8	34.8	34.8
38	Comoros	58.5	44	44.5	42.9	39.9	0	0	0	0	0	100	100	100	100	100	0	0	0	0	0
39	Congo	3.1	3.6	4.7	4	3.3	0	0	0	0	0	100	100	100	100	100	n/a	n/a	n/a	n/a	n/a
40	Cook Islands	0.2	33.4	26.8	25.4	23.2	0	0	0	0	0	100	100	100	100	100	0	0	0	0	0
41	Costa Rica	1.7	1.7	1.6	1.3	1.3	88.1	89.8	89.6	90.2	90.8	90.1	91.5	91.6	91.8	92.1	2.1	1.8	1.6	1.6	1.5
42	Côte d'Ivoire	2.6	3.1	6	2.1	3.2	0	0	0	0	0	87	88.1	88.1	89.2	89.7	13	11.9	11.9	10.8	10.3
43	Croatia	0.2	0.2	0.4	0.3	0.1	86.6	91.7	97.9	97.8	94.9	100	100	100	100	100	0	0	0	0	0
44	Cuba	0.1	0.1	0.2	0.2	0.2	0	0	0	0	0	72.8	78.5	76	75.6	76.8	0	0	0	0	0
45	Cyprus	0	0	0	0	2.3	44.7	44.6	47.3	48.1	48.2	98.2	98.8	98.4	97.9	98	1.8	1.2	1.6	2.1	2
46	Czech Republic	0	0	0	0	0	89.5	90.2	89.4	89.4	86.1	100	100	100	100	100	0	0	0	0	0
47	Democratic People's Republic of Korea	n/a	0.2	0.2	0.3	0.3	0	0	0	0	0	100	100	100	100	100	0	0	0	0	0
48	Democratic Republic of Congo	11	12.6	5.7	6.6	18	0	0	0	0	0	100	100	100	100	100	0	0	0	0	0
49	Denmark	0	0	0	0	0	0	0	0	0	0	92.1	92	90.4	90.9	90.8	7.9	8	9.6	9.1	9.2
50	Djibouti	29.3	29.2	29.4	29.5	30	0	0	0	0	0	53.7	54.5	54.1	53.9	55.2	0	0	0	0	0
51	Dominica	3.2	2.3	2.1	1.3	0.9	0	0	0	0	0	100	100	100	100	100	0	0	0	0	0
52	Dominican Republic	1.5	3.2	3.2	2.5	1.8	26.8	21.4	20.3	22.4	22.6	88.6	88.4	88.4	88.4	88.4	0.1	0.4	0.4	0.4	0.4
53	Ecuador	2.1	1.8	3.2	3.2	1.9	32.8	36	37.9	38.7	45.3	74.3	74.3	71.6	72.7	73.8	7.8	7.8	9.4	8.3	9.5
54	Egypt	1.9	2.1	1.8	1.8	2	28	28.4	29.5	29.5	29.7	91.5	91.6	91.9	92	92.2	0.5	0.6	0.5	0.5	0.5
55	El Salvador	3.4	2.9	1.5	0.9	0.9	43.3	41.7	44	44.2	44.5	95.4	94	90.2	95.6	94.9	4.4	5.8	9.6	4.2	4.9

Annex Table 5 Selected national health accounts indicators: measured levels of expenditure on health, 1997–2001

Figures computed by WHO to assure comparability;[a] they are not necessarily the official statistics of Member States, which may use alternative rigorous methods.

	Member State	Total expenditure on health as % of GDP					General government expenditure on health as % of total expenditure on health					Private expenditure on health as % of total expenditure on health					General government expenditure on health as % of total government expenditure				
		1997	1998	1999	2000	2001	1997	1998	1999	2000	2001	1997	1998	1999	2000	2001	1997	1998	1999	2000	2001
56	Equatorial Guinea	3	4.1	2.8	2.1	2	63.1	62	61.9	62.5	60.4	36.9	38	38.1	37.5	39.6	10.4	8.3	9.9	10	10
57	Eritrea	4.4	5	5.4	5.6	5.7	65.8	66.1	67.6	67.2	65.1	34.2	33.9	32.4	32.8	34.9	5.3	4.5	4.5	4.5	4.5
58	Estonia	5.5	6	6.5	5.9	5.5	86.7	86.4	80.4	76.8	77.8	13.3	13.6	19.6	23.2	22.2	12.6	13.4	12.7	12.4	12.1
59	Ethiopia	3.4	3.6	3.5	3.2	3.6	37.9	39.3	37.7	34.5	40.5	62.1	60.7	62.3	65.5	59.5	5.8	5.9	4.3	3.2	4.9
60	Fiji	3.9	4.1	3.7	3.9	4	66.7	65.4	65.2	65.2	67.1	33.3	34.6	34.8	34.8	32.9	7.4	6.9	7.5	7.2	6.9
61	Finland	7.3	6.9	6.9	6.6	7	76.1	76.3	75.3	75.1	75.6	23.9	23.7	24.7	24.9	24.4	9.8	10	10	10.3	10.7
62	France	9.4	9.3	9.3	9.4	9.6	76.2	76	76	75.8	76	23.8	24	24	24.2	24	13	13.1	13.2	13.4	13.7
63	Gabon	2.9	3.7	3.5	3.3	3.6	65.6	66.8	64.9	50.2	47.9	34.4	33.2	35.1	49.8	52.1	5.9	7.4	7.5	7.2	7.3
64	Gambia	6.1	7.1	6.7	6.3	6.4	47.2	42.9	46.9	46.8	49.4	52.8	57.1	53.1	53.2	50.6	11.3	13.2	13.8	13.3	13.6
65	Georgia	2.9	2.4	2.5	3.4	3.6	39.9	45.4	37.6	33.5	37.8	60.1	54.6	62.4	66.5	62.2	5.3	5.1	4.3	5.9	6.7
66	Germany	10.7	10.6	10.7	10.6	10.8	75.3	74.8	74.8	75	74.9	24.7	25.2	25.2	25	25.1	16.3	16.3	16.3	17.3	16.6
67	Ghana	4.1	4.3	4.2	4.3	4.7	47.6	53.8	53.9	55.9	59.6	52.4	46.2	46.1	44.1	40.4	9.4	9	9.2	8.1	8.6
68	Greece	9.4	9.4	9.6	9.4	9.4	52.8	52.1	53.4	56.1	56	47.2	47.9	46.6	43.9	44	10.8	10.5	11	10.8	11.2
69	Grenada	4.7	4.8	4.8	4.9	5.3	66.1	65.8	69.7	70.1	71.9	33.9	34.2	30.3	29.9	28.1	10.6	11.3	12.3	12.3	12.4
70	Guatemala	3.8	4.4	4.7	4.7	4.8	37.2	47.4	48.3	47.6	48.3	62.8	52.6	51.7	52.4	51.7	11.3	14	15.5	16.3	15.7
71	Guinea	3.6	3.3	3.6	3.4	3.5	56.3	51.4	55.3	53.4	54.1	43.7	48.6	44.7	46.6	45.9	9.3	9.6	9.4	10.9	11.3
72	Guinea-Bissau	5.4	5.5	5.9	6.1	5.9	43.2	44.5	48.5	55.3	53.8	56.8	55.5	51.5	44.7	46.2	7.3	9.8	9.1	7.7	7.4
73	Guyana	4.8	5	4.8	5.1	5.3	83.5	83.4	84	82.7	79.9	16.5	16.6	16	17.3	20.1	9.3	9.3	9.1	9.3	9.3
74	Haiti	4.9	5.1	4.9	4.8	5	51.7	49.9	51	50.7	53.4	48.3	50.1	49	49.3	46.6	12	11.7	11	12.3	14.1
75	Honduras	5.4	5.6	5.6	6	6.1	53	53.8	51.8	53.5	53.1	47	46.2	48.2	46.5	46.9	13.7	14.6	13.7	13.6	13.8
76	Hungary	7	6.9	6.8	6.7	6.8	81.3	79.4	78.1	75.5	75	18.7	20.6	21.9	24.5	25	11.4	10.1	11.4	11.7	11.5
77	Iceland	8.2	8.6	9.5	9.3	9.2	83.1	83	84	83.7	82.9	16.9	17	16	16.3	17.1	16.3	16.8	18.3	18	17.5
78	India	5.3	5	5.2	5.1	5.1	15.7	18.4	17.9	17.6	17.9	84.3	81.6	82.1	82.4	82.1	3.2	3.5	3.3	3.1	3.1
79	Indonesia	2.4	2.5	2.6	2.7	2.4	23.7	27.2	28	23.7	25.1	76.3	72.8	72	76.3	74.9	2.8	3.2	3.6	3.2	3
80	Iran, Islamic Republic of	5.9	6	6.5	6.4	6.3	45	43.9	41.9	41.5	43.5	55	56.1	58.1	58.5	56.5	10.5	10.8	11.2	11.8	12
81	Iraq	3.4	3.3	3.3	3.3	3.2	32.7	31.7	31	31.2	31.8	67.3	68.3	69	68.8	68.2	4.2	4.3	4.5	4.5	4.6
82	Ireland	6.4	6.2	6.2	6.4	6.5	74.6	76.5	72.8	73.3	76	25.4	23.5	27.2	26.7	24	12.9	13.6	13.1	14.6	14
83	Israel	8.1	8.1	8.2	8.2	8.7	74	72	71	69.8	69.2	26	28	29	30.2	30.8	12.1	11.4	11.8	12.1	11.5
84	Italy	7.7	7.7	7.8	8.2	8.4	72.2	71.8	72	73.4	75.3	27.8	28.2	28	26.6	24.7	10.9	11.1	11.5	12.8	13
85	Jamaica	6.5	6.5	6.1	6.2	6.8	56.2	59.5	50.9	47	42.1	43.8	40.5	49.1	53	57.9	7.7	7.7	5.9	5.3	4.4
86	Japan	6.8	7.1	7.5	7.7	8	77.2	77.4	78.1	77.7	77.9	22.8	22.6	21.9	22.3	22.1	14.9	13.2	15.3	15.5	16.4
87	Jordan	8.2	8.1	8.6	9.2	9.5	54.5	57	50.8	46.5	47	45.5	43	49.2	53.5	53	11.7	12.4	12.4	12.5	12.8
88	Kazakhstan	3.2	3.5	3.5	3.3	3.1	72.9	70	63.5	62.9	60.4	27.1	30	36.5	37.1	39.6	8.9	9.4	9.6	9	8
89	Kenya	8	8.4	7.9	8.7	7.8	21.7	24.1	18.7	23.8	21.4	78.3	75.9	81.3	76.2	78.6	6.1	7.2	5.1	8.6	6.2
90	Kiribati	8.7	8.3	7.8	8.3	8.6	99.1	99	98.9	98.8	98.8	0.9	1	1.1	1.2	1.2	11.2	10.9	9.7	10	9.3
91	Kuwait	3.7	4.4	3.9	3.5	3.9	79.5	78.8	78.7	78.7	78.8	20.5	21.2	21.3	21.3	21.2	8.4	8	8.2	8.9	8.1
92	Kyrgyzstan	4.1	4.7	4.4	4.2	4	67.9	59.5	53.9	48.3	48.7	32.1	40.5	46.1	51.7	51.3	10.5	10.1	10.2	9.5	9
93	Lao People's Democratic Republic	2.9	2.5	3	2.9	3.1	62.1	48.6	49.4	53.3	55.5	37.9	51.4	50.6	46.7	44.5	9.8	5.7	8.8	7.6	8.7
94	Latvia	6.8	6.8	6.9	6.3	6.4	56.8	60.7	59.7	55.8	52.5	43.2	39.3	40.3	44.2	47.5	10.1	10.6	10	8.8	9.1
95	Lebanon	11.8	12.4	12.1	12.6	12.2	31.1	27.2	26.7	29.3	28.1	68.9	72.8	73.3	70.7	71.9	8.6	9.8	9	8.3	9.5
96	Lesotho	5.3	5.9	6.1	6.1	5.5	76	78.3	80.9	80.8	78.9	24	21.7	19.1	19.2	21.1	12.4	11.5	11.9	12	12
97	Liberia	3.2	3.5	4	4.2	4.3	69.1	73.4	76.5	76.2	75.9	30.9	26.6	23.5	23.8	24.1	9.3	10.1	10.8	10.7	10.6
98	Libyan Arab Jamahiriya	3.4	3.7	3.5	2.8	2.9	47.9	49.6	49.1	51.5	56	52.1	50.4	50.9	48.5	44	6.2	5.3	5.6	4.9	5
99	Lithuania	6	6.4	6.3	6.2	6	76.2	75.1	73.5	70.7	70.5	23.8	24.9	26.5	29.3	29.5	13.6	14.8	11.7	13.9	14
100	Luxembourg	6	5.9	6	5.5	6	91.1	90.9	89.4	89.3	89.9	8.9	9.1	10.6	10.7	10.1	12.5	12.7	12.9	12.3	13.3
101	Madagascar	1.8	2.7	2.5	2.4	2	78.4	64.4	58.5	64.8	65.9	21.6	35.6	41.5	35.2	34.1	9	10.3	8.4	9.2	7.7
102	Malawi	8.7	8.5	8.7	8.2	7.8	35.6	35.5	37.8	36.9	35	64.4	64.5	62.2	63.1	65	12.2	12.9	13.9	12.2	12.3
103	Malaysia	2.8	3	3.1	3.3	3.8	53.5	51.6	52.9	53.1	53.7	46.5	48.4	47.1	46.9	46.3	6.1	5.1	6	6.1	6.5
104	Maldives	6.5	6.4	6.8	6.9	6.7	81.9	81.8	82.5	84	83.5	18.1	18.2	17.5	16	16.5	10.9	10.1	10.4	10.9	10.3
105	Mali	4.2	4.2	4.1	4.7	4.3	43.3	37.5	32.6	38.9	38.6	56.7	62.5	67.4	61.1	61.4	8.2	7	5.7	7.8	6.8
106	Malta	8.6	8.4	8.3	8.8	8.8	67.9	69.3	67.5	68.5	68.5	32.1	30.7	32.5	31.5	31.5	11.7	11.9	11.8	13.2	12.8
107	Marshall Islands	9.9	9.7	9.5	9.8	9.8	70.5	66.4	65.2	65	64.7	29.5	33.6	34.8	35	35.3	10.7	10.9	10.8	9.6	9.6
108	Mauritania	3.4	3.6	3.6	3.7	3.6	74.5	71.1	71.9	73.5	72.4	25.5	28.9	28.1	26.5	27.6	10.2	10.1	10.5	11	10.3
109	Mauritius	3	3.2	3.1	3.3	3.4	61.2	62.6	62	58.7	59.5	38.8	37.4	38	41.3	40.5	6.8	7	7.2	6.6	7.6
110	Mexico	5.5	5.6	5.7	5.7	6.1	45.3	46.6	46.9	45.7	44.3	54.7	53.4	53.1	54.3	55.7	15	16.8	17.2	16.6	16.7

