Chapter 1

The state of world health

Introduction

The world's most ruthless killer and the greatest cause of suffering on earth is listed in the latest edition of WHO's International Classification of Diseases, an A to Z of all ailments known to medical science, under the code Z59.5. It stands for extreme poverty.

Poverty is the main reason why babies are not vaccinated, clean water and sanitation are not provided, and curative drugs and other treatments are unavailable and why mothers die in childbirth. Poverty is the main cause of reduced life expectancy, of handicap and disability, and of starvation. Poverty is a major contributor to mental illness, stress, suicide, family disintegration and substance abuse.

Poverty wields its destructive influence at every stage of human life from the moment of conception to the grave. It conspires with the most deadly and painful diseases to bring a wretched existence to all who suffer from it. During the second half of the 1980s, the number of people in the world living in extreme poverty increased, and was estimated at over 1.1 billion in 1990 – more than one-fifth of humanity.

In the time it takes to read this sentence, somewhere in the world a baby has died in its mother's arms. For that mother, the message that her neighbour's infant will live is no consolation. It does not stem her grief to know that 8 out of 10 children in the world have been vaccinated against the five major killer diseases of childhood or that globally, between 1980 and 1993, infant mortality fell by 25% while overall life expectancy increased by more than 4 years, to about 65 years.

Despite these real gains in human health, the baby still lies dead in her arms. Every year in the developing world, 12.2 million children under age 5 die, most of them from preventable causes – preventable, in many cases, for just a few US cents.

Beneath encouraging facts about decreasing mortality and increasing life expectancy, and many other unquestionable advances, lie unacceptable disparities in health – widening gaps between rich and poor, between one population group and another, between age groups and between the sexes.

For most of the people in the world today every step in life, from infancy to old age, is taken under the twin shadows of poverty and inequity, and under the double burden of suffering and disease. For many, the prospect of a longer life may seem more like a punishment than a prize.

By the end of the century we could be living in a world without poliomyelitis, a world without any new cases of leprosy, a world without deaths from neonatal tetanus and measles. But this is still 1995, and some facts of life in the world of today are deeply disturbing.

Some developing countries have less than 4 US dollars to spend per person on health care over an entire year – less than the small change many people in developed countries keep in their pockets or purses.

A person in one of the least developed countries in the world has a life expectancy of 43 years according to 1993 calculations. In one of the most developed countries it is 78 years. That is a difference of more than a third of a century. A rich, healthy man can live twice as long as a poor, sick man.

That inequity alone should stir the conscience of the world – but in some of the poorest countries the picture is getting worse. In 5 countries life expect-

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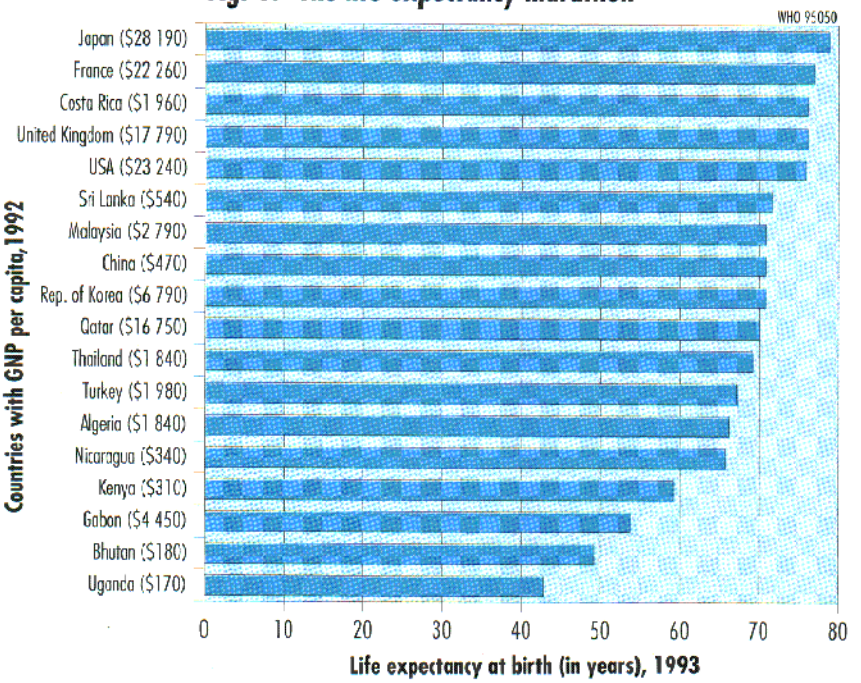
ancy is expected to decrease by the year 2000, whereas everywhere else it is increasing. In the richest countries it will reach 79 by the year 2000. In some of the poorest it will go backwards to 42 years. The gap will thus widen, from 35 years to 37, between rich and poor. By the year 2000 at least 45 countries are expected to have a life expectancy of under 60 years (*Fig. 1*).

Fig. 1. The life expectancy marathon



In the space of a day, passengers flying from Japan to Uganda leave the country with the world's highest life expectancy – almost 79 years – and land in the one with the world's lowest – barely 42 years. A flight between France and Côte d'Ivoire takes only a few hours, but in terms of life expectancy, it spans almost 26 years. A short air trip between Florida in the USA and Haiti represents a life expectancy gap of over 19 years.

The purpose of this report is to highlight such inequities and, in a broader sense, to tackle what might appear to be simple questions, but are in reality highly complex and not amenable to simple answers.

What are the global health priorities? Which are the major diseases, the major causes of death, handicap, disability and reduction of the quality of life? Which conditions cause most misery, although they may not be fatal? Which countries, or communities within countries, have the greatest health needs? Where should health resources be targeted?

Seeking answers to these questions is made more difficult by the poor quality or, in some instances, absence of data. The tools for measuring health status are still insufficient and even those we have can often not be employed because of lack of resources. Moreover what yardsticks should be used to measure health?

One approach is to look at mortality. Figures compiled for this report suggest that globally the biggest group of killers are infectious diseases and parasites, taking 16.4 million lives a year. These are followed by heart disease, which kills 9.7 million.

Another way to measure health is in terms of disease incidence – the number of new cases each year. Looked at this way, the biggest global problem is diarrhoea in children under age 5, with 1.8 billion episodes a year. Diarrhoeal diseases, including dysentery, claim the lives of some 3 million children a year. According to available data sexually transmitted diseases come next, with 297 million new cases per year. In third place are acute lower respiratory infections among children under age 5, such as pneumonia, with 248 million cases.

Yet another way of measuring the disease burden is in terms of prevalence – the total number of people with a given condition. According to this yardstick one of the major global health problems is goitre, with 655 million sufferers. Next comes chronic lung disease, with 600 million sufferers. But for a number of common conditions there are no measurements.

A fourth and even more difficult approach is to try to calculate the disability a disease or condition causes. The available data indicate that the biggest cause of disability across the globe is mood disorders, which affect 59 million. Other disabilities are easier to measure: blindness affects 27 million people and leprosy 2.5 million.

Table 1. Global health situation: leading causes of mortality, morbidity and disability, selected causes for which data are available, all ages, 1993 estimates[a]

Diseases/conditions[b]	Deaths Rank	Deaths Number (000)	Cases Rank	Cases Incidence (00 000)	Cases Rank	Cases Prevalence (00 000)	Disabled persons Rank	Disabled persons Number (permanent and long-term) (00 000)
Ischaemic heart disease	1	4 283		...		...		...
Acute lower respiratory infections under age 5	2	4 110	2	2 483[e]		...		...
Cerebrovascular disease	3	3 854		...		...		...
Diarrhoea under age 5, including dysentery	4	3 010[f]	1	18 210[e]		...		...
Chronic obstructive pulmonary disease	5	2 888		...	2	6 000		...
Tuberculosis	6	2 709		83		200		...
Malaria	7	2 000		...	5	4 000		...
Falls, fires, drowning, etc.	8	1 810		...		...		...
Measles	9	1 160	8	452		...		...
Other heart diseases[c]	10	1 133		...		...		...
Occupational injuries due to accidents		220	3	1 200		...		10
Chlamydial infections (sexually transmitted)		...	4	970[g]		1 620[g]		...
Trichomoniasis		...	5	940[g]	7	2 360[g]		...
Gonococcal infections		...	6	780[g]		720[g]		...
Occupational diseases		...	7	690		...		...
Whooping cough		360	9	431		...		...
Genital warts		...	10	320		...		...
Goitre		...		...	1	6 550		...
Neurotic, stress-related and somatoform disorders		...		...	3	5 018		...
Hypertensive disease		...		...	4	4 906		...
Asthma		...		...	6	2 750		...
Ascariasis (roundworm)		60		...	8	2 140		...
Schistosomiasis		200		...	9	2 000		...
Mood (affective) disorders		...		...	10	1 970	1	591
Lymphatic filariasis		...		...		1 000	2	430
Hearing loss (41 decibels and above) over age 3		...		...		...	3	420
Mental retardation (all types)		...		...		826	4	413
Cataract-related blindness		...		109		...	5	158
Epilepsy		...		...		298	6	149
Dementia		...		...		224	7	112
Poliomyelitis		5.5[d]		1.1		...	8	100
Schizophrenia		...		...		158	9	79
Obstructed labour		38		73		...	10	70

[a] Estimates for some diseases may contain cases that have also been included elsewhere; for example, estimates for acute lower respiratory infections and diarrhoea include those associated with measles, pertussis, malaria and HIV.
[b] The ranking of diseases/conditions in this table is based on the 1993 estimates given in *Table 5*.
[c] This category includes heart failure, nonrheumatic endocarditis, diseases of pulmonary circulation, cardiac dysrhythmias and other ill-defined conditions.
[d] Estimate based on case-fatality rate for paralytic cases only.
[e] Incidence estimates refer to number of episodes.
[f] Deaths from dysentery estimated at 450 000.
[g] Refers to maximum estimated value.
... Data not available or not applicable.

Leading selected causes of mortality	Deaths Rank	Deaths Number (000)
Ischaemic heart disease	1	4 283
Acute lower respiratory infections under age 5	2	4 110
Cerebrovascular disease	3	3 854
Diarrhoea under age 5, including dysentery	4	3 010[f]
Chronic obstructive pulmonary disease	5	2 888
Tuberculosis	6	2 709
Malaria	7	2 000
Falls, fires, drowning, etc.	8	1 810
Measles	9	1 160
Other heart diseases[c]	10	1 133

Leading selected causes of morbidity	New cases annually (incidence) Rank	New cases annually (incidence) Number (00 000)	Total cases (prevalence) Rank	Total cases (prevalence) Number (00 000)
Diarrhoea under age 5, including dysentery	1	18 210[e]		...
Acute lower respiratory infections under age 5	2	2 483[e]		...
Occupational injuries due to accidents	3	1 200		...
Chlamydial infections (sexually transmitted)	4	970[g]		1 620[g]
Trichomoniasis	5	940[g]	7	2 360[g]
Gonococcal infections	6	780[g]		720[g]
Occupational diseases	7	690		...
Measles	8	452		...
Whooping cough	9	431		...
Genital warts	10	320		...
Goitre		...	1	6 550
Chronic obstructive pulmonary disease		...	2	6 000
Neurotic, stress-related and somatoform disorders		...	3	5 018
Hypertensive disease		...	4	4 906
Malaria		...	5	4 000
Asthma		...	6	2 750
Ascariasis (roundworm)		...	8	2 140
Schistosomiasis		...	9	2 000
Mood (affective) disorders		...	10	1 970

Leading selected conditions/causes of disability	Disabled persons (permanent and long-term) Rank	Disabled persons (permanent and long-term) Number (00 000)
Mood (affective) disorders	1	591
Lymphatic filariasis	2	430
Hearing loss (41 decibels and above) over age 3	3	420
Mental retardation (all types)	4	413
Cataract-related blindness	5	158
Epilepsy	6	149
Dementia	7	112
Poliomyelitis	8	100
Schizophrenia	9	79
Obstructed labour	10	70

On the basis of the data available and considered as reasonably reliable, 10 leading causes of death, illness and disability have been identified (*Table 1*). Lack of data on certain diseases has necessarily resulted in a bias that can only be progressively corrected.

The report highlights major health concerns in the world today; it does not attempt to prescribe solutions, although in some cases options are outlined. At the same time the report examines the burden of ill-health not just by disease, but also by age, as the impact of illness differs across the age spectrum. Obviously there are overlaps: malaria, for instance, affects both babies and elderly people. Where possible, however, health status has been assessed for infants and children, for adolescents, for adults and women in particular and for the elderly.

This analysis is followed by an account of what WHO is doing to bridge the gaps in health, by tackling some of the diseases and conditions that kill, disable and inflict untold suffering across the planet. Highlights of the work in different WHO regions[a] are presented. The report ends with an attempt to forecast health trends in the coming years and to chart a future for humanity – a future in which a baby will live, not die in its mother's arms.

Child health[b]

Each year the world sees some 145 million children born. For millions, their brief existence is marked by pain and disease and ends in tragically early death.

In 1993 more than 12.2 million children under the age of 5 died – a number equal to the entire populations of Norway and Sweden combined; twice as many living souls as there are in Switzerland or Hong Kong; three times the population of Ireland or New Zealand. However, 1993 also saw the number of children dying from vaccine-preventable diseases reduced by 1.3 million compared with 1985 – equal to the population of Trinidad and Tobago.

Nevertheless around 2.4 million deaths among children under age 5 are still due to vaccine-preventable diseases, particularly measles, neonatal tetanus, tuberculosis, pertussis (whooping cough), poliomyelitis and diphtheria.

World goals are to immunize at least 90% of the world's children under age 1 against these diseases by the year 2000, and also to immunize 90% of women of childbearing age. The global immunization programme, which started in its present form in 1974, has been one of the great success stories in preventive medicine – but there are worrying signs that recent gains are being eroded or even reversed by adverse social and economic conditions.

Although there were 800 000 fewer deaths from measles in 1993 than in 1985, the disease still kills about 1.2 million children each year in the developing world. In 1993 global immunization rates, per 100 surviving infants, stood at:

- 80 per 100 for poliomyelitis (3 doses);
- 79 per 100 for diphtheria-pertussis-tetanus (3 doses);
- 85 per 100 with BCG;
- 78 per 100 for measles.

However, these figures disguise deep pockets of unimmunized children. In the deprived inner-city areas of many industrialized countries, coverage is lower than in the developing world, while overall rates in Africa (at around 50%) are still significantly below the global average. Despite immunization the toll of infant and child deaths is likely to increase because of growth in the world population coupled with inability to provide optimal mother-and-child health care in many of the developing and least developed countries, where most of the deaths occur.

The gap between developed and developing world in terms of infant and child survival is one of the starkest examples of health inequity. In parts of the developed world only 6 out of 1 000 liveborns die before reaching age 5, whereas in 16 of the least developed countries the rate is over 200 per 1 000, and in one country it is 320 per 1 000. Infant mortality – deaths of children under age 1 – varies from 4.8 per 1 000

[a] See the section *Regional highlights* in *Chapter 2*, which also shows the distribution of Member States and Associate Members in the six WHO regions: Africa, Americas, Eastern Mediterranean, Europe, South-East Asia, Western Pacific.

[b] The age groupings used for the purpose of this report are: children, including infants (under age 5); school-age children and adolescents (5-19 years); adults (20-64 years); and the elderly (65 years or more). Where information cannot be assigned to one of these categories, it is given under *General health issues*.

live births to 161 – a 33-fold difference.

Of all the deaths in the developing world (adults and children combined), 31% are among children under age 5 – and most of these could have been avoided if those countries enjoyed the same health and social conditions as the world's most developed nations. Instead of more than 12 million deaths, there would have been 366 000.

In the developing world some 23% of deaths among children under age 5 occur in the first week of life, and 33% within the first month. While just under a quarter of neonatal (first week) deaths are due to prematurity and congenital defects, two-thirds of perinatal (first month) deaths are associated with the delivery itself or immediate complications and infections. In developed countries too perinatal deaths are linked to obstetric practices.

In general, while infant and child mortality rates reflect the socioeconomic development of a country, deaths during the first four weeks – and maternal deaths – are largely preventable by health care. Much of the variation between the developing and developed world in deaths among newborns can be explained by differences in antenatal care – about half of all pregnant women in the least developed countries have no antenatal care and 7 out of 10 babies are born without the help of a trained birth attendant.

Other factors contributing to perinatal and maternal mortality are the number and timing of pregnancies, and maternal malnutrition – over half the pregnant women in the developing world are anaemic (which also results in high rates of low birth weight). Nearly a quarter of newborns in the least developed countries weigh less than 2.5 kg, a rate nearly four times that in the developed countries.

Infant mortality

For most countries the infant mortality rate remains the best available overall indicator of health and development status. Although huge disparities persist, globally the infant mortality trend has been encouraging, dropping from an average of 82 per 1 000 live births in 1980 to about 62 in 1993. However, about 3 million babies in the developing world die during the first week of life.

While many countries have already reached the WHO targets for the year 2000 of infant mortality of 50 or less per 1 000 live births, and of mortality under age 5 that does not exceed 70 per 1 000 live births, at least 56 countries for which data are available have not been able to do so; and 46 of those countries are also unable to meet another key WHO target, an average life expectancy of above 60 years. In at least 15 other countries infant mortality is estimated to be above 50 per 1 000 live births. This means that in at least 71 countries with

Box 1. The most deprived one in six

A baby girl born in one of the least developed countries in 1993 can expect to live barely 44 years – 2 years more than a baby boy born in the same year. Her problems begin before birth since her mother is likely to be in poor health. If she is born in southern Asia, she has a 1 in 3 chance of being underweight, a greater chance of dying in infancy and a high probability of being malnourished throughout childhood. She has a 1 in 10 chance of dying before her first birthday and a 1 in 5 chance of dying before her fifth. In some African countries her chance of being vaccinated is less than 1 in 2. She will be brought up in inadequate housing under insanitary conditions contributing to diarrhoeal disease, cholera and tuberculosis. She will have a 1 in 3 chance of ever getting enough schooling to learn how to read and write. She may be circumcised at puberty with consequent effects on her life as a woman and a mother. She will marry in her teens and may have 7 or more children close together unless she dies in childbirth before that. Ancient traditions will prevent her from eating certain nutritious foods during her pregnancies, when she most needs building up, and dangerous practices such as using an unsterile knife to cut the umbilical cord and placing cow-dung on the stump may kill some of her babies with tetanus.

She will be in constant danger from infectious disease from contaminated water at the place where she bathes, washes clothes and collects her drinking-water. She will be chronically anaemic from poor nutrition, malaria and intestinal parasites. As well as caring for her family she will work hard in the fields, suffering from repeated attacks of fever, fatigue and infected cuts. If she survives into old age she will be exposed to the same afflictions as women in the rich countries: cardiovascular disease and cancer. To these she will succumb quickly, having no access to proper medical care and rehabilitation. She will not be able to pay anything herself: her country currently has less than $9[c] a year to spend on her health.

Some 24 million babies, one-sixth of the world total, were born in the least developed countries in 1993 and too many of them will grow up in miserable conditions of life and health. Equity demands that the situation of these deprived infants be improved without delay.

[c] Throughout this report the sign $ denotes United States dollars.

a total population of almost 2.5 billion, or almost 45% of the world population, infant mortality is 50 per 1 000 or more. The majority of these children are in Africa, and some in Asia.

The gap in infant mortality between the developed and developing world narrowed by 50% during the years 1960-1993, from 113 to 54 per 1 000 live births. At the same time the gap between least developed and developing countries widened (*Boxes 1 & 2*).

Projections suggest that in the year 2000 infant mortality in developed market-economy countries will be about 6 per 1 000, in the developing world as a whole about 60, and in least developed countries about 97. At the same time there are striking variations within regions as well as between regions. In the Americas, for example, the extremes ranged in 1993 from just over 10 in Cuba to 86 in Haiti. In Thailand the figure is just over 27, and in Bangladesh almost 107. However, higher material income need not necessarily imply a lower infant mortality or a high life expectancy at birth (*Table 2*). Several low-income countries have achieved rates that are comparable to those of richer countries.

Box 2. The fortunate one in eight

A baby girl born in one of the richest countries in 1993 can expect to live to the age of 82 – 6 years longer than a baby boy born in that country the same year. As she grows up she will be assured of adequate nutrition, hygienic living conditions, schooling and advanced medical care. She will receive full vaccination against all childhood diseases at the appropriate age and the proper intervals. She will probably not marry until she reaches her twenties and will then have one or two children, properly spaced and delivered in hospital after regular prenatal checkups. The greatest dangers to her health in her middle years will be the risk of an accident at home or while she is out driving, or a particularly virulent influenza epidemic. As she enters old age she will be liable to develop cardiovascular disease or cancer, but will survive the first attacks of these with little disability because of excellent medical care and rehabilitation services. She will receive good institutional care in her old age. She will spend on average, including government assistance, the equivalent of $1 540 on her health every year.

Some 17 million babies, one in eight of the world total, were born in the more developed nations in 1993 and most of them will grow up to enjoy conditions of life and health similar to those of this fortunate little girl.

Mortality in children under age 5

It is estimated that in 1993 global mortality among children under age 5 was 87 per 1 000 live births, i.e. for every 1 000 babies born alive, 87 would die before reaching age 5. This reflects a perceptible fall from rates of 215 during the period 1950-1955 and of 115 in 1980. However, most of the reduction is due to lower infant mortality; and it raises the question of the state of health of those children who, having survived the hazards of infancy, may subsequently be malnourished and impaired in learning and development by their fifth birthday.