	Member State	External resources for health as % of total expenditure on health					Social security expenditure on health as % of general govenment expenditure on health					Out-of-pocket expenditure as % of private expenditure on health					Private prepaid plans as % of private expenditure on health				
		1997	1998	1999	2000	2001	1997	1998	1999	2000	2001	1997	1998	1999	2000	2001	1997	1998	1999	2000	2001
56	Equatorial Guinea	23.6	29.2	14.9	17.2	10.6	0	0	0	0	0	95.1	95.1	89.3	70.5	52.3	0	0	0	0	0
57	Eritrea	48.1	41.5	49.8	51.1	52.3	0	0	0	0	0	100	100	100	100	100	0	0	0	0	0
58	Estonia	1.7	1.5	3.5	0.9	0	84.6	77.1	82	85.9	86	97.9	96.6	71.3	84.9	84.7	0	0	4.1	4.1	4.8
59	Ethiopia	9.3	23.5	27.6	29.6	34.3	0.7	0.7	0.8	1	0.8	86.2	85.7	85.4	84.6	84.7	0	0	0	0	0
60	Fiji	4.2	7.7	11.1	10.9	10.1	0	0	0	0	0	100	100	100	100	100	0	0	0	0	0
61	Finland	0	0	0	0	0	18.7	19.4	19.8	20.5	20.8	82.4	81.9	82.2	81.9	82.7	11	11.1	10.8	10.5	8.3
62	France	0	0	0	0	0	96.8	96.8	96.7	96.7	96.5	43.5	43.1	43	43.1	42.6	52.2	52.6	52.6	52.6	53.1
63	Gabon	3.7	4	4.6	1.3	1.8	0	0	0	0	0	100	100	100	100	100	0	0	0	0	0
64	Gambia	29.4	25	28.2	26.1	26.6	0	0	0	0	0	89.2	86.3	88.6	88.9	90	0	0	0	0	0
65	Georgia	5.4	7.1	7.3	3.1	5.1	54.3	39.3	54.4	47.9	41.5	99.7	99.5	99.5	99.7	99.7	0.3	0.5	0.5	0.3	0.3
66	Germany	0	0	0	0	0	90.7	91.4	91.5	91.6	91.8	43.9	44.5	43.2	42.2	42.4	32	31.7	32.5	33.3	33.5
67	Ghana	6.8	8.2	8.6	13.2	23.2	0	0	0	0	0	100	100	100	100	100	0	0	0	0	0
68	Greece	0	0	0	0	0	26.9	37.5	35.4	31.9	35	72.1	71	69.5	74.5	73.9	4.3	4.2	4.1	4.4	4.4
69	Grenada	1	0.9	0	0	0	0	0	0	0	0	100	100	100	100	100	0	0	0	0	0
70	Guatemala	3.2	5.4	5.3	4.6	1.4	49	55.3	54.8	57.1	54.1	92.2	93.2	85.6	86.2	85.7	3.8	4.5	5.4	5.2	5.3
71	Guinea	14	14	14.3	19.1	20.5	0	0	0	0	0	100	100	100	100	100	0	0	0	0	0
72	Guinea-Bissau	22	29.4	30	39.8	38.6	0.2	0.2	0.2	0.1	0.1	100	100	100	100	100	0	0	0	0	0
73	Guyana	4.7	3.6	4	3.1	2.2	0	0	0	0	0	100	100	100	100	100	0	0	0	0	0
74	Haiti	36.5	36.6	38.3	39.2	42.9	0	0	0	0	0	43.2	40.2	43.3	43.3	45.3	n/a	n/a	n/a	n/a	n/a
75	Honduras	12.1	10.4	10.1	8.7	7.5	16.7	15.4	16.6	16.5	17.3	89.3	89	89.1	88.9	88.9	7.5	7.5	7.5	7.6	7.5
76	Hungary	0	0	0	0	0	82.8	83.4	83.8	83.9	83.2	n/a	84.9	86.3	87	85.5	n/a	0.2	0.5	0.8	1.3
77	Iceland	0	0	0	0	0	31.5	29.8	27.7	29.6	28.1	100	100	100	100	100	0	0	0	0	0
78	India	2.3	2.4	2.2	2.2	0.4	n/a	n/a	n/a	n/a	n/a	100	100	100	100	100	n/a	n/a	n/a	n/a	n/a
79	Indonesia	2.9	6.4	9.5	8.3	6.5	14.1	9	7.3	7.5	7.5	95.7	93.3	89.6	91.8	91.8	4.3	6.7	10.4	8.2	8.2
80	Iran, Islamic Republic of	0	0	0	0.1	0.1	38.8	40.8	41	40.6	40.8	94.5	93.7	94.4	94.8	94.2	2.5	3	2.5	2.3	2.6
81	Iraq	0	0	0.1	0	0.1	0	0	0	0	0	100	100	100	100	100	0	0	0	0	0
82	Ireland	0	0	0	0	0	1.1	1.1	1.1	1.2	1	53.1	45.6	51.4	50.5	55.2	34.1	38.1	29.3	28.4	28.4
83	Israel	0	0	0.3	0.4	0.1	33.1	34.3	34.9	36.4	37.1	100	100	100	100	100	0	0	0	0	0
84	Italy	0	0	0	0	0	0.4	0.1	0.1	0.1	0.3	86.7	86.9	85.6	84.9	82.1	3.6	3.3	3.4	3.3	3.6
85	Jamaica	2.3	2.5	2.5	2	3	0	0	0	0	0	69.4	66.7	70.3	65.6	73.4	25	27.2	24.3	29.5	22.5
86	Japan	0	0	0	0	0	87.1	84.5	84	83.5	83.6	74.8	78.2	77.8	74.5	74.9	2.5	2.6	2.6	2.8	1.4
87	Jordan	1.5	4.1	3.5	4.5	4.4	0.7	0.6	0.8	0.8	0.7	78.5	77.9	75.8	74.1	73.9	5.8	5.9	5.7	5.6	7.4
88	Kazakhstan	0.5	0.4	3.5	4	3.5	0	0	0	0	0	100	100	100	100	100	0	0	0	0	0
89	Kenya	7.3	7.9	9.6	9.7	9.8	0	0	0	0	0	70	70.7	68.5	69.6	67.6	7.3	6.6	9.1	8.7	9.5
90	Kiribati	n/a	n/a	n/a	2.2	4.4	0	0	0	0	0	100	100	100	100	100	0	0	0	0	0
91	Kuwait	0	0	0	0	0	0	0	0	0	0	100	100	100	100	100	0	0	0	0	0
92	Kyrgyzstan	8.4	8.8	14.3	17	n/a	0.6	4.4	8.4	10.1	10.3	100	100	100	100	100	0	0	0	0	0
93	Lao People's Democratic Republic	15.8	20.4	19.5	19.7	21.1	n/a	n/a	n/a	n/a	n/a	80.1	80	80	80	80	n/a	n/a	n/a	n/a	n/a
94	Latvia	0	0.8	0.8	0.7	0.7	28.4	29.9	29.9	31.8	27.4	100	100	100	100	99.7	0	0	0	0	0.3
95	Lebanon	0.6	1.9	0.7	0.2	0.2	42.3	45.6	47.7	43	50.6	80.9	81	81.8	81.1	81.2	16.7	16.7	15.8	16.4	16.5
96	Lesotho	5.3	3.9	3.2	4.7	6	0	0	0	0	0	100	100	100	100	100	0	0	0	0	0
97	Liberia	59.4	65.5	66.2	61.9	57.2	0	0	0	0	0	86.2	87.7	88.4	84	84.2	0	0	0	0	0
98	Libyan Arab Jamahiriya	0	0	0	0	0	0	0	0	0	0	100	100	100	100	100	0	0	0	0	0
99	Lithuania	0	0	1.1	1.4	1	82.7	89.9	92.2	90.7	88.3	91.9	92	91.5	92.1	91.7	0	0	0	0	0
100	Luxembourg	0	0	0	0	0	86	82.7	77	82.9	77.6	81.9	82.4	73.9	73.2	74.6	18.1	17.6	13.4	13.8	14.6
101	Madagascar	35.8	28.6	36.3	38.1	36.8	0	0	0	0	0	73.2	89.2	89.7	87.7	85	26.8	10.8	10.3	12.3	15
102	Malawi	22.8	20.4	22.9	32.3	26.5	0	0	0	0	0	40.3	40.4	41.3	39.7	43.7	1.4	1.8	1.5	1.7	1.6
103	Malaysia	0.9	1.1	1	0.8	0	0.8	0.9	1	0.9	1.1	n/a	94.2	93.9	93.4	92.8	n/a	5.8	6.1	6.6	7.2
104	Maldives	4.2	3.6	2.6	2.2	1.9	0	0	0	0	0	100	100	100	100	100	0	0	0	0	0
105	Mali	32	24.2	18.8	24.2	20.8	0	0	0	0	0	77.5	77.6	75.6	73.5	72.4	12.4	13.2	15.3	17.8	18.7
106	Malta	0	0	0	0	0	64.5	68.9	68	59.9	58.7	100	100	100	100	100	0	0	0	0	0
107	Marshall Islands	13.7	13.5	38.2	36.5	25.4	0	0	0	0	0	100	100	100	100	100	0	0	0	0	0
108	Mauritania	24.8	19.7	21.5	24.4	23.2	0	0	0	0	0	100	100	100	100	100	0	0	0	0	0
109	Mauritius	1.6	1.4	1.2	1.1	1.6	5.2	6.1	6.5	7.8	8.1	100	100	100	100	100	0	0	0	0	0
110	Mexico	0.2	0.8	0.7	0.6	0.5	68.5	68.1	69.2	67.7	66.5	92.5	92.5	92.4	92.3	92.4	3.9	3.9	4.1	4.7	4.9

Annex Table 5 Selected national health accounts indicators: measured levels of expenditure on health, 1997–2001

Figures computed by WHO to assure comparability;[a] they are not necessarily the official statistics of Member States, which may use alternative rigorous methods.

	Member State	Total expenditure on health as % of GDP					General government expenditure on health as % of total expenditure on health					Private expenditure on health as % of total expenditure on health					General government expenditure on health as % of total government expenditure				
		1997	1998	1999	2000	2001	1997	1998	1999	2000	2001	1997	1998	1999	2000	2001	1997	1998	1999	2000	2001
111	Micronesia, Federated States of	8.3	8	7.9	7.9	7.8	73.7	72.6	71.8	71.8	72	26.3	27.4	28.2	28.2	28	9.8	7.9	7.9	8.5	8.5
112	Monaco	7	7.2	7.4	7.4	7.6	54.7	53.6	52.7	54.5	56.1	45.3	46.4	47.3	45.5	43.9	15.9	16.1	16.3	16.8	17.7
113	Mongolia	5	6.2	6.1	6.3	6.4	62.7	65.4	66.5	70.3	72.3	37.3	34.6	33.5	29.7	27.7	9.1	9	9.8	10.5	10.5
114	Morocco	4.3	4.4	4.4	4.7	5.1	26	28.3	29.1	34	39.3	74	71.7	70.9	66	60.7	3.7	4	3.9	4.7	5.3
115	Mozambique	5	4.9	5	5.7	5.9	60.5	62	64	66.6	67.4	39.5	38	36	33.4	32.6	15.1	15.5	16.5	18.2	18.9
116	Myanmar	2.1	2	2	2	2.1	14.3	10.6	11.7	17.1	17.8	85.7	89.4	88.3	82.9	82.2	2.7	2.5	3	5	5.7
117	Namibia	6.9	6.8	7	6.9	6.7	71.1	72.2	73.2	68.9	69.3	28.9	27.8	26.8	31.1	30.7	13	13	13.1	12.4	12.2
118	Nauru	7.6	7.9	7.7	7.7	7.5	89.1	89	89.1	88.9	88.7	10.9	11	10.9	11.1	11.3	9.1	9.1	9.2	9.2	9.1
119	Nepal	5.4	5.5	5.3	5.2	5.2	31.3	33.3	29.8	30.1	29.7	68.7	66.7	70.2	69.9	70.3	9.3	9.9	9	9	8.1
120	Netherlands	8.2	8.6	8.7	8.6	8.9	67.8	64.4	63.3	63.4	63.3	32.2	35.6	36.7	36.6	36.7	11.5	11.7	11.7	12.1	12.2
121	New Zealand	7.5	7.9	8	8	8.3	77.3	77	77.9	78	76.8	22.7	23	22.1	22	23.2	12.7	13.5	14.1	14.5	14.8
122	Nicaragua	6.2	6	5.8	7.1	7.8	53.8	60.3	54	52.5	48.5	46.2	39.7	46	47.5	51.5	18.7	20.2	13.8	17	17.9
123	Niger	3.4	3.3	3.2	3.6	3.7	41.7	43	43.6	43.1	39.1	58.3	57	56.4	56.9	60.9	8.9	8.3	7.8	8.6	7.7
124	Nigeria	2.8	3.1	3	3	3.4	11.7	15.4	16	14.1	23.2	88.3	84.6	84	85.9	76.8	2.1	2.3	1.7	1.7	1.9
125	Niue	7.6	7.4	7.9	8	7.7	97.1	97	97	97	97	2.9	3	3	3	3	13	13.9	15.3	15.4	14.8
126	Norway	7.8	8.5	8.5	7.6	8	84.3	84.7	85.2	85.2	85.5	15.7	15.3	14.8	14.8	14.5	14	14.5	15.1	14.9	15.2
127	Oman	3.4	3.8	3.5	3	3	81.9	82.3	82.2	81.1	80.7	18.1	17.7	17.8	18.9	19.3	7.4	7.6	7.7	7	6.5
128	Pakistan	3.8	3.9	4	4.1	3.9	27.2	29.1	25.6	24.5	24.4	72.8	70.9	74.4	75.5	75.6	3.8	4.2	3.7	3.3	3.5
129	Palau	8.5	8.9	9	9	9.2	91.6	92.9	91.4	91.7	92	8.4	7.1	8.6	8.3	8	10.7	11.3	11.3	11.3	11.6
130	Panama	7.4	7.4	7.6	7.6	7	68.3	70.2	69.9	69.2	69	31.7	29.8	30.1	30.8	31	18.7	18.5	18.5	18.4	18.4
131	Papua New Guinea	3.2	3.8	4.2	4.3	4.4	89	90.9	89.9	89.7	89	11	9.1	10.1	10.3	11	9.6	12.3	13.3	12.9	13
132	Paraguay	7.6	7.3	7.9	7.9	8	32.8	37.4	39.4	38.3	38.3	67.2	62.6	60.6	61.7	61.7	13.6	14.9	17.4	16.8	16.9
133	Peru	4.4	4.6	4.9	4.7	4.7	51.4	54.8	55.9	55.4	55	48.6	45.2	44.1	44.6	45	11.6	12.9	13	12.7	12.1
134	Philippines	3.6	3.5	3.5	3.4	3.3	43.4	43.4	44.8	48.2	45.2	56.6	56.6	55.2	51.8	54.8	6.7	6.6	6.5	7.1	6.2
135	Poland	6.1	6.4	6.2	5.8	6.1	72	65.4	71.1	70	71.9	28	34.6	28.9	30	28.1	9.5	9.4	10.6	10.2	10.9
136	Portugal	8.6	8.6	8.7	9.1	9.2	64.8	65.5	67.6	68.5	69	35.2	34.5	32.4	31.5	31	12.4	12.8	13	13.7	13.7
137	Qatar	3.9	4.5	3.8	2.8	3.1	76.8	76.9	76	74.2	73.5	23.2	23.1	24	25.8	26.5	7	7.6	7.5	6.7	6.5
138	Republic of Korea	5	5.1	5.6	5.9	6	41	46.2	43.1	44.4	44.4	59	53.8	56.9	55.6	55.6	9	9.3	9.7	10.7	9.5
139	Republic of Moldova	8.3	7.2	5.3	5.2	5.1	73	60.3	54.4	55.9	55.8	27	39.7	45.6	44.1	44.2	14.6	12.1	9.8	9.9	10.6
140	Romania	5	6.6	6.8	6.6	6.5	66.7	74.2	77.8	78.9	79.2	33.3	25.8	22.2	21.1	20.8	9.9	13.7	14.1	14.2	15.9
141	Russian Federation	5.8	5.8	5.4	5.3	5.4	72.9	68.9	64.7	69.9	68.2	27.1	31.1	35.3	30.1	31.8	9.3	9.8	9.4	10.8	10.7
142	Rwanda	5	5	5.5	5.6	5.5	48.8	51.3	54	52.9	55.5	51.2	48.7	46	47.1	44.5	12.5	13.8	13.5	14.8	14.2
143	Saint Kitts and Nevis	4.8	4.8	4.7	4.7	4.8	66.3	66.7	66.2	66.3	66.3	33.7	33.3	33.8	33.7	33.7	10.9	11	10.6	10.6	10.9
144	Saint Lucia	4.2	4.3	4.1	4.2	4.5	62.3	65.6	65.3	65.2	64.6	37.7	34.4	34.7	34.8	35.4	9	8.8	8.3	8.2	8
145	Saint Vincent and the Grenadines	6.1	5.9	6	6	6.1	63.8	62.5	62.7	65.1	63.5	36.2	37.5	37.3	34.9	36.5	9.2	8.7	9.1	9.3	9.3
146	Samoa	5.4	5.8	6.2	5.8	5.8	73.6	73.5	74.1	76.9	82.2	26.4	26.5	25.9	23.1	17.8	11.5	13.1	12.9	14.7	15.7
147	San Marino	5.9	6.1	6.3	6.7	6.8	75.1	75.4	75.8	77.1	78	24.9	24.6	24.2	22.9	22	11	12	12.4	13.4	13.8
148	Sao Tome and Principe	3	2.9	2.3	2.4	2.3	66.7	67.9	67.9	67.8	67.7	33.3	32.1	32.1	32.2	32.3	2.9	3.6	3.6	3.6	3.5
149	Saudi Arabia	5.3	5.2	4.5	4.4	4.6	77.3	76.3	73.7	74.4	74.6	22.7	23.7	26.3	25.6	25.4	11.4	11.5	11	9.9	10
150	Senegal	5.1	4.9	4.7	4.6	4.8	54.8	57.5	56.1	56.6	58.8	45.2	42.5	43.9	43.4	41.2	14.4	15	13	13.6	12.9
151	Serbia-Montenegro	11	9.9	9.2	7.6	8.2	74	71.3	70.9	77.6	79.2	26	28.7	29.1	22.4	20.8	21.1	17.5	15.9	14.7	15
152	Seychelles	6.7	6.4	6.2	5.9	6	72.3	69.4	68.8	66.5	68.2	27.7	30.6	31.2	33.5	31.8	8.1	7.5	7.4	6.7	7
153	Sierra Leone	3.3	3	3.7	4.3	4.3	46.8	44.2	53.8	60.4	61	53.2	55.8	46.2	39.6	39	8.9	9.4	9.4	9.3	9.4
154	Singapore	3.7	4.2	4	3.6	3.9	39	41.6	38.3	35.2	33.5	61	58.4	61.7	64.8	66.5	8.4	8.7	8.2	6.7	5.9
155	Slovakia	5.9	5.8	5.8	5.7	5.7	91.7	91.6	89.6	89.4	89.3	8.3	8.4	10.4	10.6	10.7	8.5	8.8	9.2	8.2	8.9
156	Slovenia	7.8	8.3	8.2	8	8.4	79.2	75.7	75.5	76	74.9	20.8	24.3	24.5	24	25.1	14.3	14.3	14	14.5	14.6
157	Solomon Islands	3.7	4.5	4.9	4.9	5	92	93	93.4	93.4	93.5	8	7	6.6	6.6	6.5	11.4	11.4	11.1	11.4	11.5
158	Somalia	2.6	2.7	2.7	2.6	2.6	45.5	46.1	45	44.8	44.6	54.5	53.9	55	55.2	55.4	4.4	4.4	4.2	4.2	4.2
159	South Africa	9	8.7	8.8	8.7	8.6	46.1	42.4	42.6	41.8	41.4	53.9	57.6	57.4	58.2	58.6	12.4	11.3	11.1	11.2	10.9
160	Spain	7.5	7.5	7.5	7.5	7.5	72.5	72.2	72.1	71.7	71.4	27.5	27.8	27.9	28.3	28.6	13	13.1	13.4	13.4	13.6
161	Sri Lanka	3.2	3.4	3.5	3.6	3.6	49.5	51.3	49	49.2	48.9	50.5	48.7	51	50.8	51.1	6	5.8	5.7	6.1	6.1
162	Sudan	3.5	3.7	3.7	3.9	3.5	19.6	24.4	22.9	28.7	18.7	80.4	75.6	77.1	71.3	81.3	9.1	12	9.5	9.3	4.6
163	Suriname	9.5	9.9	9.8	9.9	9.4	52.4	61.7	59.6	63.3	60.2	47.6	38.3	40.4	36.7	39.8	17.1	18.2	17.6	18.9	17
164	Swaziland	3.1	3.2	3.3	3.4	3.3	71.6	70.8	67.7	69.9	68.5	28.4	29.2	32.3	30.1	31.5	7.9	7.7	7	7.8	7.5
165	Sweden	8.2	8.3	8.4	8.4	8.7	85.8	85.8	85.7	85	85.2	14.2	14.2	14.3	15	14.8	11.2	11.8	12	12.4	13