Once again there are substantial differences between countries. Mortality under age 5 in the developed world was an estimated 15 per 1 000 live births in 1993, while in the developing world the figure was 97. The rate for least developed countries alone was 161.

As with infant mortality generally, the gap in mortality of children under age 5 between the developed and developing world has narrowed since 1950; but it has widened between less and least developed countries.

In the developing world, total deaths among children under age 5 in 1993 were 12.2 million, down from 13.3 million in 1985 (*Fig. 2*). Mortality was 97 per 1 000, compared with 115 in 1985. This reduction was largely due to a 35% drop in vaccine-preventable deaths as well as 13% fewer deaths from acute respiratory infections (about 8% of them from pneumonia) and 10% fewer from diarrhoea (including about 7% from diarrhoea alone).

The effects of poor nutrition

Malnutrition contributes substantially to childhood death and disease but often goes unrecognized as such. In 1990 more than 30% of the world's children under age 5 were underweight for their age. The proportion ranged from 11% of children in Latin America to 41% in Asia. The figure for Africa was 27%. This means that in 1990 some 31.6 million children in this age group were underweight in Africa, 6.4 million in Latin America and 154.8 million in Asia. In

the Near East the figure was 5.3 million. Although malnutrition is generally decreasing, in some areas the gain will be more than cancelled out by continuing high fertility. For example in Africa the proportion of underweight children is expected to drop from 27% in 1990 to 25% in 2005 – but the actual number will increase from 31.6 million to 39.2 million because there will be more children. In endemic areas malaria compounds the effects of poor nutrition.

The effects of some specific diseases of malnutrition have been assessed. Protein-energy malnutrition is a condition whereby people lack both energy from carbohydrates, essential protein, and vitamins and minerals. It is characterized by low birth weight if the mother is malnourished, poor growth in children and high levels of mortality in children between 12 and 24 months, and is estimated to be an underlying cause in 30% of deaths among children under age 5. While protein-energy malnutrition generally is declining, the rate is increasing in some sub-Saharan countries.

As many as 43% of children in the developing world – 230 million children – have low height for their age (i.e. stunting) and 9% – 50 million children – have low weight for height. The rate of low height for age reflects the cumulative effects of undernutrition and infections since birth or even before birth; high rates are often suggestive of bad environmental conditions and/or early malnutrition. A greater frequency of low weight for height, on the other hand, often reflects current severe undernutrition or disease. Some three-quarters of the world's malnourished children are to be found in Asia and although the overall prevalence is slowly falling, the numbers continue to rise.

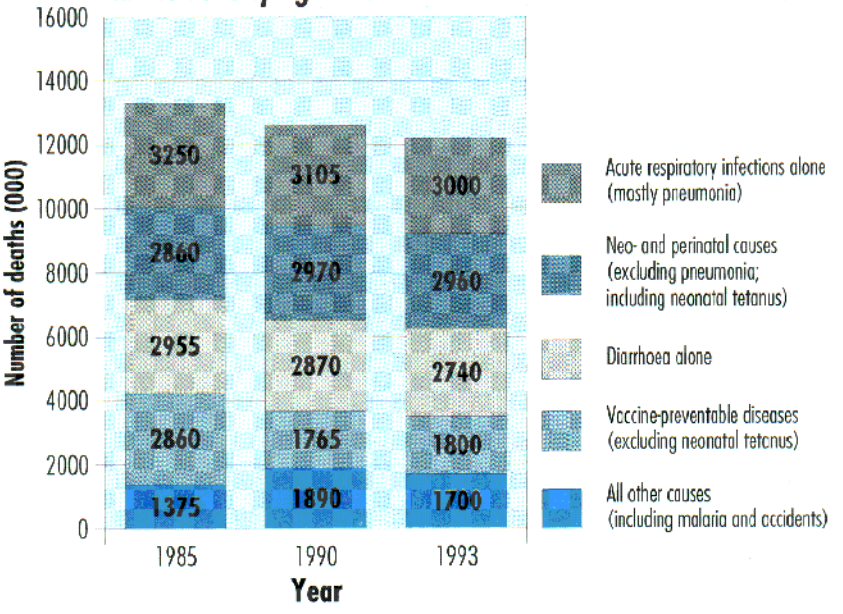
Micronutrient malnutrition, estimated to affect at least 2 billion people, refers to a group of conditions caused by deficiency of essential vitamins and minerals such as vitamin A, calcium, iodine, iron and zinc. Vitamin A deficiency is still the commonest cause of preventable childhood blindness worldwide; iodine deficiency causes goitre, cretinism and brain damage; and anaemia results from insufficient iron intake. In the developing world, more than 55% of pregnant women are anaemic. More subtle consequences of deficiencies include reduced effectiveness of the body's immune system.

Iodine deficiency disorders pose a public health problem in 118 countries, with over 1.5 billion people living in environments lacking this mineral. As a result at least 30 000 babies are stillborn each year and over 120 000 are born mentally retarded, physically stunted, deaf-mute or paralysed. Even when children are born otherwise healthy, a lack of iodine will trap them in mental dullness and apathy. The solution – iodizing salt supplies – is relatively simply and costs as little as $ 0.05 per person per year.

Table 2. Income ranges with life expectancy at birth and infant mortality rate

Income range (per capita GNP in US$) **1992**	**Life expectancy at birth** (years) **1993**	**Infant mortality rate 1993**
15 000 and above	70–79	5–26
10 000–14 999	72–78	7–22
5 000–9 999	63–77	9–68
1 000–4 999	51–76	10–93
500–999	45–72	24–133
100–499	43–71	27–158

Fig. 2. Main causes of death among children under age 5 in the developing world



A quarter of children under age 5 in developing countries are at risk of vitamin A deficiency. Some 20% of children with this deficiency are at increased risk of death from common infections, and around 2% are blinded or suffer serious sight impairment. A number of countries have organized twice-yearly distribution by vaccination teams of vitamin A capsules to children between 6 months and 6 years. The capsules cost around $ 0.02 each.

The burden of disease

Of the more than 4 million deaths a year from acute respiratory infections in the developing world, a quarter are linked to malnutrition, and a further quarter associated with pulmonary complications of measles, pertussis (whooping cough), malaria and HIV/AIDS. Some 70% of deaths from acute respiratory infections occur before the first birthday. In 1993 one-quarter of all deaths among children under age 5, over 3 million, were due to diarrhoea and more than half of these children were malnourished. Malaria, alone or with complications, claimed nearly 1 million victims, most of them in Africa and South-East Asia (*Table 3*).

Acute respiratory infections, particularly pneumonia, were the leading causes of death and accounted for an estimated 4.1 million deaths among children under age 5 in the developing world. They are also an important cause of morbidity in children. On average, a child in both developed and developing countries has from 5 to 8 attacks annually. Although most of these attacks are mild, self-limiting episodes, they are a frequent reason for seeking health care, accounting for 30-50% of visits by children to health facilities everywhere. They are also a leading cause of disability, including deafness as a sequela of otitis media.

The incidence and severity of lung infections (pneumonia) are not spread evenly around the world. The incidence of pneumonia is almost constant in children in developed countries, varying from 3-4% a year. By contrast, the incidence in developing countries ranges between 10% and 20% but it may reach much higher levels in areas with high prevalence of risk factors such as malnutrition, low birth weight and indoor air pollution.

The problem is of enormous dimensions, but there is a workable solution. Significant and immediate reductions in mortality can be achieved by treating the underlying bacterial infections with low-cost antibiotics for a few days. More than 4 million children are dying each year – one every 8 seconds – because of a lack of appropriate antibiotics given orally for 5 days, which cost on average $0.20 per treated child.

To prevent measles and pertussis (whooping cough) it is essential to ensure that children are fully immunized. It is also important to fortify the nutritional status of children, to improve birth weight and to reduce children's exposure to indoor air pollution (*Box 3*).

Box 3. Breast-feeding

Breast-feeding is an ideal way of providing food for the healthy growth and development of infants and has a unique biological and emotional influence on the health of the mother and child. The anti-infective properties of breast milk help to protect infants against disease. Breast-feeding is associated with lower rates of ovarian and premenopausal breast cancer. It helps to reduce sepsis in newborn babies as well as chest, ear and urinary tract infections in children and gives significant protection against illness and death associated with diarrhoea in infants. Breast-feeding favours child-spacing.

Available data indicate that breast-feeding has declined in many parts of the world for a variety of social, economic and cultural reasons. With the introduction of modern technology and the adoption of new lifestyles, less importance is being attached to this traditional practice in many societies, precisely those where it is most necessary to safeguard the health of infants.

It is true that in some developed countries breast-feeding rates have shown a marked improvement. This is attributed to a combination of public education, social support and greater awareness on the part of health workers. Often, however, health services unwittingly contribute to the declining trend, either by failing to support and encourage mothers or by introducing procedures that interfere with the normal initiation of breast-feeding. Common examples of this are separating mothers from their infants at birth, giving glucose water by bottle and teat before lactation has been started, and routinely encouraging the use of breast-milk substitutes.

It is therefore essential that the staff of maternity wards and clinics for maternal and child health and family planning receive basic and in-service training on the health benefits of breast-feeding and on lactation management. All other health workers should be made fully aware of the importance of breast-feeding.

Table 3. Estimated mortality among children under age 5 in the developing world, by cause of death [a]

	Cause of death	1985		1990		1993		Malnutrition-associated[b]	
		Number (000)	% of total	Number (000)	% of total	Number (000)	% of total	Number (000)	% of total
	Total	**13 300**		**12 600**		**12 200**		**3 549**	
	Acute respiratory infections	**4 730**[c]	**35.6**	**4 200**[d]	**33.3**	**4 110**[e]	**33.7**	**1 090**	**30.7**
1	ARI (mostly pneumonia)	3 250[c]	24.4	3 105[d]	24.6	3 000[e]	24.6	754	21.2
2	ARI/measles	1 085	8.2	605	4.8	640	5.2	197	5.5
3	ARI/pertussis	395	3.0	275	2.2	260	2.1	74	2.1
4	ARI/malaria	—	--	195	1.5	190	1.6	55	1.5
5	ARI/HIV-related	—	--	20	0.2	20	0.2	10	0.3
	Neo- and perinatal	**3 640**[d]	**27.4**	**3 750**[d]	**29.8**	**3 715**[e]	**30.5**	**258**	**7.3**
6	Birth asphyxia	750	5.6	840	6.7	840	6.9	—	--
7	Neonatal tetanus	790	5.9	555	4.4	560	4.6	—	--
8	Congenital anomalies	395	3.0	440	3.5	440	3.6	—	--
9	Birth trauma	375	2.8	420	3.3	420	3.4	—	--
10	Prematurity	375	2.8	420	3.3	410	3.4	258	7.3
11	Neonatal sepsis and meningitis	175	1.3	295	2.3	290	2.4	—	--
	Diarrhoea	**3 350**[f]	**25.2**	**3 125**	**24.8**	**3 010**	**24.7**	**1 738**	**49.0**
12	Diarrhoea alone	2 955	22.2	2 870	22.8	2 740	22.5	1 582	44.6
13	Diarrhoea/measles	395	3.0	215	1.7	230	1.9	131	3.7
14	Diarrhoea/HIV-related	—	--	40	0.3	40	0.3	25	0.7
	Vaccine-preventable	**3 650**	**27.4**	**2 320**	**18.4**	**2 360**	**19.3**	**607**	**17.1**
2	ARI/measles	1 085	8.2	605	4.8	640	5.2	197	5.5
7	Neonatal tetanus	790	5.9	555	4.4	560	4.6	—	--
15	Measles alone	495	3.7	275	2.2	290	2.4	175	4.9
16	Tuberculosis	295	2.2	295	2.3	280	2.3	—	--
3	ARI/pertussis	395	3.0	275	2.2	260	2.1	74	2.1
13	Diarrhoea/measles	395	3.0	215	1.7	230	1.9	131	3.7
17	Pertussis alone	195	1.5	100	0.8	100	0.8	30	0.8
	Measles	**1 975**	**14.8**	**1 095**	**8.7**	**1 160**	**9.5**	**503**	**14.2**
2	ARI/measles	1 085	8.2	605	4.8	640	5.2	197	5.5
15	Measles alone	495	3.7	275	2.2	290	2.4	175	4.9
13	Diarrhoea/measles	395	3.0	215	1.7	230	1.9	131	3.7
	Malaria	**740**	**5.6**	**955**	**7.6**	**940**	**7.7**	**121**	**3.4**
18	Malaria alone	—	--	635	5.0	680	5.6	66	1.9
4	ARI/malaria	—	--	195	1.5	190	1.6	55	1.5
19	Malaria/anaemia	—	--	125	1.0	70	0.6	—	--
	Pertussis	**590**	**4.4**	**375**	**3.0**	**360**	**3.0**	**104**	**2.9**
3	ARI/pertussis	395	3.0	275	2.2	260	2.1	74	2.1
17	Pertussis alone	195	1.5	100	0.8	100	0.8	30	0.8
	Malnutrition	**—**	**--**	**250**	**2.0**	**190**	**1.6**	**120**	**3.4**
20	Malnutrition alone	—	--	125	1.0	120	1.0	120	3.4
19	Malaria/anaemia	—	--	125	1.0	70	0.6	—	--
21	**Meningitis**	**—**	**--**	**145**	**1.2**	**100**	**0.8**	**21**	**0.6**
	HIV-related	**—**	**--**	**75**	**0.6**	**75**	**0.6**	**40**	**1.1**
14	Diarrhoea/HIV-related	—	--	40	0.3	40	0.3	25	0.7
5	ARI/HIV-related	—	--	20	0.2	20	0.2	10	0.3
22	HIV/others	—	--	15	0.1	15	0.1	5	0.1
23	**Congenital syphilis**	**—**	**--**	**195**	**1.5**	**190**	**1.6**	**—**	**--**
24	**Accidents**	**195**	**1.5**	**195**	**1.5**	**170**	**1.4**	**—**	**--**
25	**All other causes**	**440**	**3.3**	**200**	**1.6**	**105**	**0.9**	**46**	**1.3**

[a] Estimates as of 1 August 1994 and total deaths based on *World population prospects, 1992 revision*. New York, United Nations, 1993. First column gives item reference number.
[b] Based on the assumption that the percentage of malnutrition-asociated deaths for a given cause is constant, and that the change in the number of malnourished children is equal to changes in cause-specific deaths between 1990 and 1993.
[c] Including ARI/malaria and ARI/HIV-related deaths and 780 000 deaths from neonatal pneumonia.
[d] Including 780 000 deaths from neonatal pneumonia.
[e] Including 755 000 deaths from neonatal pneumonia.
[f] Including diarrhoea/HIV-related deaths, since they were not listed separately in 1985.
— Data not available.
-- Data not applicable.

Diarrhoeal diseases were responsible for around 3 million childhood deaths in the developing world in 1993.

Diarrhoeal diseases are associated with unsafe water and poor sanitation, coupled with poor food-handling practices. They are a graphic example of the synergy of poverty and lack of knowledge. Prevention and control, therefore, do not solely rest with the health services but depend on education and economic development.

Diarrhoeal diseases were responsible for around 3 million childhood deaths in the developing world in 1993. About 80% of these deaths occurred in the first two years of life. The main cause of death from acute diarrhoea is dehydration from the loss of fluids and electrolytes. Across the globe there are an estimated 1.8 billion episodes of childhood diarrhoea annually, mostly in developing countries. Each episode of diarrhoea, if not properly managed, contributes to malnutrition; when episodes are prolonged their negative impact on growth is increased. In terms of incidence, or new cases per year, this condition dwarfs all others.

Many of the deaths due to diarrhoea could also be prevented through the early replacement of fluids, usually by mouth, using whatever fluids are available in the home, and continued feeding. Children fed actively during and after diarrhoea have a better outcome; they grow normally even if they suffer repeated episodes. If children develop signs of dehydration, a special fluid containing a balanced mixture of salts (oral rehydration salts, or ORS) is needed. This fluid can be prepared in the home by mixing water with a packet of ORS.

ORS cost on average just $0.07. Thanks to local production and support from the international community, these packets are now widely available in developing countries. In some 10% of cases of dehydration, even these salts are insufficient and intravenous rehydration is required.

With multisectoral action to promote nutrition (in particular breastfeeding), food safety, education and hygienic behaviours (handwashing, proper disposal of faeces, maintaining drinking-water free from faecal contamination, thorough cooking of food) as well as through immunization against measles, the number of episodes could be substantially reduced.

Neonatal tetanus is usually caused by the introduction of tetanus spores either during delivery when the umbilical cord is cut with an unclean instrument or after delivery when the umbilical stump is "dressed" with heavily-contaminated substances, frequently as part of birth rituals. Overall the disease is fatal in 8 out of 10 cases, and it claimed the lives of an estimated 560 000 newborn babies in 1993.

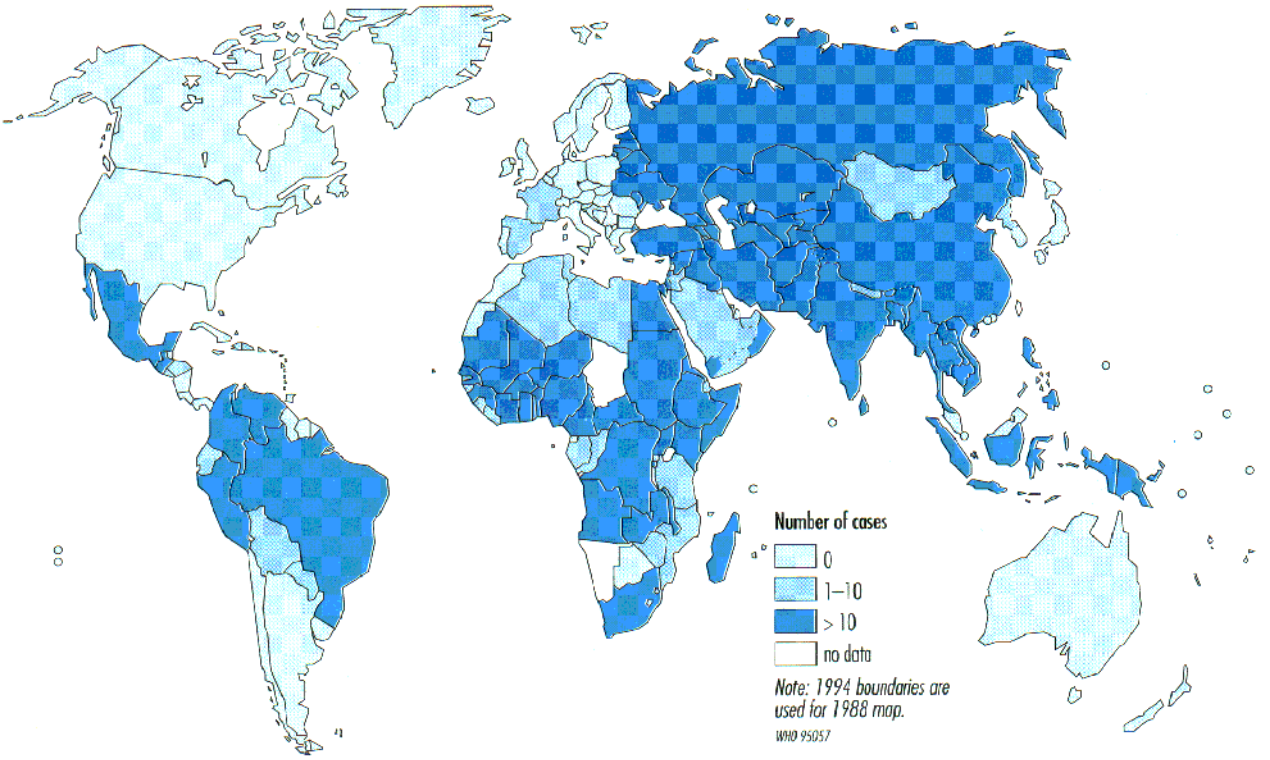
The goal of eliminating neonatal tetanus has been achieved in many countries and areas, particularly through expanded immunization of women of childbearing age with tetanus toxoid. Globally, however, coverage of women is below the rates for other childhood immunizations and has risen relatively slowly, from 34% in 1990 to 45% in 1993.

Alongside immunization, the use of simple inexpensive instruments during birth can contribute substantially to tetanus reduction. Kits containing sterile equipment such as a razor blade, soap, cotton, a thread and a plastic sheet to provide a clean delivery surface have been used to very good effect in China and other parts of the world. They are usually made locally. In Nepal, for example, they are produced by a women's cooperative and sold at a very low price.