	Member State	External resources for health as % of total expenditure on health					Social security expenditure on health as % of general govenment expenditure on health					Out-of-pocket expenditure as % of private expenditure on health					Private prepaid plans as % of private expenditure on health				
		1997	1998	1999	2000	2001	1997	1998	1999	2000	2001	1997	1998	1999	2000	2001	1997	1998	1999	2000	2001
111	Micronesia, Federated States of	n/a	n/a	22.5	22.1	16.2	0	0	0	0	0	35.7	35.7	35.7	35.7	35.7	0	0	0	0	0
112	Monaco	0	0	0	0	0	94.3	94.6	94.9	95.2	95.7	100	100	100	100	100	0	0	0	0	0
113	Mongolia	4.2	9	18.9	17.2	15.4	36.8	39.9	39.3	40.2	40.3	73.3	74.5	74.1	73.9	73.4	0	0	0	0	0
114	Morocco	2.6	2.2	1.5	1.7	1.4	9.8	9	9	7.6	5.8	74.3	74.4	74.3	74.3	74.1	22.8	22.5	22.7	22.6	22.7
115	Mozambique	53.1	44.2	40.3	38.2	36.9	0	0	0	0	0	42.8	40.5	39.2	39.3	39.3	0.6	0.5	0.6	0.5	0.5
116	Myanmar	0.4	0.4	0.3	0.4	0.2	3.6	3	2.1	2	1.8	99.6	99.7	99.8	99.6	99.6	0	0	0	0	0
117	Namibia	4.4	4.5	4.6	3.8	3.9	1.5	1.4	1.2	1.8	2	21.8	21.8	21.2	18.1	18.7	75.2	74.5	74.3	77.2	75.7
118	Nauru	n/a	n/a	n/a	n/a	n/a	0	0	0	0	0	100	100	100	100	100	0	0	0	0	0
119	Nepal	10.6	9.9	10.2	8.3	9.4	0	0	0	0	0	94.2	94.1	94.2	93.8	93.3	0	0	0	0	0
120	Netherlands	0	0	0	0	0	93.6	93.3	93.2	93.6	93.8	23.8	24.7	25	24.5	24.1	59.1	43.5	42.7	41.6	42.4
121	New Zealand	0	0	0	0	0	0	0	0	0	0	68.8	70.8	70.1	69.9	72	29.8	27.7	28.1	28.5	26.5
122	Nicaragua	10.8	11.1	10	7.7	7.7	24.3	23	31.5	27	31.3	97.1	96.9	93.9	91.9	93.1	0.9	1.7	0.7	2.7	4
123	Niger	13.7	17.7	9.2	20.9	16.9	0	0	0	0	0	84.5	83.4	82.7	83.4	85.4	3.4	2.9	3.2	3.2	2.9
124	Nigeria	1.3	1.2	3.8	7.2	7.1	0	0	0	0	0	100	100	100	100	100	0	0	0	0	0
125	Niue	n/a	n/a	n/a	n/a	n/a	0	0	0	0	0	100	100	100	100	100	0	0	0	0	0
126	Norway	0	0	0	0	0	0	0	0	0	0	96.6	96.6	96.6	96.7	96.8	0	0	0	0	0
127	Oman	0	0	0	0.1	0	0	0	0	0	0	46.4	51.1	47.5	41.7	42.9	0	0	0	0	0
128	Pakistan	2.7	2.2	2	3.8	1.9	43.9	41.6	44.9	39.6	43.3	100	100	100	100	100	0	0	0	0	0
129	Palau	12.5	13.5	11.9	11.4	11.8	0	0	0	0	0	100	100	100	100	100	0	0	0	0	0
130	Panama	1.4	1.3	1.3	1.2	0.6	60.6	66.2	58.9	57.2	57.9	82.7	82	81.8	81.3	81.2	17.2	18	18.2	18.7	18.7
131	Papua New Guinea	26.8	29	18.5	22.1	21.2	0	0	0	0	0	88.7	86.4	83.4	83.9	83.3	2	4.8	9.4	9.3	9.4
132	Paraguay	1.6	1.9	2	2	2	47.8	44.9	46.7	48.3	48.2	68.4	76.3	72.9	72.7	71.6	31.6	23.7	27.1	27.3	28.4
133	Peru	2.3	2.4	2	1.4	1.7	43	43.1	48.3	47.2	51.9	82.8	81.7	80	81.7	81.7	15.3	16.5	18	16	16.1
134	Philippines	2	2.8	3.7	3.5	3.5	11.8	8.8	11.4	14.7	17.2	82.9	82.6	79.5	79.2	78.2	15.6	15.9	18.6	18.6	19.8
135	Poland	0	0	0	0	0	0	0	83.4	82.4	76.7	92.7	92.8	92.3	92.4	92.4	7.3	7.2	7.7	7.6	7.6
136	Portugal	0	0	0	0	0	6.7	7.7	7.1	6.7	6.8	55.5	57.7	60.6	59.4	58.5	4.3	4.3	4.3	4.3	4.3
137	Qatar	0	0	0	0	0	0	0	0	0	0	25.3	24.7	26.8	31.9	33.7	0	0	0	0	0
138	Republic of Korea	0	0	0	0	0	71.9	74.5	75.2	77.3	77.2	78.2	77.4	75.7	74.2	74.3	11.3	12.9	13.6	15.6	17.2
139	Republic of Moldova	0.4	1	4.1	7.8	8.5	0	0	0	0	0	100	100	100	100	97.6	0	0	0	0	2.4
140	Romania	1	2.1	3	2	1	87.1	87	87	88.6	88.3	79.4	78.8	86.7	89.2	92.1	20.6	21.2	13.3	10.8	7.9
141	Russian Federation	0.4	1.2	3.8	3.1	3.1	33.8	36.3	36.9	24.5	21.8	77.7	80.5	84.8	85.2	84.4	6.7	5.6	4.6	4.6	4.5
142	Rwanda	30.1	25.6	26.5	33.2	24.7	0.6	0.6	0.6	0.6	0.6	66.2	67	64.6	61.3	66.1	0.3	0.3	0.3	0.3	0.3
143	Saint Kitts and Nevis	7.2	6.8	6.7	6.2	5.6	0	0	0	0	0	100	100	100	100	100	n/a	n/a	n/a	n/a	n/a
144	Saint Lucia	0.6	0.6	0.5	0.5	0.6	35.2	17.7	14.6	24	25.5	100	100	100	100	100	n/a	n/a	n/a	n/a	n/a
145	Saint Vincent and the Grenadines	1.8	1.7	1.6	1.6	0.3	0	0	0	0	0	100	100	100	100	100	n/a	n/a	n/a	n/a	n/a
146	Samoa	6.1	15.8	13.8	19.1	15.6	0.6	0.6	0.3	0.3	0.2	78.1	79.4	80.1	81.7	87.5	0	0	0	0	0
147	San Marino	0	0	0	0	0	54.8	55.7	54.9	52.7	51.7	100	100	100	100	100	n/a	n/a	n/a	n/a	n/a
148	Sao Tome and Principe	45.3	48.6	64.1	57.8	56.4	0	0	0	0	0	100	100	100	100	100	0	0	0	0	0
149	Saudi Arabia	0	0	0	0	0	0	0	0	0	0	42.2	44.3	42.2	38.9	38	33.4	32.1	33.4	35.4	36.8
150	Senegal	11.7	11.1	12.4	14.1	20.2	0	0	0	0	0	91.3	90.6	91.2	91.3	91.6	8.7	9.4	8.8	8.7	8.4
151	Serbia-Montenegro	0	0.1	0.3	2.2	1.4	92.7	92	92.6	92.4	89.4	100	100	100	100	100	0	0	0	0	0
152	Seychelles	13.7	12.9	12.4	11.8	11.9	0	0	0	0	0	77.8	75.3	75	74.6	75	0	0	0	0	0
153	Sierra Leone	19.3	18.8	22.2	25.4	25.1	0	0	0	0	0	100	100	100	100	100	0	0	0	0	0
154	Singapore	0	0	0	0	0	20.2	17.6	19	23.3	24.5	97.5	97.3	97.4	97.2	97	0	0	0	0	0
155	Slovakia	0	0	0	0	0	96.7	96.6	94.2	94.4	95.1	100	100	100	100	100	0	0	0	0	0
156	Slovenia	0	0	0	0	0	87.8	87.9	87.5	87.5	77.5	48.8	44.4	39.3	38.6	41.7	51.2	55.6	60.7	61.4	58.3
157	Solomon Islands	7	7.7	7.1	16.5	15.9	0	0	0	0	0	47	45.8	47.1	48.3	49.2	0	0	0	0	0
158	Somalia	4.3	5.3	6.1	9	9.3	0	0	0	0	0	100	100	100	100	100	0	0	0	0	0
159	South Africa	0.2	0.2	0.1	0.4	0.4	0	0	0	0	0	19.7	21.9	21.7	21.8	22.1	78.3	76.4	76.7	76.6	72.2
160	Spain	0	0	0	0	0	13.4	11.8	9.4	9.6	9.2	83.9	83.6	83.3	83.1	82.8	12.8	13.1	13.5	13.7	14.1
161	Sri Lanka	3.2	2.8	2.7	2.7	3.1	0	0	0	0	0	95	94.9	95.1	95	95	1	1	1	1.1	1.1
162	Sudan	1.4	2.4	4.1	2.4	2.7	0	0	0	0	0	99.4	99.3	99.4	99.3	99.3	0	0	0	0	0
163	Suriname	9	9.5	17.6	9.8	12.4	32.2	34.9	33.3	28.1	22.8	30.5	33.7	32.7	39.9	57	1.7	1.4	1.3	1	0.7
164	Swaziland	9.3	1.5	5.1	0.9	7.9	0	0	0	0	0	100	100	100	100	100	0	0	0	0	0
165	Sweden	0	0	0	0	0	0	0	0	0	0	100	100	100	100	100	0	0	0	0	0

Annex Table 5 Selected national health accounts indicators: measured levels of expenditure on health, 1997–2001

Figures computed by WHO to assure comparability;[a] they are not necessarily the official statistics of Member States, which may use alternative rigorous methods.