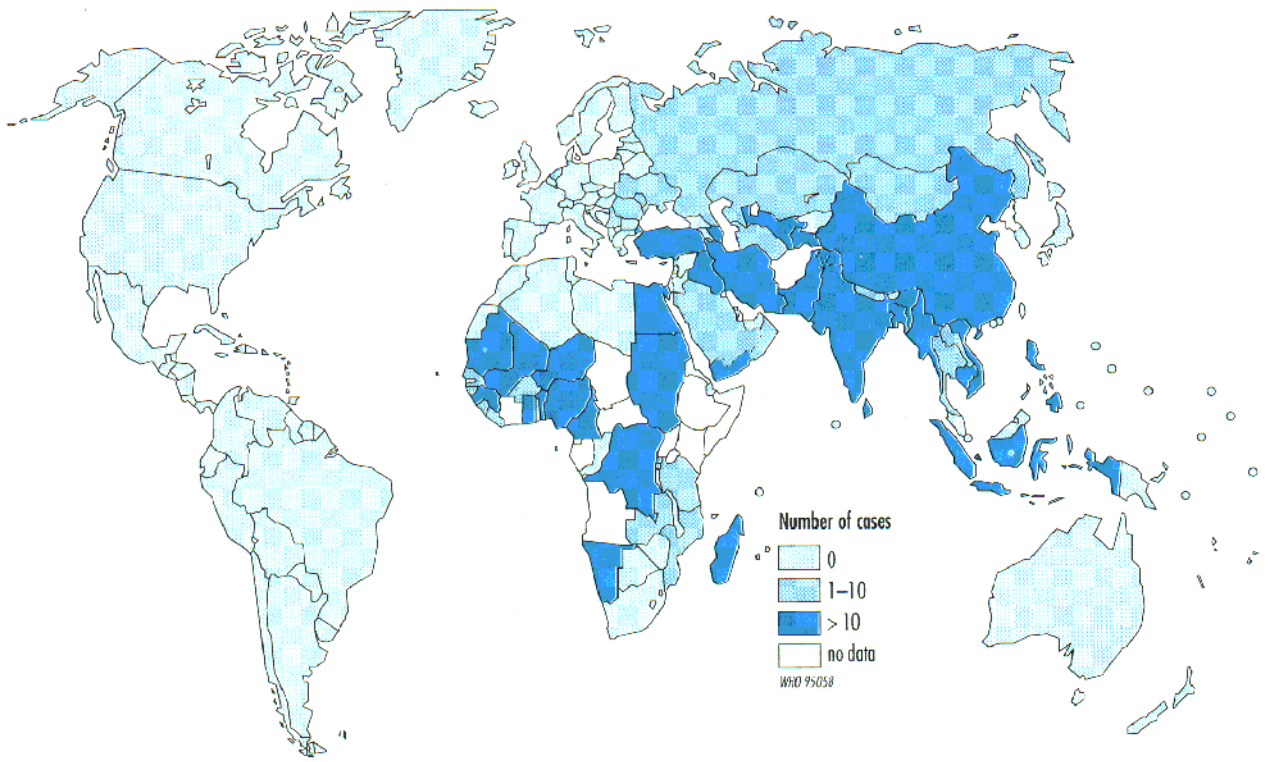
Overall, on the basis of reported coverage and estimated vaccine efficacy, WHO calculates that in 1992 ***immunization*** prevented 2.9 million deaths from measles, neonatal tetanus and pertussis in the developing world as well as 563 000 cases of paralytic poliomyelitis. Nevertheless there were more than 2 million deaths from measles, neonatal tetanus and pertussis, and over 114 000 cases of poliomyelitis during that year (*Maps 1A & 1B*). Among children born in most of the developing world, 1 in 1 000 can be expected to become lame from poliomyelitis, 4 in 1 000 to die from neonatal tetanus, 3 in 1 000 from pertussis and 1 in 100 from measles.

Since the mid-1980s there has been a striking resurgence of diphtheria in parts of eastern Europe, the Russian

Map 1A. Global incidence of indigenous poliomyelitis, 1988



Map 1B. Global incidence of indigenous poliomyelitis, 1993



Federation and Ukraine. The main reasons are decreasing immunization coverage among infants and children, waning immunity in adults, population movements and an irregular supply of vaccines.

In developing countries routine immunization was introduced in the late 1970s, and coverage of infants with three doses of diphtheria toxoid reached 46% in 1985, and 79% in 1992. Recent diphtheria outbreaks in a number of countries have demonstrated a shift in the age distribution of cases to older children and adults.

Measles vaccine costs $0.14 per dose, and diphtheria-pertussis-tetanus vaccine $0.60. Because it involves only a slight increase in cost, yellow fever vaccine has been added in the last two years to the immunization schedules of 17 of the 33 African countries at risk from this disease, and 48 countries now give routine hepatitis B vaccination to children to help prevent liver cancer.

Malaria, directly or in association with acute respiratory infections and anaemia, kills more than 1 million children a year in the developing world, accounting for about half of all malaria deaths globally, most of them in Africa. Because of the combined effects of nutritional deficiencies and malaria, many women in malarious regions are anaemic. As a result, at least 25% of babies of first pregnancies in some endemic areas have low birth weight.

Recent studies show that children's lives can be saved by bednets impregnated with insecticides. One study in Gambia found that the use of such nets reduced malaria deaths among children by 60-70%.

Ascaris, *Trichuris* and hookworm infections are associated with undernutrition, growth stunting and iron deficiency in children, and have an adverse effect on cognitive function in schoolchildren. It is estimated that some 204 million children aged 5-14 are affected, or 1 in 5.

Dengue also significantly affects children.

Rheumatic fever, which can cause fatal heart problems, is a major health concern in developing countries, accounting for 3 out of 10 hospital admissions.

Diabetes mellitus affects about 1 in every 1 000 children under age 15 in industrialized countries, although it appears to be rarer in developing countries – perhaps because it may be overlooked or inadequately treated. Insulin is widely available in industrialized countries, but not in the developing world because of its price there. It costs $10-12 per vial in Africa and Latin America, as compared with only $2 in western Europe. Owing to lack of insulin, many children with diabetes in developing countries die within five years of onset of the disease.

Children are bearing a huge and growing burden from the ***HIV/AIDS***

Box 4. Behaviour and health

Political, economic, social, cultural, environmental and biological factors can all favour or be harmful to health. Behaviour is of importance to health either directly through learned lifestyles or indirectly in the environmental and socioeconomic context. Personal choice of behaviour can be one of several risk factors acting in combination to cause a disease (for instance poor diet, lack of exercise and smoking all contribute to cardiovascular diseases). At the same time individual and collective behaviour plays an indirect but crucial role in the prevention and control of many communicable diseases.

Lifestyle-related diseases and conditions are responsible for 70-80% of deaths in developed countries and about 40% in the developing world. Examples are cardiovascular diseases, cancer, diabetes, chronic bronchitis, obesity, malnutrition, mental and behavioural disorders, accidents and violence, alcohol and drug dependency, HIV/AIDS and other sexually transmitted diseases, vaccine-preventable infectious diseases, vectorborne and foodborne diseases, and low birth weight.

Changing people's behaviour requires an understanding of the practice and reasons that underly it as well as a clear idea of the preferred behaviour. The aim of health promotion policies and programmes should be to stimulate health awareness and responsibility and to advocate conditions which favour health.

Among the successful interventions with a significant communication and education component have been use of oral rehydration salts by mothers to prevent diarrhoeal disease in children under age 5; organization of immunization campaigns; the reduction of ischaemic heart disease in some developed countries; and improvement of nutrition. Similarly studies in developing countries have shown that mothers' knowledge of childbirth influences their participation in prenatal counselling, pregnancy behaviour and compliance with dietary recommendations. Experience of schistosomiasis control too has shown that a combination of education and community-based diagnostic and treatment services gives the best results.

The main ecological, social, economic and political actions required to create supportive environments include establishing healthy public policy with the involvement of all sectors; strengthening community participation and upgrading personnel skills; and reorienting health services towards prevention and health promotion.

pandemic, both directly as sufferers and as a result of seeing parents, siblings and other relatives die. It is estimated that by the year 2000 there will be over 5 million children infected with HIV and perhaps a further 5-10 million who have been orphaned since the pandemic began. Many AIDS orphans lack love and family support and risk becoming street children with all the attendant perils to health and emotional well-being that such a life brings.

The factors which govern transmission of the virus from infected mother to newborn baby are still far from being understood. Maternal transmission rates seem to vary across the globe, ranging from around 13% in Europe to around 30-40% in developing countries, according to some studies. The infectivity of different strains of HIV or the immune system of the mother (often weakened by malnutrition and other diseases) may be factors in the higher transmission rates in developing countries.

In Africa about 700 000 children were born to HIV-positive women in 1993 alone, of whom perhaps one- third were themselves infected. In Zambia and Zimbabwe it is calculated that AIDS will increase mortality between the ages of 0 and 4 years nearly threefold. In Thailand AIDS will increase child mortality nearly fivefold, and in Kenya and Uganda the rates will double. In short AIDS will reverse many of the hard-won improvements in child survival which have been achieved in developing countries over the past 20 years.

Health of school-age children and adolescents[d]

Across the world some 2.3 billion people, about 40% of the total population, are aged under 20. It is largely true that teenagers and young adults are biologically healthy, but young people are among the most vulnerable in terms of the diseases of society – poverty, exploitation, ignorance and risky behaviour. The least developed countries have very young and rapidly increasing populations for whom health services are not meeting adolescent needs. Education, training and jobs for the young are not adequate. In squandering the health of its young, the world squanders its tomorrows.

The behaviour patterns established in adolescence, highly influenced by the adult world, are of immense importance to an individual's life span and to public health as a whole. The dramatic expansion of telecommunications and travel, a shrinking or in some cases disintegrating family structure, increased access to harmful substances, earlier puberty and sexual experimentation mean that adolescent behaviour has important health repercussions (*Box 4*).

Despite the difficulties they face, individual young people throughout the world contribute substantially to their

Box 5. Health, education and nutrition

Education of females as a driving force for better health has been extensively studied and documented. Educated women generally do not have early pregnancies, are able to space their pregnancies, have better access to information related to personal hygiene and care of their children, and make better use of health care services. Higher literacy rates among women are associated with low fertility and maternal mortality as well as with low infant mortality. Recent studies demonstrate the complexity of such relationships – for example there appears to be a link between high drop-out rates in primary schools and high prevalence of malnutrition among primary schoolchildren (*Fig. 3*). A recent study in the Indian state of Tamil Nadu, with a population of more than 60 million, showed that a midday meals programme for schoolchildren together with improvement of health care for women and their babies raised retention levels in schools, reduced child mortality, increased immunization rates – and led to a dramatic fall in infant deaths from 90 per 1 000 live births in 1984 to 57 in 1991. This in turn seems to have reduced the fertility level to 2.5 children per woman in 1991 and Tamil Nadu is now said to be on the threshold of achieving zero population growth.

Unesco's *World education report 1993* identified as a major challenge the very large numbers of youths who have never had an opportunity to receive formal education of any kind, or who have dropped out of the formal system before learning anything of value to themselves or society. The 1990 World Conference on Education for All called for innovative approaches to meeting basic learning needs, possibly utilizing the entire range of communication media available to society – popularly called the "third channel" approach. However, global use of resources for a multimedia approach is constrained by the limited communications infrastructure in many countries. Studies on the relative contributions of variables such as education, nutrition and health care and their synergistic effect on maternal and child health are being pursued by WHO to help determine the most efficient allocation of scarce resources for health.

[d] The age groupings used for the purpose of this report are: children, including infants (under age 5); school-age children and adolescents (5-19 years); adults (20-64 years); and the elderly (65 years or more). WHO defines adolescents as being between the ages of 10 and 19, and young people between the ages of 10 and 24.

families' welfare. Even in the most desperate circumstances, many young people demonstrate resilience, courage and idealism which the world cannot afford to lose. Millions belong to non-governmental organizations (NGOs) which promote health and development and a vision of a fairer world.

Education

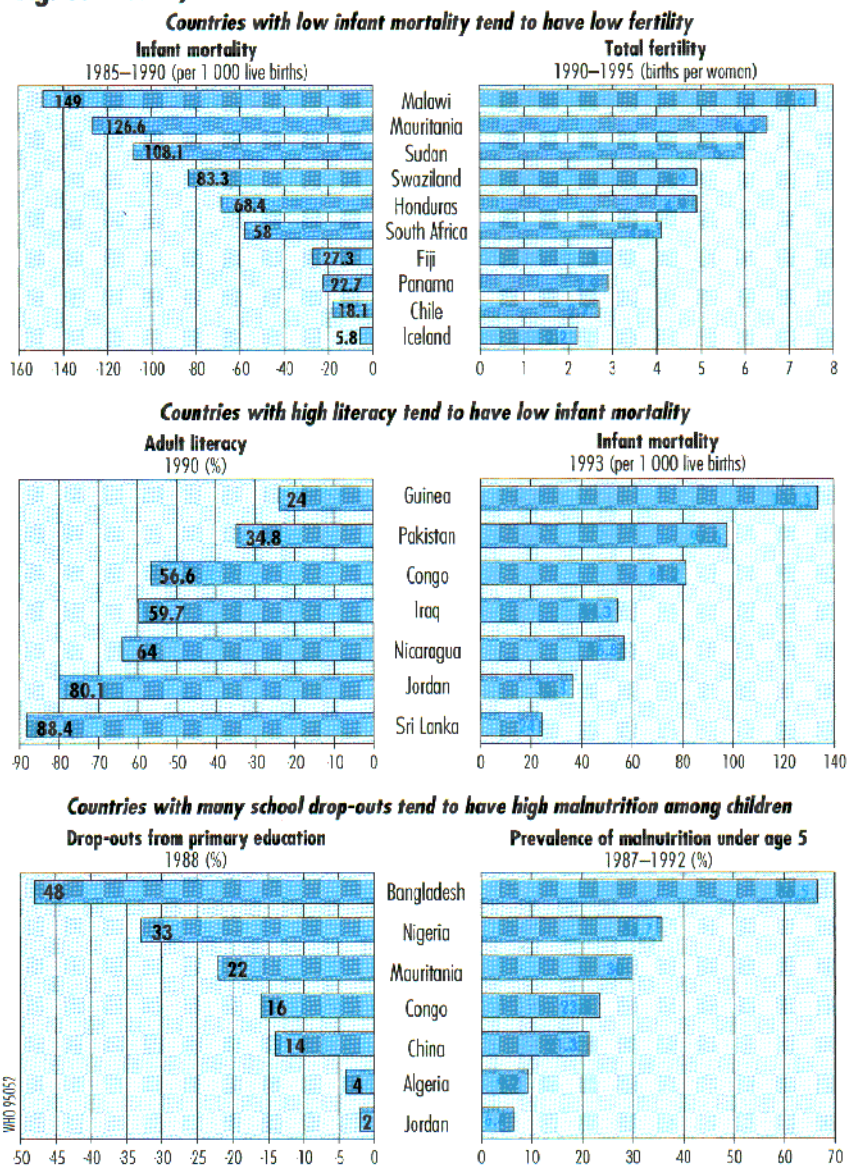
A blackboard and a piece of chalk can be as powerful as antibiotics and effective contraceptives. At first glance education may seem to have little to do with physical well-being and sensible fertility practices – but schooling is closely linked to health status and pregnancy rates (*Box 5 & Fig. 3*). One of the most powerful ways to promote equity, enhance development and protect health for all is to improve the education of adolescents in general and girls in particular. Education is a right to which all young people are entitled. Policies are needed to prolong minimum school-leaving ages realistically, so that girls as well as boys can benefit from modern education and training. Laws that prevent pregnant schoolgirls from attending school jeopardize their future development.

Sexual relationships and their consequences

The desire for sex and a fulfilling relationship are powerful driving forces for most young people as are pressures to engage in sexual relations; yet many are denied even basic knowledge about their own bodies or the means to protect themselves from unwanted pregnancy and sexually transmitted diseases (STDs). Pregnancy in younger women carries far higher risks of death or long-term complications than in older women, and there are severe risks in those aged 13-17. Maternal mortality rates at ages 15-19 are double the rates at 20-24, and those at ages 10-14 five times higher in some countries.

A large proportion of first marriages and first births involve adolescent women in developing countries. Recent surveys in Africa found that in 14 countries at least half the women married before the age of 18. In Niger, for example, nearly half of all women are married by the age of 15, and 2 out of 5 have at least one child by the age of 17. Studies in Latin America and the Caribbean show that 30-60% of marriages take place during adolescence. Against this background, access to information and services to prevent unwanted and too-early pregnancies is the exception rather than the rule. It is often believed that information and the provision of contraception will lead to promiscuity, whereas the evidence suggests the opposite. Moreover effective prevention of pregnancy reduces the number of abortions in young women.

Fig. 3. Health, education and nutrition



Sexually transmitted diseases

STDs are most frequent in sexually active young people aged 15-24 and their high incidence is continuing. The highest rates for notifiable STDs are generally seen in the 20-24 age group, followed by those aged 15-19, then those aged 25-29. However, in most of the world the peak age of infection is lower in girls than in boys.

Although STDs are generally well treated in the developed world, adolescents are the least likely to make use of treatment services because of ignorance or fear of parental disapproval. In the developing world, facilities for treating STDs are given low priority. In addition there are worrying reports that gonorrhoea and chancroid have become resistant to inexpensive antibiotics – thereby increasing the cost of treatment in countries which can least afford it.

The long-term consequences of STDs are well established. They include infertility, pelvic inflammatory diseases, ectopic pregnancy, sepsis which can lead to death, several types of cancer particularly cervical cancer, as well as premature birth and perinatal and congenital problems.

AIDS and HIV

The hopes and lives of a generation, the breadwinners, providers and parents of the future, are in jeopardy. They include many talented citizens such as engineers, teachers, doctors, nurses and craftsmen, who could build a better world and shape the destinies of the countries they live in, and who face tragically early death.

In many countries in the developing world up to two-thirds of all new HIV infections may be occurring among 15-24 year olds. Overall it is estimated that half the global HIV infections have been in people under age 25. Up to 60% of infections in females are believed to occur by the age of 20.

The death toll from AIDS is expected to exceed 8 million by the year 2000. Most of these deaths will be in developing countries, and the remainder will be increasingly among people living in the industrialized world. AIDS will become, if it is not already, largely a disease of the poor and therefore of less interest to the rich and powerful.

The truth is that young people could be saved by using condoms. A condom costing as little as $0.03 – 3 US cents – seems a fragile barrier to hold a formidable virological foe at bay; but it is all we have, and must be used.

The unfair burden of gender

The discrimination against women that manifests itself throughout their lives begins almost from birth – in some cases even while they are still in the womb – but it becomes acute during the years of adolescence. Two centuries after the abolition of slavery in much of the world, women are still treated almost as slaves in many societies. Their chains are those of lack of education and access to fertility control, and of prejudice, discrimination and economic dependence.

As WHO's Global Commission on Women's Health forcibly points out, the adolescent girl is especially vulnerable to oppression and violence of all kinds because of her relative lack of power physically, socially and economically. She will often have lower status in the household, lower status in the workplace and less opportunity for education, training, employment and inheritance rights, all of which make for greater vulnerability. It is not just the overt acts of violence such as rape which are damaging and unquestionably underreported, but also the implicit threat of violence which may determine much of what she is obliged to do. Such violence breeds many problems, including damage to reproductive health, and has mental health consequences ranging from anxiety and sexual dysfunction to severe depression and suicide.

Tobacco, alcohol and other drugs

The seeds of unhealthy behaviour which will kill or handicap a person in adult life are laid in adolescence. Young people, because they are going through a stage of stress, experimentation and

The death toll from AIDS is expected to exceed 8 million by the year 2000.

often rebellion against parents, can be heavy users of alcohol and other drugs. In poor urban areas the sniffing of glue or paint thinners poses additional risks to health. Cigarette smoking will eventually kill 1 user in 2 and significantly shorten the lives of others. The vast majority of new smokers start in adolescence. There is growing evidence that young girls are taking up smoking. This poses an additional risk as tobacco can increase the risk of heart disease from the contraceptive pill, can cause pregnancy complications and can damage the cervix. There are high rates of smoking amongst young people in Europe, Latin America, Asia and parts of Africa (*Table 4*). Very few people take up the habit after the age of 20 or so. The sooner smoking starts, the greater is the loss of life expectancy, and the harder it is to stop. Peer group influence and advertising pressure are sowing a bitter harvest of future ill-health and early death. UNCTAD estimates that since 1988 exports of manufactured tobacco have been increasing to match the growing demand, possibly fueled by advertising.

Table 4. Smoking habits of adolescents, selected countries

Country	Year	Age group	Regular smokers (%)	
			Male	Female
France	1990	12–18	49	40
Philippines	1987	15–19	38	38
Thailand	1991	15–19	23	1

Street children

Particularly in the megacities of the developing world, large numbers of children live and work on the streets, a high proportion without any family support. They are at high risk of malnutrition, tuberculosis, STDs including HIV and AIDS, parasite and worm infections, and skin diseases. Both sexes are highly vulnerable to drug abuse, prostitution and criminal exploitation, and in some regions street children risk summary execution from death squads. Recent estimates place their number at as many as 100 million. There may be 40 million in Latin America, 25 million in Asia and 10 million in Africa, with about 25 million in other areas including the developed world. In 1993 WHO launched an innovative project to study the links between street children and substance abuse, carrying out interviews with 550 young people in 10 cities throughout the world. The study noted regular use of alcohol and other drugs by a major proportion of street children in all cities. The most widely used substances were those which were cheap and easily available including alcohol, tobacco, cannabis, glue, solvents and pharmaceuticals. The use of cocaine, heroin, amphetamines, combinations of drugs and drug injecting was also reported. Often the lives of street children are intimately entwined with the illicit drug industry. Street children are used in the production and marketing of cocaine and the trafficking of cannabis and heroin.

Most street children describe major losses in their lives. Many have lost family members through diseases such as AIDS, natural disasters and murder. In Rio de Janeiro (Brazil) 55% of those interviewed said they had attempted to take their own lives.

Although poverty and rapid urbanization are major contributing factors to the problem of street children, many claim that physical and sexual abuse were the reasons for their leaving home. Many too are below the age of consent, do not have parents or guardians, do not know a trusted adult who could accompany them for medical treatment and do not have the necessary documentation.

There are particular problems in the provision of health and welfare services to street children with regard not only to health care but also to housing, welfare benefits, educational opportunities and employment. After being turned away from different services on many occasions, and having no adults to speak for them, the children consider it is pointless to try again even when they are in great need.

Child labour

Surveys by ILO in 1990 found that over 79 million children under the age of 15 were obliged to work. In some cases children as young as 5 years have been reported as being in paid employment. Africa and Asia dominate the data on child labour. These two regions account for 70% of the countries and 94% of the working children in a survey of more than 100 countries carried out in 1992. In Asia 15% of children aged 10-14 were working, and 22% in Africa.

Children are in particular danger from unsafe and often illegal working conditions and from exposure to hazardous chemicals, industrial acids, solvents and heavy metal fumes. Children, some as young as 6 years, labour for long hours for a half or a third of the adult wage. In the fields most work barefoot, and are thus exposed to parasites and other diseases. Many are undernourished and thus particularly vulnerable to the effects of pesticides.

In addition to paid employment, millions of children are required to do unpaid family labour, often in gruelling agricultural conditions, from hoeing and weeding to spreading pesticides and harvesting crops. Girls labour at home cleaning, cooking, fetching water and feeding domestic animals. Even small children gather firewood and parents who do not need their children's labour may hire them out to neighbouring farmers.

Accidents, violence and suicide

Between the ages of 5 and 14, injuries account for more than a fifth of deaths of boys and a seventh of deaths of girls in the developing world. In developed regions, although the number of deaths is smaller, 57% of male deaths and 43% of female deaths in this age group are due to injuries, mainly traffic accidents and drowning.

There is growing concern about the numbers of young people who die as the result of violence, and the number who are taking their own lives. Young people are increasingly victims of violence and are themselves physically aggressive towards others. Every day in the USA 9 people under the age of 18 are murdered. Adolescents are twice as likely as adults to be the victims of crime, and 10 times more likely than elderly people.

There seems to be a worldwide trend of increasing violence. Poverty, unemployment, overcrowding and reduced control over the upbringing of young people are key factors. So too are drug and alcohol abuse, frequent exposure to violence on the streets and on television and for many a sense of failure, frustration and hopelessness.

That these last three emotions are widespread and profound among young people is beyond doubt, and tragically reflected in evidence that suicide rates among young people appear to be rising in both developed and developing countries more quickly than in all other age groups. In most countries suicide is second only to accidents as a leading cause of death among the young. Young men commit suicide much more often than young women who, however, attempt suicide with much greater frequency. The ratio of attempted suicide to completed suicide among adolescents has been estimated at 40 to 1 in most industrialized countries. If so many of today's young have already run out of hope, the challenge for adult society is to persuade them that life is worth living.

Suicide rates among young people appear to be rising in both developed and developing countries more quickly than in all other age groups. If so many of today's young have already run out of hope, the challenge for adult society is to persuade them that life is worth living.

Health of adults

Disease patterns

In terms of disease mortality, infectious and parasitic diseases are the biggest group of killers on the planet. As far as specific causes are concerned, diseases of the circulatory system – heart attacks and stroke – are the largest single cause of death.

Globally about 51 million people of all ages died in 1993. Some 39 million deaths took place in the developing world and about 12 million in the developed. Poor countries had three times more deaths than rich ones. Some caution is necessary in interpreting mortality figures, since reliable data on causes

Table 5. Global health situation: mortality, morbidity and disability, selected causes, all ages, 1993 estimates[a]

ICD-9 code	Diseases/conditions	Deaths	Cases		Disabled persons
			Prevalence	Incidence	(permanent and long-term)
		(000)	(00 000)	(00 000)	(00 000)
	All causes	**51 000**			
	Infectious and parasitic diseases (selected), of which:	***16 445***			
480-486	Acute lower respiratory infections under age 5	4 110	...	2 483[b]	...
009	Diarrhoea under age 5, including dysentery	3 010[c]	...	18 210[b]	...
010-018	Tuberculosis	2 709	200	83	...
084	Malaria	2 000	4 000	...	...
055	Measles	1 160	...	452	...
070.2, 070.3	Hepatitis B	933	43	22	...
033	Whooping cough	360	...	431	...
320	Bacterial meningitis	210	12	...	1.9
120	Schistosomiasis	200	2 000	...	...
085	Leishmaniasis	197	127	72	...
090	Congenital syphilis	190	...	...	...
037	Tetanus	149	...	3.0	...
126	Hookworm diseases (ancylostomiasis and necatoriasis)	90	960	...	...
006	Amoebiasis (*entamoeba histolytica*)	70	480	...	...
127.0	Ascariasis (roundworm)	60	2 140	...	...
086.3-086.5	African trypanosomiasis (sleeping sickness)	55	2.7	0.6	...
086.0-086.2	American trypanosomiasis (Chagas disease)	45	170	4.0	...
125.3	Onchocerciasis (river blindness)	35	176	...	2.7
036.0	Meningitis (meningococcal)	35	3.5	...	0.5
071	Rabies	35	...	...	...
060	Yellow fever	30	...	2.0	...
061.065.4pt.	Dengue/dengue haemorrhagic fever	23	...	5.6	...
062.0	Japanese encephalitis	11	...	0.4	0.1
121pt.	Foodborne trematodes	10	...	...	...
001	Cholera (officially reported figures only)	6.8	...	3.8	...
045	Poliomyelitis	5.5[d]	...	1.1	100
032	Diphtheria	3.9	...	0.8	...
030	Leprosy	2.4	24	6.0	25
020	Plague	0.5	...	0.05	...
125pt.	Lymphatic filariasis	...	1 000	...	430
127.3	Trichuriasis (whipworm)	...	1 330	...	...
007.1	Giardiasis	...	...	5.0	...
131	Trichomoniasis	...	2 360[e]	940[e]	...
099pt.	Chlamydial infections (sexually transmitted)	...	1 620[e]	970[e]	...
078.1pt.	Genital warts	...	...	320	...
098	Gonococcal infections	...	720[e]	780[e]	...
054.1	Genital herpes	...	...	210	...
091-097	Other syphilitic infections	...	530[e]	190[e]	...
099.0	Chancroid (*haemophilus ducreyi*)	...	90[e]	90[e]	...
102,103	Endemic treponematoses	...	20	2.0	2.0
125.7	Dracunculiasis (guinea-worm disease)	...	30	20	...
279.5, 279.6	AIDS	700	10	6.2	...
795.8	*HIV (seroprevalence)*	...	*140*	...	...
	Perinatal and neonatal causes (selected), of which:	***3 180***			
768	Birth asphyxia	840	...	...	...
740-759	Congenital anomalies	660[f]	...	36	...
771.3	Neonatal tetanus	560	...	6.7	...
767	Birth trauma	420	...	...	...
764-765	Prematurity	410	...	...	...
771pt.	Neonatal sepsis and meningitis	290	...	...	...
	Maternal causes (selected), of which:	***508***			
640, 641, 666	Haemorrhage	126	...	143	3.7
647,648	Indirect causes	101	...	135	...
670	Sepsis	75	...	120	61
630-639	Abortion	67	...	199	48
642	Hypertensive disorders during pregnancy	62	...	71	0.7
643-646, 651-665, 667-669, 671-676	Other direct obstetric causes	39	...	36	...
660	Obstructed labour	38	...	73	70
	Diseases of the circulatory system (total), of which:	***9 676***			
410-414	Ischaemic heart disease	4 283	...	...	...

ICD-9 code	Diseases/conditions	Deaths	Cases		Disabled persons
			Prevalence	Incidence	(permanent and long-term)
		(000)	(00 000)	(00 000)	(00 000)
430-438	Cerebrovascular disease	3,854	...	...	...
415-429	Other heart diseases[g]	1 133	...	...	...
390-398	Rheumatic fever and rheumatic heart disease	406	...	...	...
401-404	Hypertensive disease	...	4 906	...	...
	Chronic lower respiratory diseases (total), of which:	***2 888***			
491pt., 492,496	Chronic obstructive pulmonary disease	2 888	6 000	...	...
493	Asthma	...	2 750	...	...
	Malignant neoplasms/cancer (total), of which:	***6 013***	***200***	***90***	
162	Malignant neoplasm of trachea, bronchus and lung	1 035	...	...	...
151	Malignant neoplasm of stomach	734	...	...	...
153-154	Malignant neoplasm of colon and rectum	468	...	...	...
140-149	Malignant neoplasm of lip, oral cavity and pharynx	458	...	...	...
155	Malignant neoplasm of liver	367	...	...	...
174	Malignant neoplasm of female breast	358	...	...	...
150	Malignant neoplasm of oesophagus	328	...	...	...
180	Malignant neoplasm of cervix	235	...	...	...
200-202	Lymphoma	221	...	...	...
157	Malignant neoplasm of pancreas	214	...	...	...
204-208	Leukemia	207	...	...	...
185	Malignant neoplasm of prostate	182	...	...	...
188	Malignant neoplasm of bladder	135	...	...	...
183.0	Malignant neoplasm of ovary	123	...	...	...
182	Malignant neoplasm of corpus uteri	64	...	...	...
172	Malignant melanoma of skin	37	...	...	...
	Other malignant neoplasms	853	...	...	...
	External causes (total), of which:	***3 996***			
E880-E915	Falls, fires, drowning, etc.	1 810	...	...	...
E810-E829	Motor- and other road-vehicle accidents	885	...	99	...
E950-E959	Suicide	779	...	...	...
E960-E969	Homicide and violence	303	...	86	...
E916-E928	Occupational injuries due to accidents	220	...	1 200	10
	Occupational diseases	...	...	690	...
	Mental and behavioural disorders				
	Neurotic, stress-related and somatoform disorders	...	5 018	...	...
	Mood (affective) disorders	...	1 970	...	591
317-319	Mental retardation (all types)	...	826	...	413
345	Epilepsy	...	298	...	149
290	Dementia	...	224	...	112
295	Schizophrenia	...	158	...	79
	Other causes (selected), of which:	***170***			
250	Diabetes mellitus	170	600	...	...
286pt.	Haemophilia	...	3.9	0.2	...
240-242pt.	Goitre	...	6 550	...	...
282	Haemoglobinopathies	...	...	3.0	...
	Unknown causes	***8 124***			
	Disability (selected), of which:				
	Trachoma-related blindness	...	1 540	205	56
	Glaucoma-related blindness	...	201	33	51
	Cataract-related blindness	...	...	109	158
389	Hearing loss (41decibels and above) over age 3	...	...	...	420
	Alcohol and substance abuse (selected), of which:				
303	Alcohol dependence syndrome	...	...	115	...
304	Substance abuse (drug dependence syndrome)	...	...	94	...
304.3	Cannabis	...	273	...	...
304.2	Cocaine	...	94	...	...
304	Heroin	...	23	...	...

[a] Estimates for some diseases may contain cases that have also been included elsewhere; for example, estimates for acute lower respiratory infections and diarrhoea include those associated with measles, pertussis, malaria and HIV.
[b] Incidence figures refer to episodes.
[c] Deaths from dysentery are estimated at 450 000.
[d] Estimate based on case-fatality rate for paralytic cases only.
[e] Refers to maximum estimated value.
[f] Includes 440 000 deaths among children under age 5.
[g] This category includes heart failure, nonrheumatic endocarditis, diseases of pulmonary circulation, cardiac dysrythmias and other ill-defined conditions.
... Data not available or not applicable.

of death are available to WHO for only about 70 countries, which are mostly developed and account for some 40% of the world population. However, based on community studies, health service information and ad hoc surveys, an approximate distribution of deaths by cause can be made (*Table* 5).

Fig. 4. Global distribution of deaths by main causes, 1993

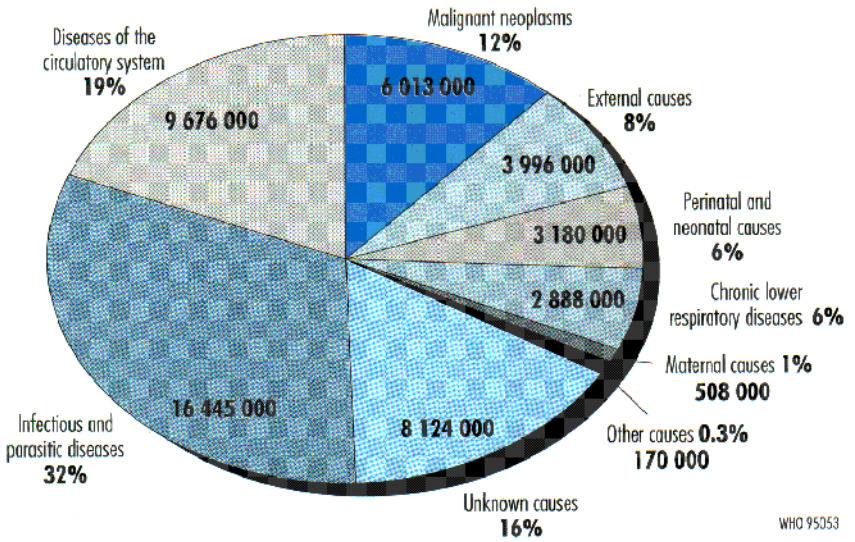
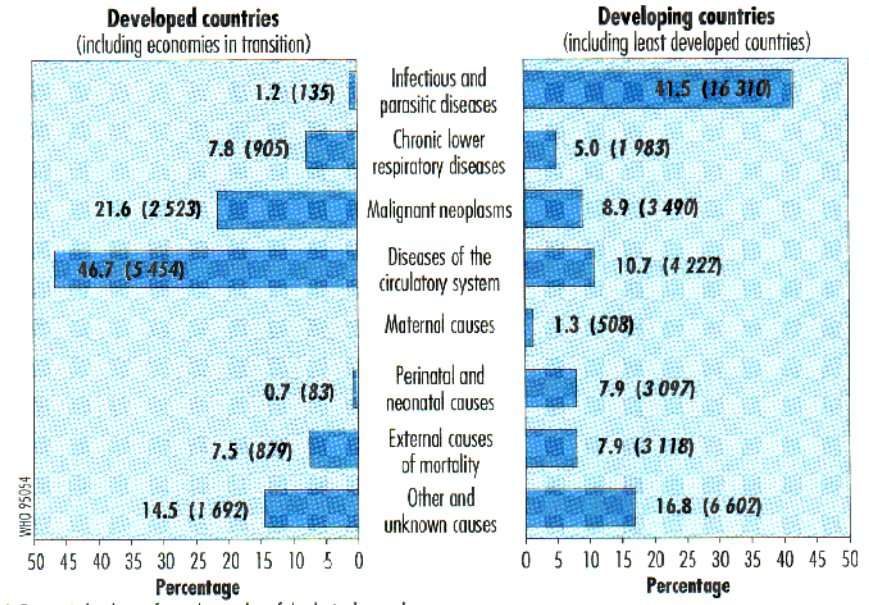


Fig. 5. Causes of death, 1993[a]



[a] Figures in brackets refer to the number of deaths in thousands.

Of the estimated 51 million deaths (*Fig. 4*):

- communicable diseases such as tuberculosis and respiratory infections as well as maternal, perinatal and neonatal causes account for about 20 million, or 40% of global deaths, and 99% of these occur in the developing world;
- noncommunicable diseases such as cancer and heart disease account for about 19 million, or about 36% of the total, with both the developing and the developed world sharing the burden more or less equally;
- external causes such as accidents and violence account for about 4 million, or about 8% of the total, developing countries having nearly four times the number of deaths from these causes as the developed world;
- other and unknown causes account for the remaining 16% of global deaths.

The difference between infectious and noncommunicable diseases is very marked. One in 2 deaths in the developing world is due to communicable disease, including maternal and perinatal causes, but in the developed world 3 out of every 4 deaths are due to noncommunicable diseases, many of which are lifestyle-related (*Fig. 5*).

The big killers

Of the 20 million deaths due to communicable diseases more than 16 million, or about 80%, are due to infectious and parasitic diseases. Tuberculosis kills about 3 million people, malaria around 2 million and hepatitis B possibly 1 million. Maternal complications claim another 508 000 lives per year.

Noncommunicable diseases are also emerging as a major cause of death in the developing world. Diseases of the circulatory system account for 10 million deaths globally of which heart disease claims more than 5 million lives and cerebrovascular disease (such as stroke) another 4 million. About 44% of the 10 million deaths from diseases of the circulatory system occur in the developing world. Cancer accounts for

6 million or 12% of deaths globally – some 58% of them in the developing world. Cancers of the airways and lungs, mostly caused by cigarette smoking, are the leading cause with 1 million deaths, followed by cancer of the stomach with over 700 000 deaths. Respiratory diseases such as chronic bronchitis kill 3 million people a year.

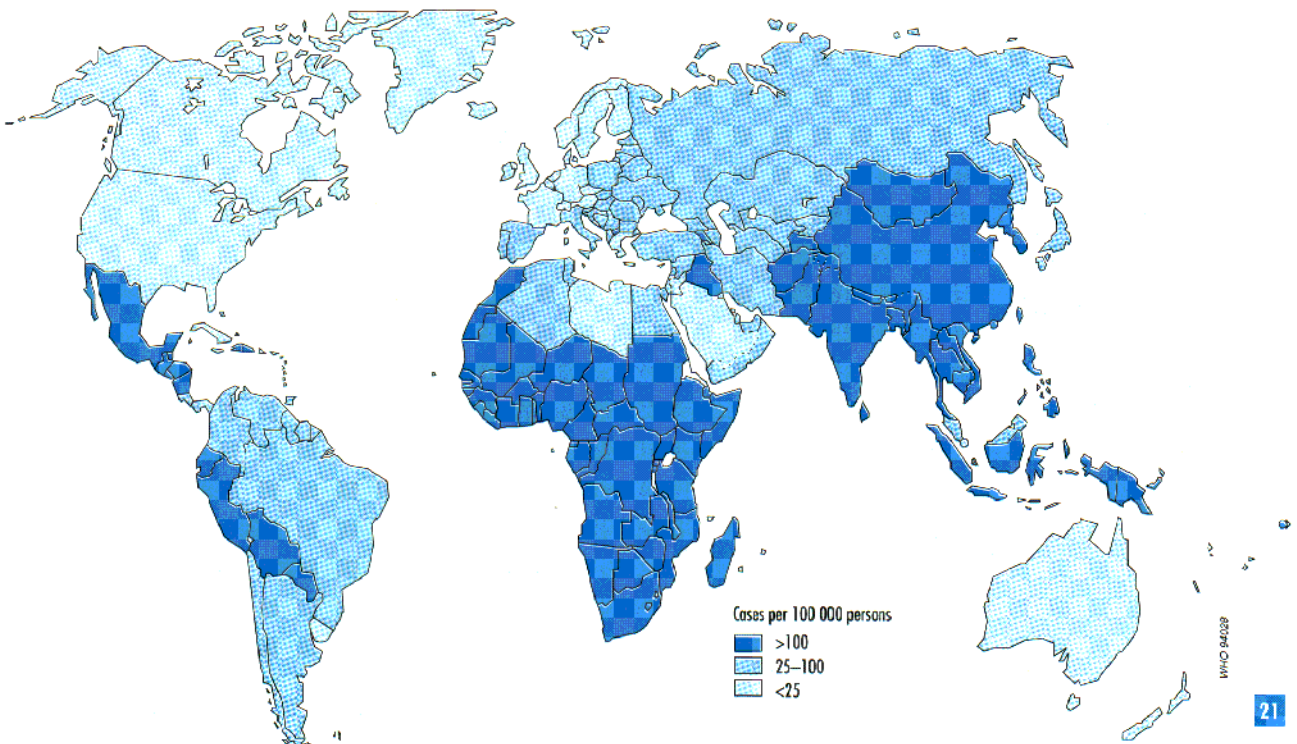
It is estimated that ***tuberculosis*** killed some 3 million people in 1993, representing more than 5% of deaths globally. There will be an estimated 8.8 million new cases in 1995. This corresponds to 52 000 deaths from the disease per week – or over 7 000 each day and over 1 000 new cases every hour of every day. Some 80% of victims are in the economically productive age group 15-49 years.

However, mortality figures, and even the number of new cases, give no real idea of the global burden of tuberculosis. Long considered a disease of the past, it has now emerged as a major public health threat and in April 1993 WHO declared it a global emergency. Some 95% of sufferers live in the developing world (*Map 2*). Tuberculosis largely affects poor people and is growing in industrialized countries.

Tuberculosis is transmitted by bacteria spread into the air when a patient with the active illness coughs or sneezes. An estimated 2 billion people carry the causative organism *Mycobacterium tuberculosis*. Most healthy people who are infected keep it in check through the strength of their immune system. The analogy of a cobra in a basket with the lid closed has been used to describe the process. When the immune system weakens through disease such as cancer or HIV or though malnutrition or old age, the lid is lifted off the basket and the cobra emerges. Once infected, a person risks developing active tuberculosis, and the risk persists throughout life. Up to 10% of those who carry the bacterium go on to develop the active form of the disease.

Drug treatment – in most cases costing as little as $13-30 per person for a six-month course – can effect a cure and stop the person being contagious. Treatment, however, requires people to take the drugs for at least six months without interruption. This is perhaps the greatest challenge to control. Many patients feel better after a few weeks and stop taking their drugs, although they are not cured and risk having a

Map 2. Estimated tuberculosis incidence, 1990



recurrence and continuing to spread the disease. Worse, they risk developing and spreading a drug-resistant strain which is vastly more difficult and expensive to cure. Poorly managed tuberculosis programmes can thus have disastrous consequences.