	Member State	Total expenditure on health as % of GDP					General government expenditure on health as % of total expenditure on health					Private expenditure on health as % of total expenditure on health					General government expenditure on health as % of total government expenditure				
		1997	1998	1999	2000	2001	1997	1998	1999	2000	2001	1997	1998	1999	2000	2001	1997	1998	1999	2000	2001
166	Switzerland	10.4	10.6	10.7	10.7	11	55.2	54.9	55.3	55.6	57.1	44.8	45.1	44.7	44.4	42.9	15.3	15.4	11.9	12.5	13.2
167	Syrian Arab Republic	2.5	2.7	2.8	3.1	3.4	59.5	57.5	57.1	51.8	53.1	40.5	42.5	42.9	48.2	46.9	5.2	5.1	5.2	5.3	5.3
168	Tajikistan	5.4	3.6	3.4	3.1	3.4	36	32.4	30.6	29.7	28.9	64	67.6	69.4	70.3	71.1	10.6	7.5	5	5.3	5.5
169	Thailand	3.7	3.9	3.7	3.6	3.7	57.2	61.2	57.6	56.8	57.1	42.8	38.8	42.4	43.2	42.9	10.2	13.3	11.6	11.6	11.6
170	The former Yugoslav Republic of Macedonia	6.1	7.6	6.4	6	6.8	83.9	87.1	85.4	84.5	84.9	16.1	12.9	14.6	15.5	15.1	14.5	19	16.3	15.6	17.4
171	Timor-Leste	9.4	6.4	9.6	7.4	9.8	90.5	85.4	88.6	74	59.5	9.5	14.6	11.4	26	40.5	9	5.8	9	5.8	9
172	Togo	3	3.5	4	3	2.8	50.2	59.6	62.8	48.7	48.6	49.8	40.4	37.2	51.3	51.4	8.3	9.7	12.8	7.9	9.3
173	Tonga	5.5	5.5	5.4	5.3	5.5	59.8	61.2	60.7	60.5	61.6	40.2	38.8	39.3	39.5	38.4	7.8	9.6	12.7	11.6	10.9
174	Trinidad and Tobago	4.5	4.8	4.5	3.9	4	43	46.5	46.5	45.9	43.3	57	53.5	53.5	54.1	56.7	6.6	6.7	6.7	6.7	6.4
175	Tunisia	6.4	6.3	6.3	6.2	6.4	77.7	76.7	75.9	74.3	75.7	22.3	23.3	24.1	25.7	24.3	15.5	15	14.9	14.2	15.1
176	Turkey	4.2	4.8	4.9	5	5	71.6	71.9	71.1	71.1	71	28.4	28.1	28.9	28.9	29	10.8	11.5	9.1	9	9.1
177	Turkmenistan	4.7	5	5	4	4.1	75.6	70.3	68	74.5	73.3	24.4	29.7	32	25.5	26.7	12	14.4	17.5	11.5	18.2
178	Tuvalu	5.3	5.2	5.4	5.5	5.4	59.1	59.3	57.3	53.5	53.4	40.9	40.7	42.7	46.5	46.6	5.4	3.7	3.6	3.3	2.9
179	Uganda	3.9	4	4.1	5.6	5.9	29.1	38	40.9	56.1	57.5	70.9	62	59.1	43.9	42.5	6.5	8.1	8.4	16.4	16.4
180	Ukraine	5.4	5	4.3	4.2	4.3	75	71.7	68.3	68.2	67.8	25	28.3	31.7	31.8	32.2	9.3	8	8.3	7.6	7.6
181	United Arab Emirates	3.6	4	3.7	3.5	3.5	76.7	77	75.8	75.9	75.8	23.3	23	24.2	24.1	24.2	28.9	28.8	27.9	31.5	32.3
182	United Kingdom	6.8	6.9	7.2	7.3	7.6	80.1	80.2	80.5	80.9	82.2	19.9	19.8	19.5	19.1	17.8	13.4	13.9	14.8	15	15.4
183	United Republic of Tanzania	4.1	4.4	4.3	4.4	4.4	45.9	47.1	43.4	47.1	46.7	54.1	52.9	56.6	52.9	53.3	14.4	13.1	12.4	12.1	12.1
184	United States of America	13	13	13	13.1	13.9	45.3	44.5	44.2	44.2	44.4	54.7	55.5	55.8	55.8	55.6	16.8	16.9	16.9	17.2	17.6
185	Uruguay	10	10.2	10.7	10.9	10.9	40.8	41	48.2	46.6	46.3	59.2	59	51.8	53.4	53.7	12.1	12.5	14.9	14.9	14.9
186	Uzbekistan	4.2	3.9	3.6	3.7	3.6	72.7	75.1	74	74.9	74.5	27.3	24.9	26	25.1	25.5	9.3	8.8	8.6	9.6	9.2
187	Vanuatu	3.4	3.5	3.7	3.8	3.8	65.5	65.4	63.6	60.9	59.2	34.5	34.6	36.4	39.1	40.8	10.2	8.7	10.3	10.1	9.7
188	Venezuela, Bolivarian Republic of	5.4	5.4	5.6	5.9	6	57.1	54.4	53.9	57.1	62.1	42.9	45.6	46.1	42.9	37.9	12.5	12.4	13.6	13.8	14.7
189	Viet Nam	4.4	4.9	4.9	5.2	5.1	31.5	32.7	32.7	28.5	28.5	68.5	67.3	67.3	71.5	71.5	5.6	7.1	6.7	6.1	6.1
190	Yemen	3.8	4.4	4	4	4.5	30.4	39.5	32.5	34.6	34.1	69.6	60.5	67.5	65.4	65.9	3.5	4.8	4.8	3.9	4
191	Zambia	6	6	5.7	5.5	5.7	55.1	56.9	54.8	52.5	53.1	44.9	43.1	45.2	47.5	46.9	13.1	12.5	13.7	13.6	13.5
192	Zimbabwe	9.3	11.4	7.9	7.4	6.2	59.1	55.9	48.9	50.7	45.3	40.9	44.1	51.1	49.3	54.7	15.4	12.2	10	7.1	8

[a] See explanatory notes for sources and methods.

n/a Used when the information accessed indicates that a cell should have an entry but no estimates could be accessed.

0 Used when no evidence of the schemes to which the cell relates exist. Some estimates yielding a ratio inferior to 0.04% are shown as 0.

	Member State	External resources for health as % of total expenditure on health					Social security expenditure on health as % of general govenment expenditure on health					Out-of-pocket expenditure as % of private expenditure on health					Private prepaid plans as % of private expenditure on health				
		1997	1998	1999	2000	2001	1997	1998	1999	2000	2001	1997	1998	1999	2000	2001	1997	1998	1999	2000	2001
166	Switzerland	0	0	0	0	0	71.6	72.3	72.1	72.6	70.4	72	72.6	74.5	74.1	73.9	25.7	25.2	23.3	23.6	23.8
167	Syrian Arab Republic	0.6	0.5	0.3	0.2	0.5	0	0	0	0	0	66.5	67.9	72.4	61.9	57.3	0	0	0	0	0
168	Tajikistan	4.1	6.2	3.1	12.4	5.9	0	0	0	0	0	100	100	100	100	100	0	0	0	0	0
169	Thailand	0.3	0.4	0.5	0.5	0.1	30.2	25.8	26.9	27	26.8	86.2	84.9	84.9	85	85	8.6	9.6	9.6	9.6	9.6
170	The former Yugoslav Republic of Macedonia	2.6	2.6	2.6	3.1	3.5	96.3	96.8	94.8	91.9	87.5	100	100	100	100	100	0	0	0	0	0
171	Timor-Leste	41.8	66.7	87.2	64.6	53.8	0.9	1.2	n/a	n/a	n/a	93	88.6	75.8	43.1	20.8	0	0	0	0	0
172	Togo	8.1	9.8	5.3	31.2	8.1	0	0	0	0	0	100	100	100	100	100	n/a	n/a	n/a	n/a	n/a
173	Tonga	6.3	5.9	8.8	10.2	20.7	0	0	0	0	0	100	100	100	100	100	0	0	0	0	0
174	Trinidad and Tobago	5.2	4.6	4.4	4.2	3.8	0	0	0	0	0	86.9	87.1	86.4	85.7	86.5	6.2	6.2	6.7	7.6	7.1
175	Tunisia	0.6	0.6	0.6	0.6	0.6	45.3	52.7	54.9	57.3	53.4	77.2	76	77.1	78	77.6	22.8	24	22.9	22	22.4
176	Turkey	0.4	0.4	0.1	0.1	0	38.8	43.8	28.4	28.4	28.6	99.6	99.6	99.8	99.9	98.8	0.2	0.2	0.2	0.1	1.2
177	Turkmenistan	2.1	2.6	1.4	0.9	0.6	8.4	16.2	23.5	26.4	26.8	71.4	76.6	78.1	72.6	73.7	28.6	23.4	21.9	27.4	26.3
178	Tuvalu	6.9	7.1	6.4	6.4	29.4	0	0	0	0	0	100	100	100	100	100	0	0	0	0	0
179	Uganda	24.4	41.7	22.9	41.2	24.8	0	0	0	0	0	54	54	55.4	55.6	53.4	0.5	0.5	0.5	0.5	0.5
180	Ukraine	0.6	0.4	0.3	0.7	0.7	0	0	0	0	0	100	100	100	100	100	0	0	0	0	0
181	United Arab Emirates	0	0	0	0	0	0	0	0	0	0	69.4	69.5	67	66	65.6	16.4	16.9	19	19.1	19.1
182	United Kingdom	0	0	0	0	0	0	0	0	0	0	53.5	55.1	54.7	55	55.3	17	17.2	16.7	16.7	17.2
183	United Republic of Tanzania	16	22	35.3	30	29.5	0	0	0	0	0	87	87.5	83.5	83	83.1	0	0	4.5	4.4	4.4
184	United States of America	0	0	0	0	0	32.1	33.3	33.3	33.9	32.9	27.6	28	27.6	27.2	26.5	61.2	61	61.7	62.8	64.1
185	Uruguay	0.6	0.6	0.1	0.5	0.8	45.6	46.8	37.6	34.7	35.8	33.5	32.9	33.2	31.2	30.4	66.5	67.1	66.8	68.8	69.6
186	Uzbekistan	1	1.3	1.5	0.9	1.7	0	0	0	0	0	100	100	100	100	100	0	0	0	0	0
187	Vanuatu	20	30.4	28.7	28.5	8.4	0	0	0	0	0	100	100	100	100	100	0	0	0	0	0
188	Venezuela, Bolivarian Republic of	1.3	1.2	1	0.4	0.1	20.9	18.6	25	24.7	20.2	78.6	77.9	79.9	73.8	95.4	4.6	4.8	4.4	4	4.6
189	Viet Nam	5.6	2.8	3.4	2.7	2.6	13	11.5	9.5	10.9	10.9	93.5	89.7	86.5	87.7	87.6	0	3.4	3.7	4.2	4.2
190	Yemen	6.2	5.2	5.1	4.1	3.7	0	0	0	0	0	87.4	87.9	88.2	87.8	88.7	0	0	0	0	0
191	Zambia	23.5	26.1	40.1	33.5	48.7	0	0	0	0	0	70.9	74.1	70.7	71.1	71.8	0	0	0	0	0
192	Zimbabwe	2.3	17.2	13	12.5	7.8	0	0	0	0	0	67	75.2	44.9	48	52.2	21	16.4	39.6	39.2	34.8