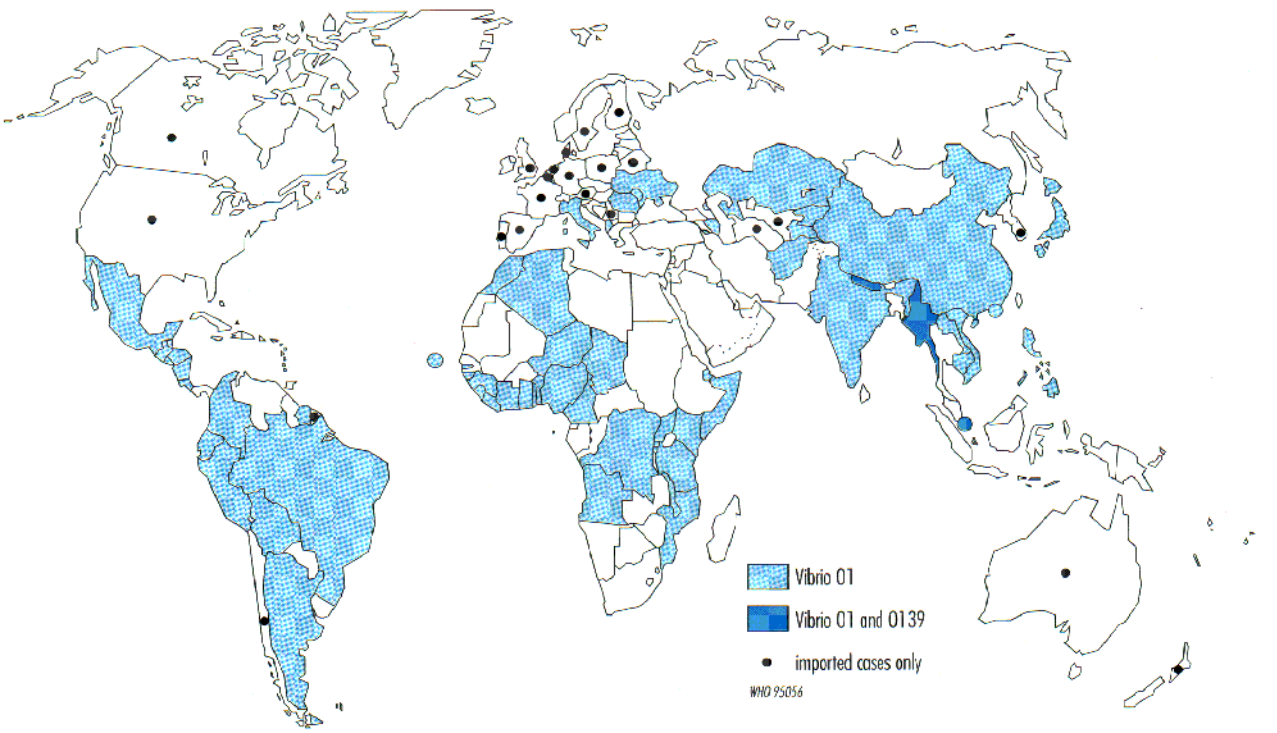
BCG vaccine, developed in 1921 and still the only vaccine against the disease, is effective in protecting infants from severe forms of childhood tuberculosis. For reasons not clearly understood, it provides relatively little protection in adolescents or in adults.

HIV damages the immune system and accelerates the speed at which tuberculosis progresses from a harmless infection to a life-threatening disease – changing a process that can take years into one that happens within weeks. It may also make those who are uninfected by the tuberculosis bacterium much more vulnerable to this infection. The lethal relationship may also work the other way – tuberculosis may hasten the progress of HIV into AIDS.

The consequences of this relationship are already apparent. In sub-Saharan Africa at least 3.8 million people are infected with both tuberculosis and HIV. Asia – where 1.1 billion people suffer from tuberculosis and the number of HIV cases is rising dramatically – faces a devastating explosion of AIDS-related tuberculosis. The number of co-infected people in Asia is expected to multiply sevenfold this decade. Most will be economically productive young people aged between 20 and 49. During the next 10 years in Asia alone it is estimated that tuberculosis and AIDS together will kill more people than the entire populations of the cities of Singapore, Beijing, Yokohama and Tokyo combined.

There is every moral and practical justification for providing tuberculosis treatment in these circumstances. Treatment prevents tuberculosis being passed on. If it is denied, not only will children find themselves without one or both parents, they will discover they have been given the disease by them and are themselves at risk of an early death.

Map 3. Countries or areas reporting cholera, 1994



Currently WHO estimates that only 30% of all national tuberculosis programmes are applying the measures required to control the epidemic and that in order to undertake successful tuberculosis programmes an additional $100 million per year needs to be provided each year by donor nations to poor countries for medicines, microscopes and a modest infrastructure. Meanwhile low-cost drugs which are almost 100% effective sit on shelves unused.

Cholera has become endemic in many countries in Africa, Asia and Latin America (*Map 3*). In 1993 there were 377 000 new cases reported and 6 800 deaths. The global case fatality rate is currently about 1.8%, which is much lower than previous values due to simple, cheap and effective case management promoted by WHO. The total number of cases officially reported to WHO declined from a peak of around 600 000 in 1991. Nevertheless the numbers of cases and deaths remain at far higher levels than those reported earlier. The largest decline in incidence between 1992 and 1993 was seen in the Americas, which since 1991 had been the source of most reports. Africa continues to report a considerable number of cases and deaths, accounting for about 25% of the global total in 1993 (see also *Box 6*). In Asia officially reported cases more than doubled between 1992 and 1993, with a large outbreak in war-torn Afghanistan accounting for a substantial part of the increase.

Complicating the situation in Asia was the emergence in late 1992 of a new causative organism, designated *Vibrio cholerae O139* (Bengal). This strain has spread very rapidly through Bangladesh, China, India, Malaysia, Nepal and Pakistan and has caused unusually high mortality, even in adults. Previous exposure to *Vibrio cholerae O1* (El Tor), the classical cholera strain since the mid-1960s, does not provide protective immunity against the new organism.

Malaria is by far the most important tropical parasitic disease, causing immense suffering and loss of life. The enormous toll of lives and of days of labour lost, and the costs of treatment, make malaria a major social and economic burden in developing countries. The estimated direct and indirect cost of the disease in Africa alone is expected to have reached $1.8 billion by 1995.

Malaria is caused by four species of protozoal parasites of the genus *Plasmodium*. Of these, *P. falciparum* accounts for most of the infections in Africa and for over a third of infections in the rest of the world. Falciparum malaria is the most dangerous form of the disease, sometimes progressing to cerebral oedema, coma and death.

There are an estimated 2 million deaths a year, 90% in Africa and the vast majority among young children. Outside Africa two-thirds of the reported cases are concentrated in only 6 countries, namely in decreasing order: India, Brazil, Sri Lanka, Afghanistan, Viet Nam and Colombia. Around the world more than 2 billion people are threatened.

The global malaria control strategy adopted in 1992 emphasises early diagnosis and treatment of the disease with effective antimalarial drugs, selective application of preventive measures including vector control where the results are cost-effective and sustainable, the detection, prevention and control of epidemics and the continuous review of the local malaria situation so that control measures can be adapted as necessary.

Box 6. Cholera outbreak in Goma (Zaire)

July 1994 saw a large and dramatic outbreak of cholera in camps in Goma (Zaire). The rapid influx of an estimated 700 000 to 1 million Rwandan refugees to the city of Goma and surrounding areas resulted in massive overcrowding without basic sanitation or safe water, creating ideal conditions for rapid spread of the disease. On the basis of epidemiological surveillance, it was estimated that 70 000 cases of diarrhoeal disease, including many cholera cases, occurred in Goma between 20 July and 12 August 1994.

Despite the suddenness and size of the outbreak, case fatality decreased from 24% during the first days of the epidemic to 3-5% with the establishment of rehydration units and the distribution of safe water.

There was a strong response to the outbreak by the international community. WHO played a crucial role in providing technical advice on cholera and dysentery control to relief agencies working in the refugee camps, thus ensuring a concerted international effort. Teams were sent from WHO headquarters and the Regional Office for Africa to assist in the work.

The ancient scourge of leprosy still causes 600 000 new cases a year. Between 2 and 3 million people are disabled by the disease.

Although the geographical area affected by the illness has shrunk dramatically over the past 50 years, gains are being eroded (*Maps 4A & 4B*). Control is becoming increasingly difficult, manifestations of the disease appear to be more severe than in the past, and there is a growing problem of drug resistance.

Malaria is treated with a number of drugs, used either together or singly depending on the resistance of the parasite. Treatment costs are in the range of $3.50-12.50 per person per year. Chloroquine was until recently the drug of choice in Africa, but resistance is beginning to compromise its use there. New drugs have been developed, but resistance to some of these is being reported at an alarming rate. Moreover improvements in malaria control face formidable challenges in many areas where there is a lack of basic health care infrastructure. Three main types of vaccine that may contribute to the control of malaria are currently under development as described in *Chapter 2*. Recent findings indicate that there are good prospects of having a vaccine before the end of the decade.

The spread of malaria is linked to activities such as road building, mining, logging and new agricultural and irrigation projects. It is a particular problem in "frontier" areas such as Amazonia. Malaria is not only a devastating disease for the individual, but a social condition closely related to economic development and in many cases an important obstacle to development.

Other communicable diseases

Dengue and ***dengue haemorrhagic fever*** are now the most important and rapidly rising arbovirus infections in the world. They are mosquito-borne diseases related to yellow fever. There are four distinct dengue viruses, with no cross-immunity between them, so that an individual who has recovered from one remains susceptible to the other three. It is even thought that a previous infection makes people more susceptible to serious complications or to subsequent infections. The breeding habits of the main mosquito vector, *Aedes aegypti*, are closely related to poor sanitation or overcrowding and incorrect water storage.

Although debilitating symptoms and death are inflicted on all social strata, dengue frequently affects the very young and the elderly. There are millions of cases annually, with more than 500 000 people needing hospital treatment, and thousands of deaths. Dengue has recently caused massive epidemics in Africa, the Americas, Asia, the Pacific islands and in some countries of the Eastern Mediterranean. From 1955 to 1970 only 9 countries reported epidemics of dengue haemorrhagic fever. Between 1970 and 1993, however, a further 28 countries were affected.

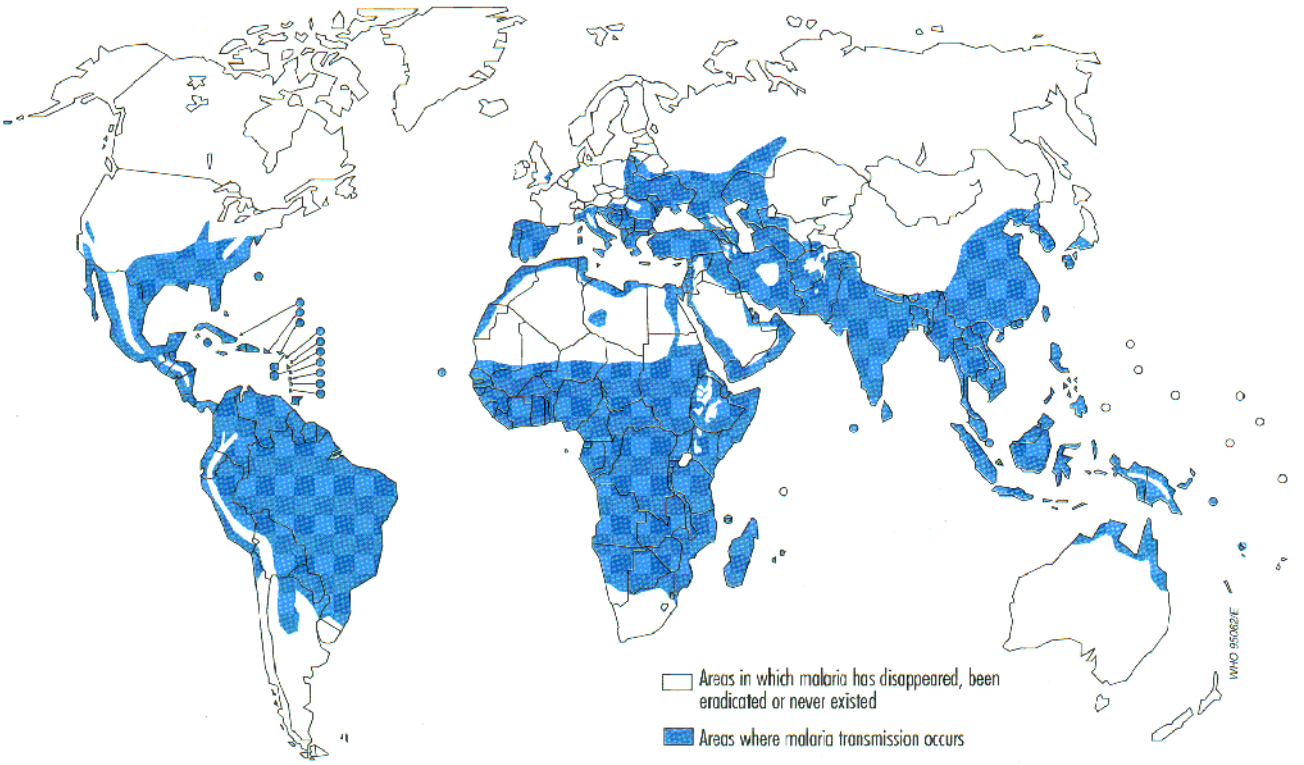
If diagnosed and treated early, mortality from dengue haemorrhagic fever is less than 5%; otherwise it can be 30%. But in many countries clinicians do not recognize symptoms, laboratories are not equipped for diagnosis, diagnostic kits are not available and vector control programmes are insufficient.

The ancient scourge of ***leprosy*** still causes 600 000 new cases a year. Between 2 and 3 million people are disabled by the disease, including those who have been cured but crippled in some way prior to treatment. It affects 79 countries but the majority of victims are in India, Myanmar and Brazil (*Maps 5A & 5B*).

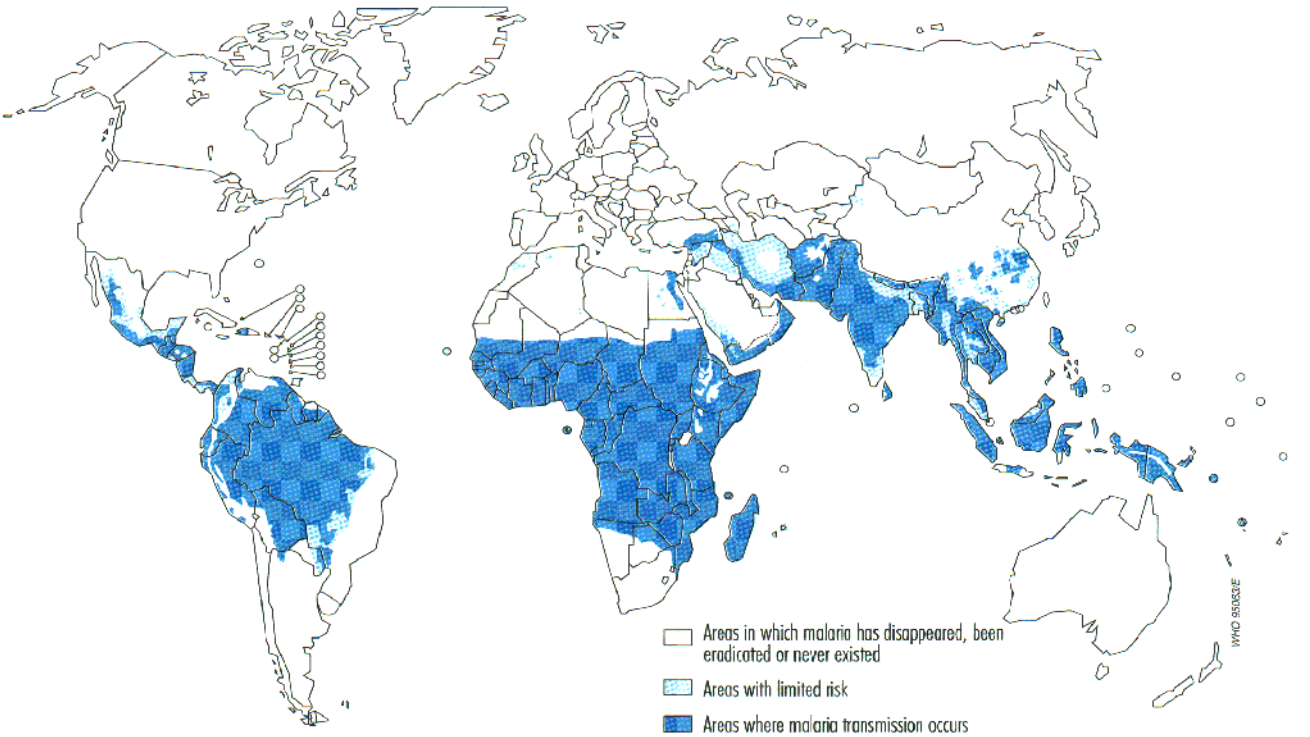
The route of infection is thought to be coughing and sneezing, but transmission is very inefficient. Of those infected with the slow-growing leprosy bacillus, few develop the disease. Of the estimated 2.4 million sufferers, 1.7 million are known and receiving treatment.

Dapsone, the first really effective drug against leprosy, was used on a large scale from the 1950s onwards, but widespread resistance soon developed. Later, new effective drugs were synthesized. Use of a combination of three different drugs was shown to be very effective, because the likelihood of a bacterium being resistant to all the three at the same time is practically nil. This multidrug therapy developed and promoted by WHO is successful in curing the disease and making patients non-infectious. If such treatment can be made available to all patients, there is

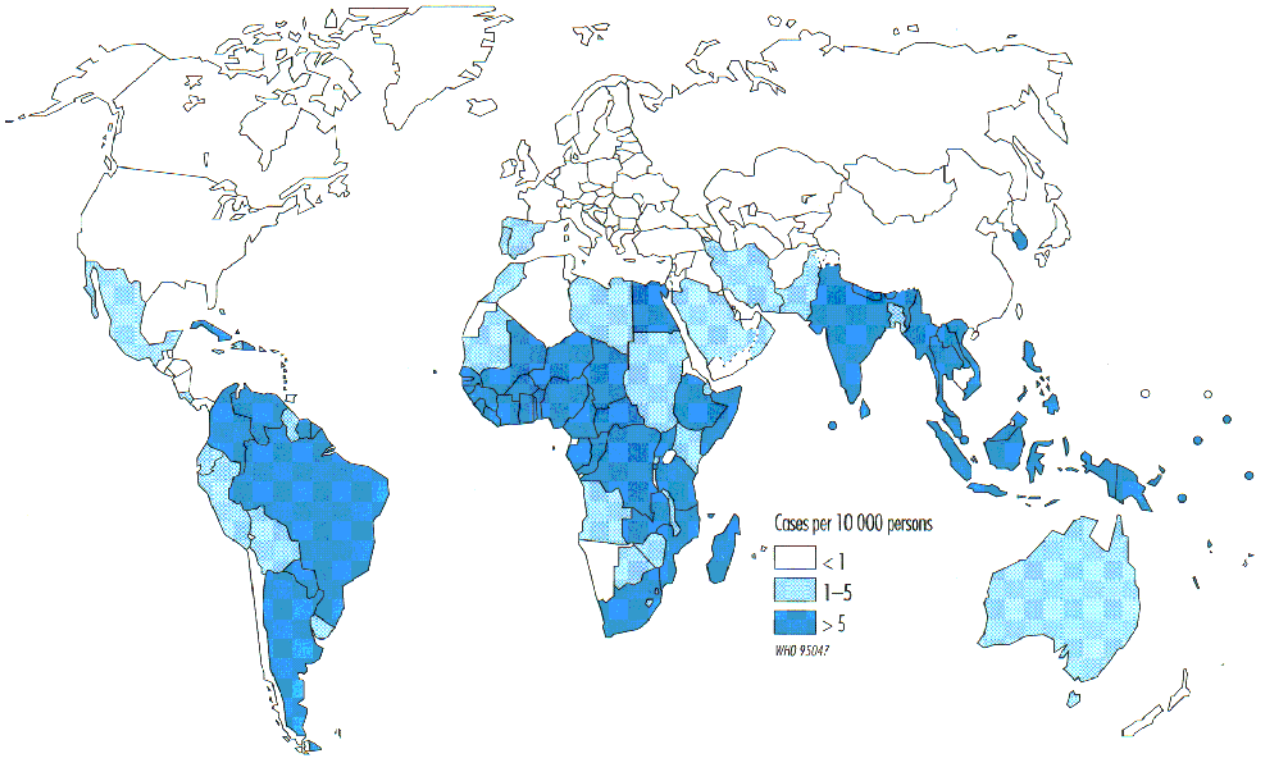
Map 4A. Geographical distribution of malaria before 1946



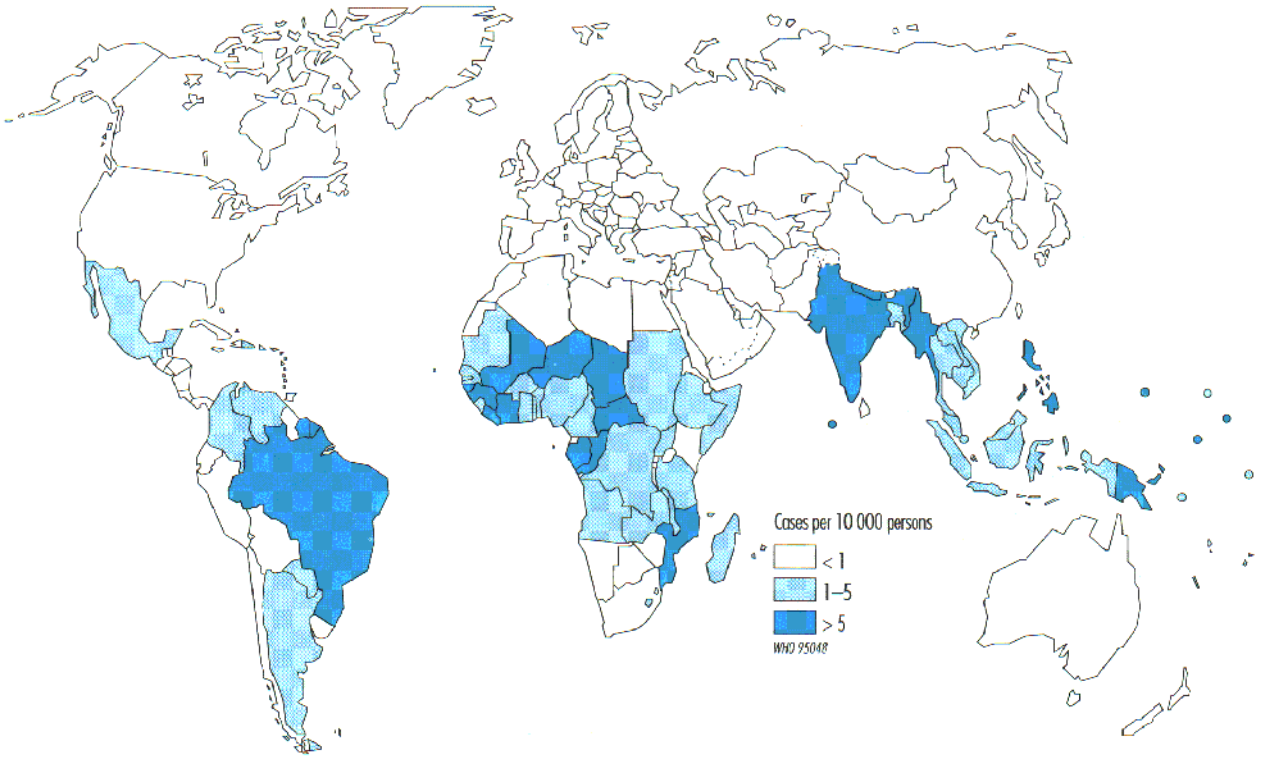
Map 4B. Epidemiological status of malaria, 1994



Map 5A. Registered leprosy cases in the world, 1985



Map 5B. Registered leprosy cases in the world, 1994



hope that the WHO target of eliminating leprosy as a public health problem can be reached.

Onchocerciasis (river blindness) infects 18 million people in 34 countries mainly in western Africa, but also in Yemen and Latin America. Some 300 000 people have been blinded by the disease. In the west African savanna, where the parasite strain is most pathogenic to the eye, 1 in 10 people risked blindness before the disease was brought under control. In addition to causing around 40 000 new cases of blindness each year, it also provokes severe itching as well as disfiguring skin disease. WHO has shown that one tablet a year of the drug ivermectin can prevent the disease. The drug has been provided free of charge to the programme by its manufacturer Merck & Co, and is currently being taken by more than 2.5 million people a year. However, many of the most affected communities are located in remote areas and are hard to reach. As a result, the disease remains a major health concern in Cameroon and Nigeria among others.

Dracunculiasis (guinea-worm disease) causes dreadful suffering and disability among the world's most deprived people. Nine out of ten people living in the depressed areas of Africa south of the Sahara and of the Indian subcontinent still have nothing else to drink but meagre quantities of impure water, thus exposing themselves to infection.

The parasitic worm, 20-30 inches long, which causes dracunculiasis, migrates through the victim's body and eventually emerges causing intense pain, a blister and then an ulcer. The disease reappears each year during the agricultural season, handicapping farmers, mothers and schoolchildren already subject to harsh living conditions. Families affected by the disease experience great loss as their food stocks and savings dwindle. Gradually worn down by penury, these underprivileged people find themselves trapped in a vicious circle of poverty and disease.

Chagas disease affects 17 million people in 21 countries in Latin America and causes 45 000 deaths and 400 000 cases of heart and stomach disease annually. With WHO support, the six countries of the Southern Cone of the Americas – Argentina, Bolivia, Brazil, Chile, Paraguay and Uruguay – plan to eliminate the disease as a public health problem by the year 2000 using WHO-developed community-based insecticidal paints, fumigant canisters to destroy the insect vectors as well as detection boxes to verify the effectiveness of the control measures. Better diagnostic kits have been developed and blood screening improved. There is currently no effective drug for treatment of chronic infections, but two new products are on trial.

African trypanosomiasis (sleeping sickness) is transmitted by tsetse flies and is fatal if untreated. It kills an estimated 55 000 people a year, and sometimes erupts into widespread epidemics, as in Zaire in 1994.

WHO supported the application of the first new drug against the disease in 40 years – eflornithine – which is so effective it has been dubbed the "resurrection drug". However, treatment costs some $500 and is therefore beyond the reach of most affected countries without substantial subsidies.

Schistosomiasis (bilharziasis or snail fever), a water-related parasitic infection, affects 200 million people in 74 countries in the Americas, Africa and Asia and kills perhaps 200 000 people. Its effects include long-term, painful, swollen internal organs, anaemia, severe weakness and eventually permanent organ damage.

The disease mainly affects rural people engaged in agriculture or fishing. However, increased population movements have led to its introduction into a growing number of urban areas in northwest Brazil and Africa, and in refugee settlements. Similarly irrigation projects in many countries, in particular the building of dams, have resulted in an explosion of the snail population which harbours the parasites, and caused the disease to spread. Thus in addition to its toll of deaths, the disease hinders development and severely reduces the work capacity of many farmers and others.

Onchocerciasis has been brought under control in 11 countries through a massive WHO-administered programme against the blackfly vector.

WHO estimates that one-quarter of the world's population is subject to chronic intestinal parasitic infections which have insidious effects on growth, nutrition and cognitive function in children, and on the development of girls and women.

Safe and effective drugs such as praziquantel are available, but their cost – although as little as $0.30 to treat one patient – prevents their widespread use which could allow control of the disease. At the request of Kenya, Malawi, Nigeria and Zambia, which together have more than 30 million infected people, WHO has succeeded in negotiating a reduction in the price of the drug with the manufacturers.

The potential population at risk of ***leishmaniasis*** is put at some 350 million and about 13 million people are infected. Transmitted by sandflies, the leishmaniases are a complex of parasitic diseases with a wide range of clinical symptoms. Visceral leishmaniasis, also known as kala-azar, is the most severe form and is nearly always fatal if untreated. It caused some 500 000 cases and more than 80 000 deaths in 1992. Cutaneous leishmaniasis, also known as oriental sore, causes some 1.5 million cases a year.

The disease is mostly rural, but is moving into a number of Latin American cities. Some 90% of the visceral cases occur in Bangladesh, India, Nepal and Sudan. Epidemics in India and Sudan in 1992 claimed most of the victims. About 90% of cutaneous cases occur in Afghanistan, Brazil, Islamic Republic of Iran, Peru, Saudi Arabia and Syria. Resistance is increasing so that cheaper, more easily administered drugs are needed.

Lymphatic ***filariasis*** is transmitted by mosquitos carrying the filarial parasite. It infects around 100 million people, 45 million of whom are in India. The disease leads to elephantiasis where the legs become grossly swollen and infected with sores, a debilitating condition with serious economic and social consequences, affecting many young working adults of both sexes. Patients are often shunned and isolated because of their disfigurement.

Drug therapy supplemented by vector control can be used to fight the disease. The main drug used for treatment is diethylcarbamazine (DEC) given once yearly, and costing around $0.10 per person. Part of the problem with control of the disease is that in many areas where it is endemic, it is not seen as a public health priority. China has seen a dramatic reduction in infection levels during the past decade. In India and Africa, which together account for 90% of all cases, there has been no decline in filariasis infection during the past 10 years and in several areas there has even been an increase.

WHO estimates that one-quarter of the world's population is subject to chronic ***intestinal parasitic infections*** which have insidious effects on growth, nutrition and cognitive function in children, and on the development of girls and women. Most of those affected live in developing countries. *Ascaris* causes clinical symptoms in as many as 214 million people, *Trichuris* in 133 million and hookworm in 96 million. Incidence of giardiasis is around 500 000 per year and prevalence of *Entamoeba histolytica* infection around 50 million.

Although mortality from intestinal parasites is low, the absolute number of deaths is fairly high because so many people are infected. It is estimated that in 1993 hookworm killed 90 000 people, *Entamoeba histolytica* 70 000 and *Ascaris* 60 000. The infections are spreading rapidly in slums, shanty towns and squatter settlements, a trend that is likely to continue with increasing and unplanned urbanization.

The consequences of manifestations of *Ascaris*, *Trichuris* and hookworm are promptly reversed by treatment with albendazole, levamisole, pyrantel and mebendazole. Mebendazole is produced at a substantially lower cost in generic form and is available at $0.027 per dose. Chemotherapy is part of a control strategy recommended by WHO which also includes health education and promotion of environmental health. Anthelminthics in single oral doses are also recommended for pregnant or lactating women.

Hepatitis B is the most deadly of the hepatitis group of virus diseases. It is a health concern particularly in Asia, sub-Saharan Africa and the Pacific basin. It is acquired from blood and body fluids of an infected person, usually through

sex or sharing injecting drug needles. It can also be passed on from mother to baby. Apart from producing a severe and sometimes fatal liver condition, hepatitis B is a major cause of liver cancer.

At least 350 million people are chronic carriers of the virus. One-quarter will die of liver cancer or cirrhosis of the liver. There are some 4.2 million acute clinical cases each year, sometimes involving jaundice and death of the patient. Hepatitis B is estimated to have killed around 1 million people in 1993. Some 10 000 of these deaths were from fulminant hepatitis, around 663 000 from liver cancer and 344 000 from cirrhosis.

By the end of 1994, 73 countries had started routine vaccination of infants against hepatitis B. One of WHO's vaccination targets is that all countries should integrate hepatitis B vaccination into their national immunization schedules by 1997. Sadly there is little chance that the target will be met, because adding this vaccine is likely to cost another $1.50 on top of the $1 for conventional childhood immunizations. The additional annual cost, with administration and delivery overheads, would be some $200 million. The world is not willing to find the sum, albeit modest.

As pointed out in the section on adolescent health, ***sexually transmitted diseases*** (STDs) impose a huge health burden across the world. Some 236 million people are estimated to have trichomoniasis, with 94 million new cases a year. Chlamydial infections affect some 162 million people, with 97 million new cases annually. There are an estimated 32 million new cases of genital warts each year and 78 million new cases of gonorrhoea. Genital herpes infects 21 million people each year, and syphilis 19 million. More than 9 million people are infected each year with chancroid.

Many, if not all, STDs could be avoided if condoms were used. Most STDs can be treated effectively and cheaply, the cost of treating genital ulcer disease, for instance, being between $0.5 and $4 per person. But there are problems in the supply and accessibility of services, compounded by fear of stigma by patients and the attitude of some service providers.

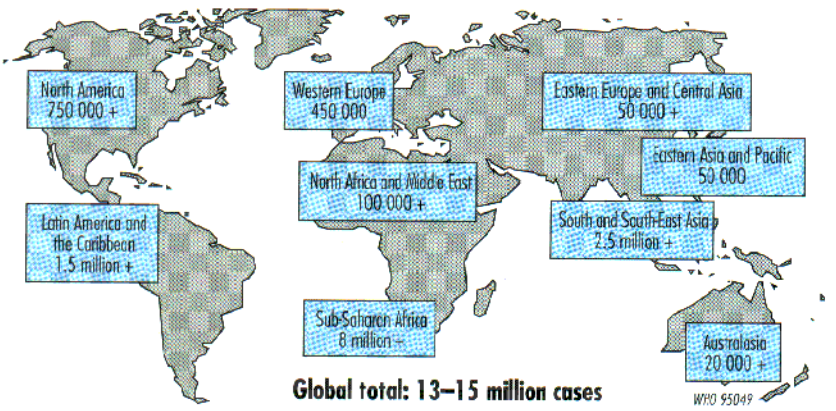
HIV and ***AIDS*** continue to spread relentlessly. WHO estimates that in 1994 HIV prevalence among adults worldwide was over 13 million (*Map* 6). Male homosexuals are still at risk, but worldwide most adults with HIV infection are heterosexual men and women. The virus also affects people injecting drugs and, decreasingly, those receiving infected blood and blood products.

Some 6 000 people are becoming infected each day. In parts of Africa and Asia the spread of the virus seems remorseless. In southern and south-eastern Asia HIV infections were estimated at 2.5 million – a million more than in 1993.

In parts of northern Thailand 20% of 21-year old military recruits and 8% of women attending antenatal clinics are infected, yet HIV was virtually unknown in the country in 1987. In India infection rates have tripled since 1992. In China there has been a steep rise in the number of reported STDs, showing how vulnerable that huge country is to the spread of HIV. The HIV infection rate in Asia went from 12% of the global total in 1993 to 16% in 1994.

Infections are spreading in northern Africa and the Near East. In Latin America and the Caribbean there have been an estimated 2 million infections, with a rapid increase in Brazil. Some

Map 6. Estimated distribution of HIV-infected adults alive (including persons with AIDS), late 1994



Global total: 13–15 million cases

By the year 2000 the cumulative total of HIV infections worldwide could reach 30-40 million.

1.5 million infections have occurred in northern America, western Europe and Australia. There is concern at the growing number of infections in eastern Europe and central Asia, where economic crisis, unemployment, armed conflicts and major population movements could all favour the spread of the virus.

In sub-Saharan Africa, the part of the world worst affected, the estimated total now exceeds 10 million infections, with slightly more women infected than men. In 1980 HIV appears to have affected just a few areas of Africa with a prevalence of less than 0.1%; it now exceeds 10% in a few countries. One study in Botswana found that between 16% and 24% of sexually active females were HIV positive. Another in Nigeria among STD patients found a 22% HIV positive rate.

By the year 2000 the cumulative total of HIV infections worldwide could reach 30-40 million. In addition to new infections there will also be a huge increase in the number of AIDS cases. It is estimated that 4 million adults and children have developed AIDS since the start of the pandemic. The cumulative total is projected to reach nearly 10 million by the year 2000.

Because of the age group affected, AIDS is having an economic impact out of proportion to the numbers of people dying. It causes illness, disability and death among employees and their families. Worker productivity declines, firms have higher medical costs and they eventually lose staff with valuable training and skills. At the same time, as more of the population becomes ill and personal income drops, consumer markets shrink. Recent reports suggest AIDS has so affected agricultural productivity in some areas that increasing mechanization will be needed to maintain and harvest crops.

The disease is having a dramatic impact on the costs of health services. In many urban hospitals of central and eastern Africa 50% or more of medical ward beds are occupied by AIDS patients. In Zaire a single admission to Kinshasa's main hospital for a child with AIDS costs the equivalent of several months of an average salary. Altogether, between 1992 and 2000, it is believed that the developing countries will be spending more than $1 billion on health care for AIDS patients.

In addition to their toll of death and bereavement and their vast economic burden, HIV and AIDS are inflicting untold damage in anxiety and worry.

In terms of prevention, condoms have been shown to make a difference. In Thailand STDs have fallen by 77% between 1986 and 1993. In Harare (Zimbabwe) STD rates decreased by 63% between 1990 and 1993 following condom promotion. In some groups reducing the number of sexual contacts and increasing the number of stable relationships have brought about a marked reduction in new infections. If sufficient effort is put into preventive work, encouraging changes in sexual behaviour can occur. AIDS, perhaps more so than any other disease, shows that behavioural scientists are as much needed as molecular biologists in the effort to slow the spread of the virus.

During the years 1979-1993 just over half the cases and 75% of the deaths from ***plague*** were in Africa. Three African countries registered plague in 1993 – Madagascar, Uganda and Zaire. Plague was also recorded in five Asian countries in 1993 – China, Kazakhstan, Mongolia, Myanmar and Viet Nam. Other cases were reported in Peru and the USA.

Plague is a disease of rodents and spreads from them to humans mainly by rat fleas biting first a sick rat and then a person, thus transmitting the bacillus of the disease, *Yersinia pestis*. Plague patients should be treated with antibiotic drugs such as streptomycin, kanamycin, chloramphenicol and tetracycline, which are effective provided they are used properly and in time.

The outbreak of plague in India in 1994 was a stern reminder to the world that a dreaded disease often regarded as a scourge of the past still exists. In 1993, 2 065 cases recorded in 10 countries, with 191 deaths, were notified to WHO. These figures were well above the annual averages (1 212 cases and 130 deaths) for the previous 10 years.

The Indian outbreak provoked unprecedented international concern about the disease, because of evidence that this was plague in its pneumonic form – which can be transmitted from person to person – rather than bubonic plague, which is more common but less infectious. This led a number of countries to impose restrictions on travel to and from India and many health authorities made provisions for quarantine measures. Among many other public health precautions, the Indian authorities introduced health checks for passengers departing on international flights.

In response to the outbreak, WHO issued travel advice based on the International Health Regulations, and set up an international team of experts which conducted a thorough investigation of the epidemic. The results suggested that a limited outbreak of pneumonic plague occurred in Surat, which many thousands of people had fled in panic, and involved far fewer cases than the number reported. No evidence was found of plague spreading outside Surat, and no imported, confirmed plague was detected in any other country.

Noncommunicable diseases

Diseases of the circulatory system killed an estimated 10 million people in 1993, or about 19% of the global total. In the developed world they claimed the lives of some 5.4 million people and were responsible for 47% of deaths. In the developing world they accounted for 4.2 million deaths, which although they constituted only 11% of all deaths in that part of the world, amounted to nearly as many as the number in the developed world.

In 1994 WHO published the world's biggest ever study on heart disease, covering 75 000 episodes in 1985-1987 among men and women aged 35-64. It found that the likelihood of heart attack was 12 times higher among men in North Karelia (Finland) than in Beijing (China), 9 times higher among women in Glasgow (United Kingdom) than women in Catalonia (Spain) and 7 times higher among women in Belfast (United Kingdom) than among the Spanish women. In terms of heart attacks per 100 000 population, the rates in males stood at 915 in North Karelia, 823 in Glasgow and 781 in Belfast. This compares to male rates of 240 in Toulouse (France), 187 in Catalonia and 76 in Beijing. Heart-attack rates per 100 000 for women were 256 in Glasgow and 197 in Belfast, compared to 37 in both Beijing and Toulouse, and 30 in Catalonia. While risk factors such as smoking, diet, blood pressure and cholesterol undoubtedly play a role, their differential effects in population groups require further research.

Findings from WHO's multinational monitoring project (MONICA) reinforced the evidence on differences between the sexes in terms of heart attacks – men aged 35-64 being 4 or 5 times more at risk than women of the same age.

Heart disease is commonly characterized as a lifestyle disease of the affluent, but there is also clear evidence that it is a problem in poor countries because of lifestyle changes. In addition rheumatic heart disease killed some 400 000 people in developing countries in 1993, even though it is easily preventable.

Rheumatic fever is caused by streptococcal bacteria and is spread in overcrowded highly contagious living conditions. In the case of repeated attacks of sore throat, severe damage to the heart valves may occur if the disease is left untreated. Five or more years of regular monthly treatment with penicillin at $1 per dose can prevent damage to the heart. This avoids heart-valve surgery at a cost of between $4 000 and $40 000 per patient.

Rheumatic heart disease strikes the young – those aged 5 to 35. WHO estimates that some 370 000 new cases of rheumatic fever and 150 000 recurrences take place each year, producing an annual toll of some 300 000 new cases of rheumatic heart disease. There are estimated to be at least 2 million children aged 5-15 with rheumatic heart disease in India alone.

Hypertension or high blood pressure is the most common cardiovascular dis-

The outbreak of plague in India in 1994 was a stern reminder to the world that a dreaded disease often regarded as a scourge of the past still exists.

order. Globally 8-18% of adults have high blood pressure, the normal value being defined as under 140/90 mmHg. This condition is a major contributor to heart disease as well as to stroke, kidney failure and other problems.

In the USA alone the condition affects an estimated 50 million people – or almost 1 in 4 adults; each year 29 million working days and $2 billion in earnings are lost to the country due to hypertension-related illnesses.

Lifestyle changes such as losing weight, reducing excessive salt and alcohol intake and increasing levels of physical activity can all help to lower blood pressure. Drugs such as diuretics and beta-blockers are widely prescribed for hypertension in industrialized countries but their cost can be prohibitive in the developing world.

Stroke and ***other cerebrovascular diseases*** killed about 4 million people in 1993, representing 7.5% of total global deaths from all causes. Stroke is a major cause of handicap in middle-aged and elderly people, causing partial paralysis or impairment to speech and other mental faculties. Stroke patients pose a growing problem in developed countries but their needs are largely ignored, with rehabilitation services given low or no priority. The care for such individuals falls largely on families.

Cancer killed some 6 million people in 1993. The majority of the deaths occurred in the developing world, although cancer is widely perceived to be a disease of industrialized nations. In the developed world there were around 2.5 million cancer deaths, contributing some 22% of the total. By contrast the 3.5 million cancer deaths in the developing world made up just 9% of the total. There were estimated to be some 20 million cancer sufferers in the world in 1994, with 9 million new cases a year. (*Box 7*).