Annex Table 6 Selected national health accounts indicators: measured levels of per capita expenditure on health, 1997–2001

Figures computed by WHO to assure comparability;[a] they are not necessarily the official statistics of Member States, which may use alternative rigorous methods.

	Member State	Per capita total expenditure on health at average exchange rate (US$)					Per capita total expenditure on health at international dollar rate					Per capita government expenditure on health at average exchange rate (US$)					Per capita government expenditure on health at international dollar rate				
		1997	1998	1999	2000	2001	1997	1998	1999	2000	2001	1997	1998	1999	2000	2001	1997	1998	1999	2000	2001
1	Afghanistan	n/a	n/a	n/a	9	8	34	35	38	40	34	n/a	n/a	n/a	5	4	17	19	20	22	18
2	Albania	28	34	43	46	48	108	108	125	144	150	17	21	27	30	31	66	67	78	92	97
3	Algeria	57	59	59	68	73	122	133	138	151	169	41	42	41	48	55	87	94	96	106	127
4	Andorra	1328	1670	1285	1200	1233	1601	2021	1610	1723	1821	950	1313	920	841	875	1145	1589	1152	1208	1292
5	Angola	26	19	17	26	31	56	51	48	55	70	12	8	7	14	19	25	20	21	30	44
6	Antigua and Barbuda	448	464	485	509	531	484	496	526	581	614	278	290	297	305	323	300	310	322	348	374
7	Argentina	668	680	700	683	679	1014	1065	1140	1099	1130	371	376	394	377	363	563	588	641	607	604
8	Armenia	36	42	46	49	54	171	190	224	246	273	13	16	19	20	22	60	70	92	99	112
9	Australia	1909	1709	1870	1808	1741	1978	2093	2230	2363	2532	1293	1165	1293	1246	1182	1341	1427	1542	1629	1718
10	Austria	2027	2100	2086	1873	1866	1881	1972	2070	2236	2259	1438	1500	1461	1305	1293	1334	1409	1450	1559	1566
11	Azerbaijan	11	13	11	11	11	44	50	46	46	48	8	9	8	8	8	32	37	32	31	32
12	Bahamas	701	754	807	863	864	829	922	1057	1117	1220	390	434	463	490	492	461	531	606	635	695
13	Bahrain	484	480	479	484	500	702	715	670	568	664	341	335	332	334	345	495	498	464	393	458
14	Bangladesh	10	10	11	13	12	40	41	47	56	58	3	4	4	6	5	13	15	17	26	26
15	Barbados	495	531	569	603	613	775	783	839	881	940	323	348	374	397	406	505	514	551	581	623
16	Belarus	82	67	63	56	68	375	391	415	424	464	71	58	54	48	59	327	337	355	362	402
17	Belgium	2016	2059	2095	1916	1983	1988	1969	2105	2272	2481	1441	1481	1512	1382	1421	1422	1417	1519	1639	1778
18	Belize	130	133	149	156	167	228	236	257	257	278	66	69	72	75	75	116	122	125	123	125
19	Benin	14	15	15	15	16	28	29	31	35	39	5	5	6	7	8	9	11	12	15	18
20	Bhutan	8	8	8	9	9	48	52	52	61	64	7	7	7	8	8	43	47	47	55	58
21	Bolivia	48	53	53	52	49	104	114	120	122	125	31	35	35	35	33	66	75	79	81	83
22	Bosnia and Herzegovina	69	89	94	87	85	192	237	241	259	268	36	36	37	34	31	100	95	95	103	99
23	Botswana	169	158	164	173	190	260	260	294	309	381	100	95	100	107	126	153	155	178	192	252
24	Brazil	362	348	246	265	222	528	526	560	556	573	157	153	105	108	92	229	231	240	227	238
25	Brunei Darussalam	429	463	484	479	453	525	570	607	617	638	340	376	384	383	359	416	464	482	493	507
26	Bulgaria	58	60	80	75	81	227	200	272	283	303	48	47	67	62	67	188	159	227	233	248
27	Burkina Faso	7	8	8	6	6	25	26	30	29	27	5	5	5	4	4	17	17	20	18	16
28	Burundi	5	5	4	4	4	15	17	16	18	19	2	3	2	2	2	8	9	9	10	11
29	Cambodia	30	25	28	30	30	146	142	152	174	184	3	3	3	4	4	15	14	15	25	27
30	Cameroon	23	23	19	19	20	45	38	36	39	42	5	4	4	7	8	9	7	8	13	16
31	Canada	1864	1835	1949	2102	2163	2187	2288	2433	2580	2792	1305	1297	1372	1490	1533	1532	1617	1713	1828	1978
32	Cape Verde	38	45	41	38	46	88	106	99	109	134	26	33	29	27	34	60	77	69	76	100
33	Central African Republic	10	12	12	12	12	41	47	50	55	58	4	5	6	6	6	16	21	24	27	30
34	Chad	6	5	5	5	5	17	14	16	19	17	5	4	4	4	4	13	10	12	15	13
35	Chile	371	369	331	336	303	643	699	686	681	792	140	146	135	143	133	243	277	280	290	348
36	China	33	36	40	45	49	135	155	176	200	224	13	14	15	17	18	54	60	67	73	83
37	Colombia	205	140	133	108	105	497	373	395	350	356	98	84	82	73	69	237	225	245	236	234
38	Comoros	10	10	10	9	9	28	27	27	26	29	6	6	6	5	6	17	16	16	16	17
39	Congo	23	19	19	18	18	33	34	28	20	22	16	14	13	13	12	23	26	20	15	14
40	Cook Islands	258	216	214	196	198	430	452	442	444	598	188	155	139	126	134	312	325	288	286	404
41	Costa Rica	236	254	268	280	293	445	477	496	533	562	167	171	184	192	201	315	323	339	365	385
42	Côte d'Ivoire	48	54	51	42	41	107	117	119	123	127	9	10	10	6	7	20	22	24	19	20
43	Croatia	373	429	402	388	394	569	637	651	715	726	300	351	332	323	322	458	521	538	595	593
44	Cuba	137	143	163	175	185	166	170	188	193	229	114	121	139	150	160	139	144	161	166	198
45	Cyprus	909	991	862	909	932	938	948	917	905	941	457	516	436	443	445	472	493	464	441	449
46	Czech Republic	364	392	380	358	407	930	944	972	1031	1129	334	360	347	327	372	853	867	889	942	1031
47	Democratic People's Republic of Korea	10	16	19	21	22	27	47	54	41	44	7	12	14	15	16	19	36	40	30	32
48	Democratic Republic of Congo	4	4	8	10	5	13	12	11	11	12	2	2	4	5	2	6	5	5	5	5
49	Denmark	2629	2725	2769	2474	2545	2099	2238	2344	2398	2503	2163	2234	2276	2042	2097	1727	1835	1927	1979	2063
50	Djibouti	60	59	58	58	58	90	89	88	89	90	35	34	34	34	34	52	52	51	52	53
51	Dominica	190	193	214	200	203	274	278	305	291	312	143	144	159	143	145	205	208	227	208	222
52	Dominican Republic	111	114	121	145	153	262	279	298	345	353	35	36	39	51	55	84	88	96	122	127
53	Ecuador	88	85	50	52	76	168	167	131	149	177	47	43	28	29	38	89	84	73	82	89
54	Egypt	47	48	52	52	46	121	125	134	139	153	21	22	24	24	22	56	57	62	64	75
55	El Salvador	153	165	163	169	174	332	347	348	364	376	59	70	71	76	81	128	148	151	164	175

	Member State	Per capita total expenditure on health at average exchange rate (US$)					Per capita total expenditure on health at international dollar rate					Per capita government expenditure on health at average exchange rate (US$)					Per capita government expenditure on health at international dollar rate				
		1997	1998	1999	2000	2001	1997	1998	1999	2000	2001	1997	1998	1999	2000	2001	1997	1998	1999	2000	2001
56	Equatorial Guinea	37	44	42	56	76	59	99	73	65	106	23	27	26	35	46	36	61	45	40	64
57	Eritrea	9	10	11	9	10	25	29	31	32	36	6	7	7	6	6	17	19	21	22	23
58	Estonia	182	223	244	222	226	430	494	548	551	562	158	193	196	170	176	373	427	440	423	438
59	Ethiopia	4	4	3	3	3	12	11	11	11	14	1	1	1	1	1	5	4	4	4	6
60	Fiji	106	82	85	80	79	187	189	184	213	224	71	54	56	52	53	125	124	120	139	150
61	Finland	1737	1734	1713	1550	1631	1543	1528	1614	1696	1845	1322	1323	1290	1164	1233	1174	1165	1215	1274	1395
62	France	2261	2307	2285	2067	2109	2028	2079	2204	2382	2567	1723	1754	1738	1568	1603	1546	1581	1676	1806	1951
63	Gabon	131	137	131	130	127	178	228	204	176	197	86	91	85	65	61	116	152	132	88	94
64	Gambia	22	24	23	20	19	62	74	73	73	78	10	10	11	9	9	29	32	34	34	39
65	Georgia	19	16	13	20	22	71	60	65	95	108	8	7	5	7	8	28	27	25	32	41
66	Germany	2753	2773	2731	2408	2412	2458	2515	2621	2766	2820	2073	2075	2043	1807	1807	1851	1882	1961	2075	2113
67	Ghana	15	17	17	11	12	44	49	49	52	60	7	9	9	6	7	21	26	27	29	36
68	Greece	1092	1087	1149	1015	1001	1326	1407	1523	1553	1522	577	566	614	570	560	701	732	813	872	852
69	Grenada	179	205	225	245	262	298	331	372	416	445	118	135	157	171	188	197	218	259	291	320
70	Guatemala	64	78	78	79	86	140	167	186	190	199	24	37	38	38	41	52	79	90	90	96
71	Guinea	18	15	16	13	13	54	52	58	57	61	10	8	9	7	7	31	27	32	30	33
72	Guinea-Bissau	12	9	10	10	8	44	31	36	41	37	5	4	5	5	5	19	14	18	23	20
73	Guyana	48	48	44	48	50	176	182	184	196	215	40	40	37	40	40	147	152	154	162	171
74	Haiti	20	23	24	22	22	51	54	53	56	56	10	11	12	11	12	26	27	27	28	30
75	Honduras	42	48	48	54	59	126	134	130	145	153	22	26	25	29	31	67	72	67	78	81
76	Hungary	309	315	320	305	345	684	731	771	813	914	251	251	250	231	258	556	581	602	614	686
77	Iceland	2190	2509	2877	2759	2441	2003	2226	2563	2607	2643	1820	2084	2417	2309	2025	1665	1848	2154	2182	2192
78	India	23	22	23	23	24	64	65	71	74	80	4	4	4	4	4	10	12	13	13	14
79	Indonesia	26	11	17	20	16	82	72	76	85	77	6	3	5	5	4	19	20	21	20	19
80	Iran, Islamic Republic of	149	172	243	310	350	326	342	382	390	422	67	76	102	129	152	147	150	160	162	183
81	Iraq	146	170	199	214	225	63	70	80	91	97	48	54	62	67	72	21	22	25	28	31
82	Ireland	1404	1451	1591	1586	1714	1417	1439	1625	1797	1935	1047	1110	1159	1162	1303	1057	1101	1183	1317	1470
83	Israel	1551	1505	1492	1612	1641	1656	1674	1725	1748	1839	1148	1084	1059	1124	1135	1226	1206	1224	1219	1272
84	Italy	1570	1606	1605	1518	1584	1682	1786	1876	2047	2204	1133	1154	1155	1114	1193	1214	1283	1351	1502	1660
85	Jamaica	177	179	169	173	191	227	226	215	224	253	100	107	86	82	80	128	135	110	105	106
86	Japan	2337	2216	2634	2890	2627	1734	1730	1852	2002	2131	1803	1715	2056	2245	2046	1338	1339	1445	1555	1660
87	Jordan	129	135	143	154	163	323	324	350	383	412	70	77	73	72	76	176	185	178	178	194
88	Kazakhstan	44	48	37	39	44	150	163	174	186	204	32	34	24	24	27	109	114	110	117	123
89	Kenya	29	33	28	30	29	110	116	111	124	114	6	8	5	7	6	24	28	21	30	24
90	Kiribati	53	47	49	45	40	141	141	144	148	143	53	46	48	44	40	139	140	143	146	141
91	Kuwait	596	562	536	553	537	638	750	617	540	612	474	443	422	435	423	507	591	486	425	482
92	Kyrgyzstan	15	16	11	12	12	93	109	107	108	108	10	10	6	6	6	63	65	58	52	53
93	Lao People's Democratic Republic	10	6	8	9	10	39	33	43	45	51	6	3	4	5	6	24	16	21	24	29
94	Latvia	157	171	190	191	210	385	412	439	446	509	89	104	113	107	110	219	250	262	249	267
95	Lebanon	532	594	587	607	500	642	701	719	794	673	165	162	157	178	141	200	191	192	232	189
96	Lesotho	31	30	31	29	23	94	98	105	109	101	24	23	25	24	18	71	77	85	88	80
97	Liberia	1	1	2	2	1	91	99	110	114	127	1	1	1	1	1	63	73	84	87	97
98	Libyan Arab Jamahiriya	250	249	177	175	143	274	301	282	233	239	120	124	87	90	80	131	149	138	120	134
99	Lithuania	165	197	190	200	206	401	454	431	454	478	126	148	140	141	146	306	341	317	321	337
100	Luxembourg	2496	2611	2756	2411	2600	2238	2402	2631	2659	2905	2274	2374	2463	2152	2336	2039	2184	2352	2374	2611
101	Madagascar	4	7	6	6	6	16	24	23	23	20	3	4	4	4	4	12	15	13	15	13
102	Malawi	21	15	14	12	13	41	41	42	42	39	8	5	5	4	4	15	14	16	15	14
103	Malaysia	129	99	109	129	143	237	237	257	297	345	69	51	58	69	77	127	122	136	158	185
104	Maldives	83	85	95	104	98	180	190	219	272	263	68	70	78	87	82	147	155	181	228	220
105	Mali	10	11	10	10	11	25	25	25	32	30	5	4	3	4	4	11	9	8	13	12
106	Malta	738	784	760	807	808	739	759	782	804	813	501	543	513	553	554	502	526	528	551	557
107	Marshall Islands	186	187	182	188	190	332	331	327	340	343	131	124	118	122	123	234	220	213	221	222
108	Mauritania	15	14	13	13	12	38	40	43	45	45	11	10	9	9	9	28	29	31	33	33
109	Mauritius	109	114	113	127	128	227	256	259	288	323	67	72	70	74	76	139	160	160	169	192
110	Mexico	231	244	277	327	370	418	446	471	501	544	105	114	130	150	164	190	208	221	229	241

Annex Table 6 Selected national health accounts indicators: measured levels of per capita expenditure on health, 1997–2001

Figures computed by WHO to assure comparability;[a] they are not necessarily the official statistics of Member States, which may use alternative rigorous methods.

	Member State	Per capita total expenditure on health at average exchange rate (US$)					Per capita total expenditure on health at international dollar rate					Per capita government expenditure on health at average exchange rate (US$)					Per capita government expenditure on health at international dollar rate				
		1997	1998	1999	2000	2001	1997	1998	1999	2000	2001	1997	1998	1999	2000	2001	1997	1998	1999	2000	2001
111	Micronesia, Federated States of	170	167	169	169	172	315	304	302	296	319	125	121	121	121	124	232	221	217	212	230
112	Monaco	1689	1783	1812	1610	1653	1516	1608	1751	1863	2016	924	956	955	878	927	829	862	923	1016	1131
113	Mongolia	22	24	21	23	25	84	106	110	118	122	14	16	14	16	18	52	69	73	83	88
114	Morocco	52	56	54	54	59	147	160	159	171	199	13	16	16	18	23	38	45	46	58	78
115	Mozambique	10	11	11	12	11	29	32	35	40	47	6	7	7	8	8	18	20	23	27	32
116	Myanmar	81	109	147	162	197	21	21	22	23	26	12	12	17	28	35	3	2	3	4	5
117	Namibia	143	128	127	126	110	308	307	323	330	330	101	92	93	87	76	219	221	236	227	229
118	Nauru	719	640	705	643	588	981	987	941	921	1015	640	570	628	571	521	874	878	839	819	900
119	Nepal	12	11	12	12	12	58	60	59	61	63	4	4	3	4	3	18	20	18	18	19
120	Netherlands	1968	2151	2191	2012	2138	1951	2164	2305	2358	2612	1335	1385	1386	1275	1354	1323	1393	1458	1495	1654
121	New Zealand	1301	1125	1169	1054	1073	1357	1440	1534	1611	1724	1005	867	911	822	823	1049	1109	1195	1257	1323
122	Nicaragua	45	44	44	55	60	117	110	113	147	158	24	27	24	29	29	63	66	61	77	77
123	Niger	6	7	6	6	6	21	22	22	21	22	3	3	3	2	2	9	9	9	9	9
124	Nigeria	35	37	10	12	15	23	26	26	26	31	4	6	2	2	3	3	4	4	4	7
125	Niue	344	330	335	290	289	945	910	990	1068	1041	334	321	325	281	280	917	883	961	1036	1010
126	Norway	2797	2867	3025	2817	2981	2193	2438	2550	2755	2920	2357	2428	2576	2400	2550	1848	2065	2172	2347	2497
127	Oman	229	219	221	230	225	348	392	357	316	343	187	180	182	187	181	285	322	294	256	277
128	Pakistan	19	19	18	18	16	73	77	80	85	85	5	6	5	4	4	20	22	20	21	21
129	Palau	498	502	447	454	426	695	789	823	835	886	456	466	408	416	392	636	733	753	766	816
130	Panama	231	244	252	260	258	398	411	434	452	458	158	171	176	180	178	272	289	303	313	316
131	Papua New Guinea	32	29	28	27	24	107	121	144	145	144	28	26	25	24	21	95	110	129	130	128
132	Paraguay	143	121	115	112	97	320	305	326	323	332	47	45	45	43	37	105	114	129	124	127
133	Peru	106	105	99	97	97	207	216	231	228	231	54	57	55	54	53	107	118	129	126	127
134	Philippines	41	31	36	34	30	168	162	165	169	169	18	14	16	16	14	73	70	74	81	77
135	Poland	228	264	249	245	289	461	543	558	572	629	164	173	177	171	208	332	355	397	400	452
136	Portugal	903	956	986	938	982	1339	1370	1457	1512	1618	586	626	666	642	677	868	898	985	1036	1116
137	Qatar	813	819	824	860	885	842	1006	874	720	782	624	630	626	638	650	647	773	665	534	574
138	Republic of Korea	520	352	484	577	532	657	628	762	893	948	213	163	209	256	236	270	290	329	396	421
139	Republic of Moldova	37	28	15	16	18	154	125	92	94	100	27	17	8	9	10	112	76	50	53	56
140	Romania	79	124	108	109	117	320	409	424	428	460	53	92	84	86	93	214	303	330	338	365
141	Russian Federation	167	112	71	95	115	390	382	378	420	454	122	77	46	66	78	284	263	245	293	310
142	Rwanda	16	15	14	13	11	39	39	41	43	44	8	8	8	7	6	19	20	22	23	24
143	Saint Kitts and Nevis	304	323	335	364	393	464	495	507	535	576	202	216	222	241	260	307	330	336	355	382
144	Saint Lucia	169	187	192	195	199	240	257	254	263	272	105	123	125	127	129	150	169	166	171	176
145	Saint Vincent and the Grenadines	155	161	170	170	178	295	302	324	341	358	99	101	106	111	113	188	189	203	222	227
146	Samoa	79	76	84	80	74	167	185	210	218	199	58	56	62	61	61	123	136	156	168	164
147	San Marino	1188	1252	1286	1196	1222	1275	1391	1511	1610	1711	892	944	974	922	953	957	1049	1145	1240	1334
148	Sao Tome and Principe	10	8	8	7	7	26	25	21	22	22	6	6	5	5	5	17	17	14	15	15
149	Saudi Arabia	432	368	340	376	375	680	680	583	565	591	334	281	251	280	280	526	519	430	421	441
150	Senegal	25	25	24	22	22	53	53	56	58	63	14	14	14	12	13	29	30	31	33	37
151	Serbia-Montenegro	198	149	189	89	103	621	542	613	528	616	147	106	131	69	82	460	386	426	409	488
152	Seychelles	490	500	491	444	450	732	752	746	733	770	355	347	338	295	307	529	522	513	487	525
153	Sierra Leone	7	5	6	6	7	23	21	23	25	26	3	2	3	4	4	11	9	13	15	16
154	Singapore	936	902	851	826	816	834	926	947	925	993	365	375	327	291	274	325	385	363	326	333
155	Slovakia	230	235	218	208	216	608	636	664	642	681	211	215	196	186	192	558	583	595	574	608
156	Slovenia	712	813	829	765	821	1097	1223	1299	1421	1545	564	616	626	582	615	868	927	981	1080	1157
157	Solomon Islands	45	40	42	39	40	100	106	113	141	133	41	37	39	37	37	92	99	106	132	124
158	Somalia	5	6	7	6	6	14	15	15	15	n/a	2	3	3	3	3	7	7	7	7	n/a
159	South Africa	315	270	264	253	222	622	604	623	633	652	145	114	113	106	92	287	256	265	265	270
160	Spain	1067	1115	1140	1048	1088	1273	1347	1428	1505	1607	773	805	822	751	778	922	973	1030	1078	1148
161	Sri Lanka	27	29	30	32	30	91	102	112	121	122	13	15	15	16	15	45	52	55	60	60
162	Sudan	13	14	12	14	14	31	39	38	41	39	2	3	3	4	3	6	9	9	12	7
163	Suriname	207	194	104	186	153	371	404	402	407	398	108	120	62	118	92	194	249	239	258	240
164	Swaziland	45	43	43	45	41	137	146	152	163	167	32	30	29	31	28	98	103	103	114	115
165	Sweden	2300	2336	2395	2268	2150	1855	1903	2053	2195	2270	1975	2005	2053	1929	1832	1592	1633	1760	1866	1935
166	Switzerland	3762	3909	3881	3574	3774	2841	2952	3080	3160	3322	2075	2145	2148	1986	2156	1567	1619	1704	1758	1897
167	Syrian Arab Republic	27	29	31	36	41	194	217	233	251	266	16	17	18	19	22	116	125	133	130	141
168	Tajikistan	8	8	6	5	6	52	36	36	36	43	3	3	2	1	2	19	12	11	11	12
169	Thailand	95	73	75	73	69	247	234	233	241	254	54	45	43	41	39	141	143	134	137	145
170	The former Yugoslav Republic of Macedonia	114	135	117	106	115	263	340	303	302	331	96	118	100	90	98	221	296	259	255	281
171	Timor-Leste	46	32	30	28	42	n/a	n/a	n/a	n/a	n/a	41	27	27	20	25	n/a	n/a	n/a	n/a	n/a
172	Togo	11	12	13	8	8	40	51	55	45	45	5	7	8	4	4	20	30	34	22	22
173	Tonga	97	87	87	81	73	192	194	203	209	223	58	53	53	49	45	115	119	123	126	138
174	Trinidad and Tobago	203	229	238	248	279	332	378	379	360	388	87	106	111	114	121	143	175	176	165	168
175	Tunisia	132	133	139	126	134	360	367	398	417	463	102	102	106	94	101	280	282	302	310	350
176	Turkey	125	149	137	148	109	272	301	291	311	294	90	107	98	105	77	195	217	207	222	209
177	Turkmenistan	28	34	42	42	57	170	195	226	222	245	21	24	29	31	42	129	137	153	166	180
178	Tuvalu	71	68	75	74	66	495	558	566	553	673	42	41	43	39	35	293	330	324	296	359
179	Uganda	12	11	11	14	14	32	32	37	52	57	3	4	5	8	8	9	12	15	29	33
180	Ukraine	53	42	27	27	33	179	166	145	156	176	40	30	19	18	22	134	119	99	107	120
181	United Arab Emirates	703	724	729	821	849	727	754	710	781	921	539	557	552	623	643	558	580	538	593	698
182	United Kingdom	1563	1683	1792	1783	1835	1516	1573	1704	1827	1989	1253	1349	1442	1444	1508	1214	1261	1371	1479	1634
183	United Republic of Tanzania	10	11	11	11	12	21	23	23	25	26	4	5	5	5	5	9	11	10	12	12
184	United States of America	3939	4095	4287	4540	4887	3939	4095	4287	4540	4887	1784	1824	1895	2005	2168	1784	1824	1895	2005	2168
185	Uruguay	662	696	675	653	603	894	965	988	986	971	270	286	326	304	279	364	396	477	459	450
186	Uzbekistan	27	24	25	21	17	89	85	82	88	91	19	18	19	15	12	65	64	60	66	68
187	Vanuatu	47	43	44	44	42	102	105	109	109	107	31	28	28	27	25	67	69	70	66	63
188	Venezuela, Bolivarian Republic of	210	221	244	296	307	338	333	324	353	386	120	120	132	169	191	193	181	175	201	240
189	Viet Nam	16	18	18	21	21	92	108	113	128	134	5	6	6	6	6	29	35	37	36	38
190	Yemen	16	16	17	19	20	52	63	58	59	69	5	6	5	7	7	16	25	19	21	24
191	Zambia	24	20	19	18	19	51	48	47	47	52	13	12	11	10	10	28	28	26	25	27
192	Zimbabwe	66	59	35	42	45	221	275	192	182	142	39	33	17	22	20	131	154	94	92	64