An analysis carried out in 1993 by the International Agency for Research on Cancer (IARC) looked at worldwide cancer mortality trends in 24 geographical areas, using 1985 data. Worldwide, lung cancer was the biggest single killer in men, accounting for 22% of cancer deaths. In women breast cancer was the main cause of cancer deaths in developed countries and the second cause in the developing world after cervical cancer. Another frequent cause of death for both sexes was stomach cancer, followed by liver cancer in men and colon cancer in women. The researchers estimated that 20% of all cancer deaths could be prevented if tobacco smoking was eliminated.

Deaths from cancer of the liver and of the cervix, both major problems in the developing world, could be substantially reduced by vaccination against hepatitis B and the introduction of cervical smear test programmes. If all countries were able to introduce an effective community-wide screening programme as in Finland, 76% of the world's deaths from cervical cancer – expected to reach around 276 000 by the year 2000 – could be prevented. A vaccination campaign against hepatitis B in countries with high rates of carriers could reduce deaths from liver cancer by at least one-half. Liver cancer is expected to kill some 296 000 men and around 137 000 women by the end of the century.

By the year 2000 there are expected to be about 4 million deaths annually from cancer in males worldwide, up from 3.1 million in 1990, and 3.2 million female cancer deaths (up from 2.6 million). Of the projected male cancers around 2.3 million will occur in the developing world and 1.6 million in the developed. Of the female cancers almost 2 million will occur in the developing world and about 1.2 million in the developed.

WHO estimates that in 25 years' time new cases of cancer each year (not deaths) in developed countries will have increased from roughly 4 million today to 5.5 million. In the developing world the figure will have doubled from 5 million to 10 million. Almost two-thirds of cancers over the next 25 years will occur in the developing world. Approximately 20 million people are alive with cancer at present; by 2015 there will probably be more than 30 million.

Chronic obstructive pulmonary diseases such as chronic bronchitis and emphysema killed nearly 2.9 million people in 1993, representing about 6%

Box 7.
Main cancer killers
(all countries, 1993)

Trachea, bronchus and lung	1 035 000
Stomach	734 000
Colon and rectum	468 000
Mouth and oropharynx	458 000
Liver	367 000
Female breast	358 000
Oesophagus	328 000
Cervix	235 000
Lymphoma	221 000
Pancreas	214 000
Leukaemia	207 000
Prostate	182 000
Bladder	135 000
Ovary	123 000
Uterus	64 000
Skin	37 000

of total deaths. The number of sufferers in the world is put at 600 million. This is the second largest known category of persons with a single disorder recorded by WHO. At the same time there are believed to be 275 million asthma sufferers in the world, although WHO has no data on the number of deaths each year due to this condition.

In the United Kingdom respiratory diseases account for one-quarter of general practitioner consultations. The most prevalent of them, chronic bronchitis, afflicts 8-17% of the population. These data are typical for Europe, but there are also widespread problems in developing countries. Data from four African countries show that 10-20% of adults have chronic bronchitis. Similar figures have been obtained from India and Nepal. Of the 2.9 million deaths from chronic obstructive lung diseases, nearly 2 million were in the developing world.

Indoor pollution from fuels like brown coal in China, or wood and cattle dung in Africa, is the main risk factor in the developing world whereas in developed countries it is cigarette smoking. There is increasing concern that air pollution and car exhaust emissions may be adding to the rising number of asthma cases.

Diabetes mellitus is a growing public health problem in both developed and developing countries. A recent WHO expert group estimated that more than 100 million people will suffer from diabetes by the end of this century – 85-90% of them with the non-insulin-dependent form (NIDDM). Older people and urban dwellers are more susceptible to NIDDM. In Europe the prevalence is 2-5% of the adult population. Recent surveys indicate a prevalence of diabetes in the Indian subcontinent of 10% rising to 25% by the age of 60. On the Pacific island of Nauru and among the Pima Indians of Arizona in the USA, half the population aged 30-64 are affected, and it is predicted that 1 in every 5 North Americans will develop the disease by the age of 70. NIDDM is strongly associated with the adoption of a Western lifestyle, with risk factors including obesity, lack of physical exercise and inappropriate diet, and is thus potentially preventable.

Insulin-dependent diabetes mellitus, which usually starts in childhood, requires daily insulin injections and continual vigilance against taking too much or too little insulin. In developing countries the prohibitive cost of insulin can mean that the condition is a death sentence. Even in the best-controlled cases, with both forms of the illness, there is a greatly increased risk of heart disease, kidney failure, blindness and gangrene leading to limb amputations. These complications are extremely costly, both to the individual and to society. One recent estimate put the cost of diabetes in the USA alone, both direct and indirect, at $92 billion a year.

Congenital and ***hereditary diseases*** are growing public health concerns. 25-60 per 1 000 liveborn infants are estimated to have congenital abnormalities. Rapid progress in molecular genetics is making it increasingly possible to screen for inherited conditions, particularly single gene defects such as thalassaemia and cystic fibrosis, and is at the same time opening the way to their treatment.

Such techniques will alert parents to the possibility that their child will be badly handicapped, while having ethical and resource implications for health services and society as a whole. Couples face the moral dilemma of deciding whether or not to opt for an abortion in countries where this is permitted. In the case of diseases like Huntington chorea, where the effects will not become apparent until late middle age, there is a real question of whether people want the knowledge of what is going to happen to them.

Society has to decide how widely genetic screening services should be organized, and how much effort should be put into counselling couples about the implications of the tests. The dilemmas are likely to increase rapidly as new disease-causing genes are being discovered virtually every week. When genes are found that contribute to common illnesses such as heart disease, cancer and mental illness, the decision about whether to set up screening programmes

Diabetes mellitus is a growing public health problem. More than 100 million people will suffer from diabetes by the end of this century.

or not will become even more acute. There will probably be growing consumer pressure for such services and hard decisions will have to be made about what health resources should be devoted to them.

Mental health

Where in the global burden of disease should sorrow rank? Bereavement, separation, loss or betrayal can cruelly undermine the human spirit. The pain of emotional wounds may last a lifetime. The burdens of sorrow, depression and anxiety, the silent misery of loneliness and rejection, particularly amongst many elderly people, are largely ignored.

On average smoking kills 6 people a minute. Smoking is already killing 3 million people a year worldwide.

Mental ill-health is at the bottom of the medical pecking order. Only the most severe cases, such as schizophrenia or manic depression, receive what minimal care there is, even in developed countries. Moreover there are disturbing signs that society would sooner have such patients wandering the streets homeless than provide them with the care they need. The stigma of "madness" is still a potent barrier in preventing ill people from receiving help.

Some 500 million people are believed to suffer from neurotic, stress-related and somatoform disorders (psychological problems which present themselves as physical complaints). A further 200 million suffer from mood disorders, such as chronic and manic depression. Mental retardation affects some 83 million people, epilepsy 30 million, dementia 22 million and schizophrenia 16 million. In developed countries a huge proportion of visits to family doctors are not for medical, but for social or emotional reasons. The problems are to do with low income, unemployment, poor housing and failed relationships, and in most cases it is beyond the doctor's power to help.

Safeguarding mental health in increasingly fractured societies, where many of the previous cultural and social support systems (such as the family or organized religion) are weakening, is an awesome challenge reaching far beyond the realms of health care systems.

Smoking

Smoking is emerging as the world's largest single preventable cause of illness and death. WHO estimates that there are about 1.1 billion smokers in the world today. About 300 million (200 million males and 100 million females) are in the developed world – but in developing countries there are nearly 3 times as many, some 800 million, almost all males. Globally 30% of adults (48% of men and 12% of women) are regular smokers. On average smoking kills 6 people a minute. Smoking is already killing 3 million people a year worldwide. If current trends continue, this figure is expected to reach 10 million by 2020.

In the USA, where traumatic deaths are more common than in other developed countries, the risk from smoking still far outweighs other dangers. On average among 1 000 20-year olds who smoke cigarettes regularly, about 6 will die from homicide; about 12 will die in motor-vehicle accidents; about 250 will be killed by smoking in middle age; and a further 250 will die from smoking in old age.

A recent British study concluded that smoking can kill or cause harm in 24 different ways. The diseases include cancers of the lung, mouth, pharynx, larynx, oesophagus, stomach, intestine, pancreas and bladder, leukaemia, chronic bronchitis and emphysema, pulmonary heart disease, tuberculosis, pneumonia, raised blood pressure, heart disease, blocking of the arteries, brain clots, two forms of brain haemorrhage, sudden rupture of the aorta, stomach ulcers and duodenal ulcers. There are additional dangers for women. Smoking can cause ectopic pregnancies, increase the chances of a premature or underweight baby, and contribute to cervical cancer by damaging the lining of the cervix.

Many studies, including the above, have highlighted the benefits of stopping smoking, even after many years. Those who stop at any age before serious disease sets in have mortality rates in later life considerably lower than those who continue. It's never too late to stop.

Oral health

Oral health status, as reflected by the average number of decayed, missing and filled teeth among 12- year old children, is generally improving in the developed world; the developing and the least developed countries, however, showed a deterioration. Globally there were about 1.9 billion persons with dental caries; 165 million with periodontal diseases; and 13 million with edentulism. The number of teeth still possessed by elderly people is a crucial factor in whether they can eat properly and hence affects their quality of life, yet oral health is given low priority in many countries.

Inadequate access to basic or emergency oral health care is now better recognized to be a problem in the developing world. Although reliance continues to be placed on dentists and the use of expensive, sophisticated equipment, the situation is now that affordable and sustainable activities are being identified to extend care to rural and disadvantaged urban communities.

Accidents, violence and suicide

External causes of mortality, such as motor-vehicle accidents, fires, homicide and violence, suicide and occupational disease and injuries killed some 4 million people in 1993, or nearly 8% of the global total (of which some 3.1 million were in the developing world). Falls, fires, drowning and such like killed 1.8 million people. Motor and other road accidents killed 885 000 people and there are estimated to be about 10 million such accidents each year. Around 779 000 people took their own lives and some 302 000 died as the result of violence or homicide. Occupational accidents claimed the lives of 220 000 people. These figures do not include those killed in wars and civil unrest.

Poverty, as in almost every other category of illness and disease, plays a significant role in increasing the chances of death and injury from external causes. Unsafe working conditions, inadequate housing, poor road engineering, the widespread use of agricultural and other chemicals without proper precautions, social breakdown and even military conflict are all rooted in economic and social factors.

Injuries remain in most countries a persistent, and in some cases increasing, cause of death and disability, particularly among the young. Accidental injury is an important cause of death in children and young adults (5-29 years). If homicide is added, external injury is a leading cause of mortality in this age group. There are an estimated 330 000 occupational injuries every day in addition to a daily toll of about 600 deaths. Almost 70 million new cases of occupational disease result each year from various exposures at work. Agrochemicals cause around 3 million poisonings annually, mostly among poorly-protected labourers in the developing world. Despite the scale of the problem, up to 90% of workers have no access to occupational health services.

There are an estimated 330 000 occupational injuries every day in addition to a daily toll of about 600 deaths.

Blindness and deafness

There were about 38 million blind people worldwide in 1990, with an increase of 10 million since 1978. Some 58%, or 22 million people, are aged 60 and above. In addition there are estimated to be a further 110 million people with impaired vision. Based on population trends, there may be 54 million blind people over the age of 60 by the year 2020, of whom more than 50 million will be in developing countries. It has been estimated that 42 million people worldwide suffer from moderate to serious hearing loss. However, this is likely to be a gross underestimate.

Women's health

In developed countries in 1991 there were more than 200 000 deaths of women aged 15-44, of which 4 000 were ascribed to maternal causes. In the developing world there were almost 2.4 million deaths among women in the same age group; and of those, more than 500 000 – almost one-fifth – were ascribed to maternal causes, most of which are easily preventable. Chief among the

causes were haemorrhage, sepsis, hypertensive disorders of pregnancy and obstructed labour. Each year millions of children are left without mothers, thus imperilling their own immediate safety and leaving them vulnerable to psychological and social burdens in the future.

Box 8. The mother-baby package

The mother-baby package is based on the following principles considered to be the four pillars of safe motherhood:

(1) to ensure that individuals and couples have the necessary family planning information and services to plan and space pregnancies;

(2) to provide proper antenatal care so that complications of pregnancy are detected as early as possible and correctly treated;

(3) to give all birth attendants the necessary knowledge, skills and equipment to perform a clean and safe delivery and provide postpartum care to the mother and baby;

(4) to make essential obstetric care available for all high-risk cases and emergencies.

The package recommends a basic set of simple interventions focused on the main causes of maternal mortality:

- before and during pregnancy: information and services for family planning; STD/HIV prevention and management; antenatal registration, checkups; treatment of existing conditions (e.g. malaria, hookworm); advice regarding nutrition and diet; recognition, early detection and management of complications such as eclampsia, bleeding, abortion and anaemia; tetanus toxoid immunization; iron/folate supplementation;
- during pregnancy: clean and safe delivery; access to essential care at a health centre or hospital for bleeding, eclampsia, prolonged/obstructed labour and other complications;
- after delivery (mother): prevention and early detection of postpartum haemorrhage, sepsis and eclampsia; postpartum care including support for breast-feeding, family planning and STD/HIV prevention services, tetanus toxoid immunization;
- after delivery (newborn): resuscitation when necessary; keeping the baby warm; early and exclusive breastfeeding; prevention, early detection and treatment of infections including ophthalmia neonatorum and cord infections.

If properly applied the mother-baby package could avert about 270 000 maternal deaths or over 50% of the estimated total of around 500 000 per year, as follows:

Cause of death	Percentage of deaths averted
Haemorrhage	55
Sepsis	75
Eclampsia	65
Obstructed labour	80
Unsafe abortion	75
Indirect causes	20

The differences in maternal mortality between countries are unacceptable. In Europe maternal mortality is 50 per 100 000 live births. In Africa the figure is more than 670 – a 13.5 times greater risk. Maternal mortality in the 47 least developed countries is appallingly high, reaching more than 700 per 100 000 live births in 1991.

Of the half a million estimated maternal deaths in 1991, haemorrhage caused about 130 000, with an estimated 14 million cases annually. Indirect causes during pregnancy, such as anaemia and malaria, resulted in 100 000 deaths out of a total of some 13.5 million cases. Sepsis took the lives of 75 000 women, with around 12 million cases. Obstructed labour was responsible for the deaths of 38 000 women, with some 7 million cases. Hypertensive disorders of pregnancy, including pre-eclampsia and eclampsia, took the lives of about 60 000 women, with an estimated 7.1 million cases a year. Between them haemorrhage, sepsis, abortion, hypertensive disorders and obstructed labour are believed to have resulted in the long-term or permanent disablement of some 18 million women (from conditions including severe vaginal, urinary and bowel problems, ectopic pregnancies and infertility).

There were an estimated 140 unsafe abortions for every 1 000 live births in 1990. Among 1 000 women aged 15-49 there was one unsafe abortion in market-economy countries, 23 in countries in economic transition, 16 in developing countries, and 28 in the least developed countries. In all, there are around 20 million such procedures each year, causing the death of almost 70 000 women.

Globally it is estimated that in 1990 more than half the number of pregnant women were anaemic, a threat not only to the mother's health, but also a contributing factor to low birth weight. Hookworm infection due to *Necator americanus* and *Ancylostoma duodenale* exacts a heavy toll especially on women of childbearing age and young girls, causing iron deficiency anaemia which

is associated with high maternal mortality and morbidity and lowered school performance. WHO has estimated that 44 million pregnant women worldwide are infected.

While there are justifiable concerns over the lack of medical care for pregnant women in developing countries, there are complaints in many developed countries that the process of birth has become overmedicalized, so that a natural human process has been turned into an illness. The widely differing rates for Caesarean deliveries, for instance, suggest that birth practices are influenced by factors other than strictly medical indications. In the Americas, Caesarean section accounted for 5% to 34% of deliveries.

Over the past three decades contraceptive use has increased by 27% globally, rising in the less developed world from 9% in 1960-65 to 53% in 1990. But there are still very large unmet family planning needs. In order to meet United Nations goals to reduce world population growth, contraceptive rates in developing countries will have to increase to 59% by the year 2000.

In summary 72% of maternal deaths are due to the same five main causes around the world: haemorrhage, sepsis, obstructed labour, eclampsia, and unsafe abortion (*Box 8*). The remaining 28% are due to conditions aggravated by pregnancy, such as malaria or hepatitis. In the wider sense, however, it is poverty and lack of knowledge which cause these deaths. Underlying the medical causes of death are the social, economic and cultural determinants of poor maternal health. Low levels of resources and skills and insufficient infrastructure make access to care difficult. In addition, women's inferior socioeconomic status, lack of resources and decision-making power and low levels of education hinder their use of appropriate maternal health care services. Premature death and suffering related to childbearing are not inherent in the human condition – they are rooted in the social, cultural and economic settings of the countries where they are prevalent. Something can be done about them.

Health of the elderly

A greying world

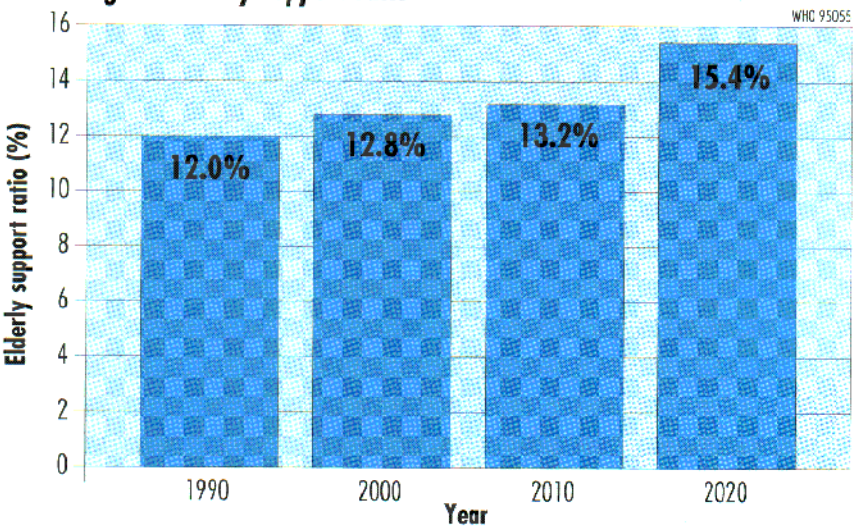
The increase in the number of old people in the world will be one of the most profound forces affecting health and social services in the next century. In the poorest countries childhood deaths are a key factor in average life expectancy. But for people who do survive, increasing numbers will go on to old age.

Overall the world's population has been growing at an annual rate of 1.7% during the period 1990-1995 – but the population over 65 years is increasing by some 2.7% annually. Of a world total of 355 million people over 65 in 1993, more than 200 million were in the developing world, where they made up 4.6% of the population, and more than 150 million in developed countries, where the proportion was 12.6%.

The process of population aging started earlier in Europe, and 18 of the 20 countries with the highest percentages of elderly are in that region (the others are Japan and the USA) where 13-18% of the population is already over 65 years.

However, the most rapid changes are being seen in the developing world, with predicted increases in some countries of up to 400% among people aged over 65

Fig. 6. Elderly support ratio[a]



[a] Population aged 65 or more as a percentage of the population aged 20–64.

Box 9. Healthy life expectancy

More than 15 years ago all the countries of the world resolved that their health and health-related activities should have a common goal of ensuring by the year 2000 that the health status of all people should be such that they can at least work productively and participate actively in the social life of their community. Recent studies, however, indicate that mortality reductions have sometimes resulted in a lengthening of life in unhealthy circumstances, increased inactivity and dependency as well as higher rates of chronic, non-lethal impairments, particularly among the elderly. It is being asked whether people are surviving chronic diseases only to live on in poor health.

Since life expectancy measures are of limited interest when it comes to assessing the quality of years lived, whether during early years or at higher ages, several other measures are being investigated – for example disability-free life expectancy, quality-adjusted life expectancy, disability-adjusted life years (used by the World Bank), and years of productive life lost (used by OECD). More recently the notion of "health expectancy" has emerged, referring to life expectancy in a given state of health, as governed by a broad range of positive and negative factors such as impairment, disability, handicap and self-rated health.

Although international comparisons are not yet possible due to differences in study design, data collection and the classification of health expectancy, recent research has shown the following patterns of general life expectancy (LE) and disability-free life expectancy (DFLE) in different groups of countries.[a]

Independent life expectancy[b]

Selected countries (latest available data)	At birth				At age 65			
	Male		Female		Male		Female	
	LE	DFLE	LE	DFLE	LE	DFLE	LE	DFLE
Developed market-economy countries								
Canada, 1986	...	...	...	...	14.9	8.1	19.2	9.4
Finland, 1986	...	...	...	...	13.4	2.5	17.4	2.4
United Kingdom, 1991	...	...	...	...	14.3	13.6	18.1	16.9
Least developed countries								
Myanmar, 1989	...	...	...	...	12.0	11.1	13.5	12.8
Other developing countries								
Egypt, 1989	...	...	...	...	12.1	10.8	13.3	10.1
Fiji, 1984	...	...	...	...	13.1	10.5	14.6	10.4
Malaysia, 1984	...	...	...	...	13.4	11.9	15.0	12.7
Republic of Korea, 1984	...	...	...	...	12.9	9.0	15.0	9.4
Sri Lanka, 1989	...	...	...	...	13.2	12.3	14.7	13.4
Tunisia, 1989	...	...	...	...	12.7	11.3	13.8	11.4

Functional limitations-free life expectancy[c]

Selected countries (latest available data)	At birth				At age 65			
	Male		Female		Male		Female	
	LE	DFLE	LE	DFLE	LE	DFLE	LE	DFLE
Developed market-economy countries								
Australia, 1992	74.5	58.2	80.4	64.0	15.4	6.4	19.2	9.0
Spain, 1986	73.2	61.6	79.6	63.6	15.0	7.0	18.4	6.9
Other developing countries								
Indonesia, 1976-1977	51.8	47.8	54.8	50.3	...	...	...	...