[a] See explanatory notes for sources and methods.

n/a Used when the information accessed indicates that a cell should have an entry but no estimates could be accessed.

0 Used when no evidence of the schemes to which the cell relates exist. Some estimates yielding a ratio inferior to 0.04% are shown as 0.

List of Member States by WHO region and mortality stratum

To aid in cause-of-death and burden-of-disease analyses, the 192 Member States of the World Health Organization have been divided into five mortality strata on the basis of their levels of mortality in children under five years of age (5q0) and in males 15–59 years old (45q15). This classification was carried out using population estimates for 1999 (using United Nations Population Division data) and estimates of 5q0 and 45q15 based on WHO analyses of mortality rates for 1999.

Quintiles of the distribution of 5q0 (both sexes combined) were used to define some countries as ***very low child mortality*** (1st quintile), some as ***low child mortality*** (2nd and 3rd quintiles) and others as ***high child mortality*** (4th and 5th quintiles). Adult mortality 45q15 was regressed on 5q0 and the regression line used to divide countries with high child mortality into ***high adult mortality*** (stratum D) and ***very high adult mortality*** (stratum E). Stratum E includes the countries in sub-Saharan Africa where HIV/AIDS has had a very substantial impact.

The following table summarizes the five mortality strata. When these mortality strata are applied to the six WHO regions, they produce 14 subregions, which are used in this report and in the Annex Tables to present results.

Definitions of mortality strata used to define subregions

Mortality stratum	Child mortality	Adult mortality
A	Very low	Low
B	Low	Low
C	Low	High
D	High	High
E	High	Very high

The WHO Member States in each region are grouped by subregion as listed below. This classification has no official status and is for analytical purposes only.

The total number of WHO Member States has risen to 192, with the addition in *The World Health Report 2003* of Timor-Leste, which is classified in the high-mortality developing region of Sear-D. In 2003, the Fifty-sixth World Health Assembly endorsed the reassignment of Cyprus to the European Region from the Eastern Mediterranean Region.

Three major groupings of countries are used in Chapter 1, defined by geography, state of economic and demographic development, and mortality patterns. These are developed countries (Amr-A, Eur-A, Eur-B, Eur-C and Wpr-A), high-mortality developing countries (Afr-D, Afr-E, Amr-D, Emr-D and Sear-D), and low-mortality developing countries (Amr-B, Emr-B, Sear-B and Wpr-B).

WHO Member States, by region and mortality stratum

Region and mortality stratum	Description	Broad grouping	Member States
Africa Afr-D	Africa with high child and high adult mortality	High-mortality developing	Algeria, Angola, Benin, Burkina Faso, Cameroon, Cape Verde, Chad, Comoros, Equatorial Guinea, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Madagascar, Mali, Mauritania, Mauritius, Niger, Nigeria, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Togo
Afr-E	Africa with high child and very high adult mortality	High-mortality developing	Botswana, Burundi, Central African Republic, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Eritrea, Ethiopia, Kenya, Lesotho, Malawi, Mozambique, Namibia, Rwanda, South Africa, Swaziland, Uganda, United Republic of Tanzania, Zambia, Zimbabwe
Americas Amr-A	Americas with very low child and very low adult mortality	Developed	Canada, Cuba, United States of America
Amr-B	Americas with low child and low adult mortality	Low-mortality developing	Antigua and Barbuda, Argentina, Bahamas, Barbados, Belize, Brazil, Chile, Colombia, Costa Rica, Dominica, Dominican Republic, El Salvador, Grenada, Guyana, Honduras, Jamaica, Mexico, Panama, Paraguay, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago, Uruguay, Venezuela (Bolivarian Republic of)
Amr-D	Americas with high child and high adult mortality	High-mortality developing	Bolivia, Ecuador, Guatemala, Haiti, Nicaragua, Peru
South-East Asia Sear-B	South-East Asia with low child and low adult mortality	Low-mortality developing	Indonesia, Sri Lanka, Thailand
Sear-D	South-East Asia with high child and high adult mortality	High-mortality developing	Bangladesh, Bhutan, Democratic People's Republic of Korea, India, Maldives, Myanmar, Nepal, Timor-Leste
Europe Eur-A	Europe with very low child and very low adult mortality	Developed	Andorra, Austria, Belgium, Croatia, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Israel, Italy, Luxembourg, Malta, Monaco, Netherlands, Norway, Portugal, San Marino, Slovenia, Spain, Sweden, Switzerland, United Kingdom
Eur-B	Europe with low child and low adult mortality	Developed	Albania, Armenia, Azerbaijan, Bosnia and Herzegovina, Bulgaria, Georgia, Kyrgyzstan, Poland, Romania, Slovakia, Tajikistan, The former Yugoslav Republic of Macedonia, Serbia and Montenegro, Turkey, Turkmenistan, Uzbekistan
Eur-C	Europe with low child and high adult mortality	Developed	Belarus, Estonia, Hungary, Kazakhstan, Latvia, Lithuania, Republic of Moldova, Russian Federation, Ukraine
Eastern Mediterrannnean Emr-B	Eastern Mediterranean with low child and low adult mortality	Low-motality developing	Bahrain, Iran (Islamic Republic of), Jordan, Kuwait, Lebanon, Libyan Arab Jamahiriya, Oman, Qatar, Saudi Arabia, Syrian Arab Republic, Tunisia, United Arab Emirates
Emr-D	Eastern Mediterranean with high child and high adult mortality	High-mortality developing	Afghanistan, Djibouti, Egypt,* Iraq, Morocco, Pakistan, Somalia, Sudan, Yemen
Western Pacific Wpr-A	Western Pacific with very low child and very low adult mortality	Developed	Australia, Brunei Darussalam, Japan, New Zealand, Singapore
Wpr-B	Western Pacific with low child and low adult mortality	Low-mortality developing	Cambodia,** China, Cook Islands, Fiji, Kiribati, Lao People's Democratic Republic,** Malaysia, Marshall Islands, Micronesia (Federated States of), Mongolia, Nauru, Niue, Palau, Papua New Guinea,** Philippines, Republic of Korea, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu, Viet Nam

* Following improvements in child mortality over recent years, Egypt meets criteria for inclusion in subregion Emr-B with low child and low adult mortality. Egypt has been included in Emr-D for the presentation of subregional totals for mortality and burden to ensure comparability with previous editions of *The World Health Report* and other WHO publications.

** Although Cambodia, the Lao People's Democratic Republic, and Papua New Guinea meet criteria for high child mortality, they have been included in the Wpr-B subregion with other developing countries of the Western Pacific Region for reporting purposes.

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Page numbers in **bold** type indicate main discussions.