[a] Based on figures prepared by the Network on Health Expectancy and the Disability Process (REVES), which brings together researchers in this field.

[b] Refers to the average number of years an individual is expected to live without restrictions in a number of basic activities of daily living such as getting in and out of bed, dressing and washing, and "instrumental" difficulties such as cooking, shopping and housekeeping, if current patterns of mortality and difficulties in performance of the activities continue to apply.

[c] Refers to the average number of years an individual is expected to live free of limitations on functions such as bending, picking up objects and walking, if current patterns of mortality and difficulties in performance of the functions continue to apply.

during the next 30 years. In developed countries the increase will in some cases be as low as 30%.

Alongside an increase in the number of people aged over 65 there will be a dramatic rise in the numbers of "old old" – people over 80. In 1993 they constituted 22% of those over 65 in the developed world and 12% in the developing world.

Longer life – or more years of sickness?

The world elderly support ratio (the number of people over 65 years compared to those aged 20-64) in 1990 was 12 elderly to every 100 people of working age (*Fig. 6*). It is estimated that the figure will be 12.8 in the year 2000 and 13.2 in 2010. The estimated ratios for 1990 and the year 2000 were 20 per 100 and 23 per 100 respectively in developed countries and about 9 per 100 and 10 per 100 in the developing world. In other words while population growth during 1990-2000 is estimated to be 17%, the increase in the number of elderly is likely to be 30%.

Over the coming decades there will be more old people depending on fewer people of working age as the source of funding for their health care. Advances in health technology extend life, but do not necessarily improve the quality of life and raise profound ethical questions. Unless the productivity of the working age population increases, there will be a growing problem of providing the funds to enable the elderly to live a secure and dignified life.

One of the most difficult questions facing health planners and politicians trying to allocate funds, as well as the community and individuals themselves, is whether increased life expectancy means more health or simply more years of sickness. Life expectancy is not an indicator of the burden of disease in old age. Increasing age makes self-reliance more difficult. It brings growing disability, an inability to walk, climb stairs or carry heavy loads and so on. In addition old age can bring financial hardship and

poverty, as even well-provided pensions – where they exist – are less than people earned when they were working.

Surveys of elderly people in many countries show a high prevalence of such conditions as arthritis and rheumatism, deafness and poor vision and of specific chronic diseases of the heart, brain and lungs including stroke, dementia and cancer. Old people are therefore high consumers of health services. In some countries the elderly comprise just 10% of the population but use 30% of the services. One of the most urgent but so far generally neglected needs with regard to care of the elderly is to find some sort of measure to assess disability and the quality of life, in order to provide information for setting of service priorities, planning and evaluation (*Box* 9).

Dementia and arthritis

Two of the most cruel burdens facing the elderly are dementia, particularly Alzheimer disease, and the crippling pain of rheumatism and arthritis. Both can destroy quality of life, place huge burdens on relatives and carers and take up immense amounts of health and social service resources, although neither is amenable to cure.

Dementia, a sad and often lengthy life in limbo for both sufferers and their relatives, is believed to affect at least 22 million people worldwide. The chances of contracting the condition increase with old age so that those over 80 have a 15-20% chance of becoming demented. In the 12 states that comprised the European Union in 1994 it was estimated that in 1990 there were some 3.5 million people with dementia. By 2000 this figure is expected to increase to about 4 million.

Joint pain caused by rheumatism and arthritis places a huge burden on the elderly, but it largely goes unrecorded and is sometimes seen by doctors as the inevitable price of getting old which patients have to bear. However, it is the reason for massive prescriptions of painkillers, which in themselves can go on to cause stomach ulcers, and is the prime reason for the lengthening queues of elderly people needing hip replacement and other joint-replacement operations. The prevalence of rheumatoid arthritis in different populations has been estimated at 1-5%. Assuming an average prevalence of 3%, this suggests that there are at least 165 million people in the world with rheumatoid arthritis.

The second most prevalent chronic rheumatic disease is osteoarthritis, which can strike all the joints. It causes significant damage to the knees in about 20-40% of people over 70 years and to the hips in 5-10% of those aged over 65.

Another significant skeletal disease in the elderly, particularly among women, is osteoporosis – thin bone disease. Around 1 in 3 women aged over 50 are affected and are thus far more prone to bone fractures, including broken hips and damage to the vertebrae. About 1.7 million hip fractures occurred in 1990 throughout the world. Global data on vertebral fractures and forearm fractures are not available.

Institutional care

Long-term care of the frail elderly is becoming one of the most hotly-debated medical and political issues in many developed countries, and the developing world too will soon have to wrestle with it.

The question of who pays for the care of the elderly will increasingly confront health services around the world, and society as a whole. Old age can bring great loneliness. In developed countries, and increasingly in developing ones, a woman whose husband dies in his 60s may still have 20 or even 30 years of life as a widow. If people are not to be left destitute, and uncared for at the end of their lives, more attention must be given to social mechanisms for the support of the elderly and the means to fund them. The problem of aging need not be medicalized. Making the aging population a resource for the community and health services enables them to live in dignity.

Dementia, a sad and often lengthy life in limbo for both sufferers and their relatives, is believed to affect at least 22 million people worldwide.

Poverty has continued and will continue to be a major obstacle to health development.

General health issues

A changing world

In the last 10 years there has been an unforeseen and overwhelming global trend towards the democratization of political systems, accompanied by much greater participation of people in determining their own future. On the other hand, while the end of the cold war has relieved the tension between East and West, regional and local conflicts and warfare have persisted and emerged. Hopes were high for reduced spending on arms and greater spending on health development. So far this "peace dividend" has not materialized, or has been absorbed by peace-keeping efforts, leaving meagre resources for human development. At the same time the growth in the numbers of refugees and displaced people in recent years due to these conflicts has raised serious problems for the provision of health care, and it would be naive to expect that they will disappear.

The changing demographic picture across the world together with the rapid shift towards urbanization will have profound implications for the delivery of health services. The unplanned and often chaotic growth of megacities in the developing world will pose particular challenges, as poor sanitation and housing will encourage the spread of infectious diseases.

Long-term growth in the capacity of the world economy to supply goods and services has led to widespread improvements in material standards of living for most of the world's population. Nevertheless, although the gap between developed and developing countries has narrowed, the gap between the developing and least developed countries has widened. Although it is difficult to see such a situation changing markedly over the next five years, efforts to bridge the gap must be a priority for the world community.

Poverty has continued and will continue to be a major obstacle to health development. Poverty is perhaps the major single determinant of individual, family and community health. The number of poor people has increased substantially, both in the developing world and among underprivileged groups and communities within developed as well as developing countries – particularly in the slums of the great cities. During the second half of the 1980s, the number of people in the world living in extreme poverty increased, and was estimated at over 1.1 billion in 1990 – more than one-fifth of humanity. An expanding world population and a growing elderly population carry with them the danger of an even greater divide between those who are rich and those who are poor. Here again is a formidable gap to be bridged.

Against any optimism about the global economy throughout the remainder of this century and beyond should be set a number of major uncertainties. There has been a disproportionate flow of resources from the developing to the developed world – poor countries paying money to rich countries – because of debt servicing and repayment and as a consequence of prices for raw materials that favour the latter at the expense of the former. Structural adjustment policies aimed at improving economic performance of poor countries have in many cases made the situation worse. The words of Robert McNamara, spoken in 1980 when he was President of the World Bank, still hold true: "The pursuit of growth and financial readjustment without a reasonable concern for equity is ultimately socially destabilizing".

A worrying trend is growing unemployment, especially in developing countries without social security arrangements to cushion those out of work. Studies in a number of countries have documented the severe negative effects of unemployment on health. Long-term unemployment is creating a new class of "untouchables" – by excluding a large group of people from the mainstream of development and society. This is yet another gap to be bridged. The unemployed are a potent reminder of the dangers of assuming that the general prosperity of a county will trickle down to all its members. Even in the

wealthiest countries, such as the USA, the gap between the richest and the poorest has widened dramatically over the past decade, with a fall in real wages for the poorest. In many countries of the former USSR the transition to market economies has been accompanied by a drastic fall in real wages for many. The inability to buy nutritious food or secure warm and dry accommodation is producing a legacy of ill-health which may persist for many years until the benefits of market economies become tangible for all.

There is considerable concern about the adverse health effects of continuing environmental degradation, pollution and the uncontrolled dumping of chemical wastes, diminishing natural resources, depletion of the ozone layer and predicted global climatic changes. The Rio Declaration which emerged from the 1992 United Nations Conference on Environment and Development, with its action plan on sustainable development, gives hope that action will be taken to protect the future health of the people of the world by preventing environmental disaster.

The global situation with regard to literacy is improving, but this improvement is not shared equally. Illiteracy, common among women and the poor, continues to impede health and social development. Overall adult literacy is expected to increase to about 80% by the end of this century, although for the least developed countries a rate of only about 50% is projected. Millions of young people still have no opportunity for education, and girls and women continue to be underrepresented in the classroom; female literacy remains a key developmental issue.

The structure of the family, the basic unit of support and nurture for both children and adults, is undergoing rapid evolution in many parts of the world. Extended networks of relatives are being lost and traditional patterns of social support thereby weakened.

A growing number of women in the developed as well as in the developing world are entering paid labour for economic reasons. This produces welcome household resources but can also increase social strains within families and place even greater burdens on women. However, because of the cultural and social setting, aging populations function as resources in the family, community and health services in most developing countries.

Changing social mores, with a move towards shorter marriages and more divorces in many countries, are leading to family breakdowns which have repercussions for individuals and for social services that may be called in to provide help for children and single parents. Family breakdown has an impact on the behaviour of young people with regard to sexual relationships and the use of tobacco, alcohol and other drugs. The ultimate family breakdown involves the situation where children leave home or are pushed out, and are forced to eke out an existence on the streets. The millions of street children across the world pose a severe challenge to health and welfare services. It is difficult to prescribe easy remedies as to how these children should be reached and their future looks bleak unless there is a major societal shift in accepting that their care should have priority.

The soaring world population will strain to the limit the ability of social, political, environmental and health infrastructures to cope. It more than doubled from 2.5 billion in 1950 to almost 5.6 billion in 1993, with 4.4 billion in the developing world, including 556 million in the least developed countries.

In many least developed countries geographical, climatic and environmental factors remain a major factor of ill-health. Many have wet tropical climates which favour mosquitos and other vectors of disease. Many still lack safe water and sanitation, upon which the control of many infectious diseases largely depends. In 1990, more than 1 billion people in the developing world lacked access to safe drinking-water.

The soaring world population will strain to the limit the ability of social, political, environmental and health infrastructures to cope.

In many countries the skills mix of health teams is still inappropriate, and personnel are poorly distributed. Market forces alone cannot achieve a rational and cost-effective mix.

Sustaining health for all

The concept of health for all has changed the world's thinking about how health should be provided. Placing equity of access to health at the heart of health-care delivery and giving greater emphasis to achieving this goal through primary health care has become a global blueprint. However, sustaining both the belief in the concept and its practical implementation has been difficult, partly because of the economic recession, cost implications, resistance to change and political problems in diverting resources from other areas towards health. The fundamental reason is that there is still little recognition at the political and policy levels of the close interrelationship between poverty and ill-health. It is disheartening to see that resources are allocated for high technology medicine while ignoring the basic human needs of the poor. A rectification of this imbalance will not only make the poor more healthy but also less poor. There is a need for strong and sustained leadership to continue to push forward the goals of health for all – and there is an overwhelming need to retain and implement the principle of fair and equal treatment for all, so ensuring better health and not merely improving access to health care.

Environmental health hazards

Acute and chronic exposures to chemicals during their production, storage, transport and use affect many millions of people every year. Agrochemicals alone lead to about 3 million poisonings a year. Millions more people are exposed to toxic chemicals in food, drinking-water or air.

Naturally occurring toxic chemicals are of particular concern in poor communities with a traditional lifestyle, especially if people get most of their food and all their drinking-water from local sources. Geochemical conditions may create particularly high concentrations of trace elements in food or water, leading to local endemic diseases, which may affect millions of individuals.

Epidemics of poisoning in such circumstances have occurred in India and Afghanistan and are major concerns in other parts of Asia and in Africa. The extent of the health impact is unknown, but more is being learned about local situations as national chemical safety programmes are formulated.

Resources for health

Resource constraints are forcing most countries to reassess their existing arrangements for health care financing and provision. Many countries are concerned about responding to growing demand and rising costs in the health sector, while ensuring value for money. They are under pressure to develop health policies and structures that provide better quality health care while using resources more efficiently. Governments are experimenting with alternative forms of health financing (*Box 10*). In many countries a complex mix of funding sources and care providers in both public and private sectors is emerging. The role of government is increasingly being seen to create an enabling environment in which all providers are regulated, monitored and evaluated in a coordinated fashion. But there is unease in some quarters that governments may be silently withdrawing from their responsibilities to provide care, acting instead as ring masters while other actors do the work.

In many countries the skills mix of health teams is still inappropriate, and personnel are poorly distributed. Market forces alone cannot achieve a rational and cost-effective mix. Scientific and technical developments, changes in health care delivery and the need to keep costs from rising all mean that innovative thinking is required about how health professionals are to be deployed. This will probably require radical departures from traditional roles.

Health infrastructure

The most protective vaccines, the most effective drugs, the most powerful antibiotics – none are of use if the people in need do not get them. Although the concepts of the rational use of drugs and the essential drugs list are widely accepted, the lack of foreign currency for purchasing needed supplies inhibits countries' ability to provide primary health care to a great many people. About 1 billion people worldwide do not have regular access to local health services.

At the same time cheap, effective, life-saving treatments sit unused on shelves while people are dying because still in many areas of the world the delivery systems to get them to the population do not exist or are inadequate. Health infrastructure – the buildings and equipment, the staff, the drugs and vehicles – is central to good health. Health infrastructure is the skeleton which supports health care (including the specialist care given in hospitals) and without which no health programme can be sustained.

Increasingly there is a recognition that health services must be provided close to the people who need them – and an integrated, cost-effective approach is necessary. People need a point of entry – the first level of care – which not only provides a basic package of services appropriate to the epidemiological situation but also facilitates access to all other services which may be needed.

Although in the past special programmes for specific diseases – immunization for example – have produced truly impressive results, it is no longer sustainable or cost-effective to set up self-contained taskforces for individual illnesses. Fragmented and duplicated health care services jeopardize the effective use of available health resources, and the continuity and sustainability of services. It makes no sense for doctors and nurses to vaccinate children if at the same time children die because they do not have antibiotics against pneumonia or oral rehydration therapy for diarrhoea.

It makes no sense for child health nurses to give superb care to infants but ignore the fact that a mother has ma-

Box 10. Health systems on the move

Most countries today are attempting to adopt health policies and structures that provide better care, use resources more efficiently and encourage appropriate health-seeking and health-promoting behaviour.

The poorer countries increasingly recognize that health and socioeconomic development cannot be pursued independently, and that limited resources have often been spent mainly on large urban hospitals as a result of poor investment decisions taken in a context of underdeveloped planning, budgeting and financial information. However, systems that are well organized and geared to making health care accessible to all nevertheless require considerable resources. User charges, community-financing and health insurance have all been envisaged as funding mechanisms.

The richer countries are struggling to maintain or improve standards while controlling total health spending which has been spiralling owing to aging populations, the introduction of expensive technologies and rising expectations. Concerns from the patient's point of view have been waiting lists, impersonal attention and limited freedom in the choice of health care provider. Organizational change, healthy lifestyles and the environment are high on all agendas.

Two important concerns are shared by most countries. The first is to redefine the roles of the key actors – governments, care providers, consumers and health financing agencies. The second, common to many low- and middle-income countries, is to find new financing mechanisms that will generate additional resources and bring greater efficiency and equity in health. The financing and provision of care is increasingly seen as a partnership between government and other actors.

In countries changing from a centralized-controlled to a liberal economy, health care has deteriorated and health policies are in a state of flux, as financing shifts from integrated public models to more pluralistic systems. Reform in such circumstances focuses on improving the quality and effectiveness of services, and lays more stress on the private sector.

Governments are seeking to reduce bureaucracies, and the role of ministries of health is shifting from direct delivery of care towards monitoring and regulation. Unfortunately, many ministries lack the structural and managerial capacity as well as the political strength to implement the necessary reorientation. Many are in fact starting to decentralize services to the district level, hoping this will lead to improved management, efficiency, accountability and responsiveness. The private sector is being given a greater role through such mechanisms as selling or otherwise disposing of public assets and making lump-sum subsidies, seconded personnel, tax-free equipment and bonus incentives available to nonprofit health care providers. Within this framework the public system is encouraged to compete for patients through policies which combine payment on a contract basis with free choice of provider by the patient. Thus government resources are tied to the consumer not to the facility. User fees are structured in such a way as to encourage patients to make effective use of health services.

Insurance is another way of financing health care. Social health insurance is generally compulsory, the premiums being paid by both the employer and the employee. Beneficiaries are principally those in formal employment. Private health insurance is normally voluntary and premiums reflect the level of risk of the insured individual. Community-based insurance schemes also cover the self-employed and those who are not in formal employment. They tend to be voluntary and some problems arise in enrolling poor people.

laria. It makes no sense to provide effective family planning but let people remain ill and contagious because they fail to complete their tuberculosis medication. Integration is the key to effective delivery of care.

There cannot be high-technology hospitals in every part of every country and there does not need to be. Instead, a tier system should be created, with established links between the various levels of the health services, with the peripheral health units seeing the majority of cases and feeding through to district-level hospitals, which in turn can refer patients to more specialized centres if need be.

It is also important for the infrastructure to provide health promotion and disease prevention as integral parts of the services, rather than only concentrating on curative medicine.

It is only when services are integrated, and the duplication of staff and equipment eliminated, that the costs of health care delivery can be seen for what they are – excellent value for money. With good infrastructure it is possible to demonstrate that lives can be saved in many cases for a few cents.

Half the world's population still lacks regular access to the most needed essential drugs.

Essential drugs and pharmaceuticals

Half the world's population still lacks regular access to the most needed essential drugs. Poorly coordinated drug policies and strategies, inefficient procurement, inequity in distribution, inadequate assurance of quality, unaffordable prices and inappropriate use are commonplace.

Drug promotional practices and a lack of objective therapeutic information continue to cause concern especially in developing countries, many of which do not yet have a national drug policy and the necessary capability to deal with these problems. Meanwhile in many countries the demand for drugs is growing while resources decrease. Without access to essential drugs, health care systems cannot function. Developing countries in particular need international support in assuring drug and vaccine quality.

Traditional medicine

Traditional medicine continues to be an important part of health care in many developing countries, and various "alternative" or complementary therapies enjoy a widespread following in developed countries. Traditional medicine has not, however, been incorporated into most national health systems, and the potential of services provided by traditional practitioners is far from being fully utilized. There is a continuing need for better assessment of the benefits of alternative forms of medicine including traditional ones.

Rationing of health care

When expectations rise and sophisticated technology is available but money is short, what treatments should be rationed? If there has to be a choice between who lives and who dies, how is it to be made? An experiment in Oregon (USA) of trying to draw up a list of essential treatments and a list of treatments that would not be offered was criticized as being a mechanistic approach to health care. The World Bank's *World development report 1993* on investing in health proposes that in poor countries there should be no complex heart surgery, no treatment other than pain relief for cancer, no provision of expensive drugs for HIV/AIDS and no intensive care for severely premature babies. This proposal was criticized as applying a balance-sheet mentality to health care. But the question of setting priorities and the need for rationing will not go away. With an aging population and advancing medical technology it is only a matter of time before this issue, with all its ethical implications, comes to the fore (*Box 11*).

Least developed countries and debt relief

The 47 countries which are designated as least developed share similar burdens – hostile environments, endemic diseases, poverty and huge debts. They have inadequate access to whatever health services are available, the lowest

levels of literacy and the highest rates of sickness and death (*Table* 6). But no country can provide adequate health services without resources to pay for them. Total donor aid to the least developed countries was estimated at around $17 billion a year in 1991. Their collective debts amounted to some $114 billion, and annual repayments were around $4.4 billion. Without debt relief the burdens on them will certainly increase, as will the misery of many millions of their citizens.

Conclusions

The problems outlined in this report are of awesome magnitude, but they are not insoluble. As Helen Keller said, "Although the world is full of suffering, it is also full of the overcoming of it". The potential exists; what is needed is a universal awareness of the problems and the collective will to solve them.

It is not inevitable that millions of children should die of preventable diseases, or that hundreds of millions of

Box 11. From medical ethics to social ethics

Since antiquity, the doctor/patient relationship has been governed by systems of medical ethics drawn from the Hippocratic, Chinese, Indian and other traditions. All held that the patient's good transcended other considerations. The physician determined what was the patient's good. Modern codes have added a social dimension, a responsibility for the health – the good – of society and humanity in general, and a concern for justice. Health for all, with its emphasis on social justice, on the equitable allocation of resources and on the responsibility of communities and individuals for their own health, is an expression of this change, and thus represents an ethical as well as a social goal.

The transformation of medical ethics has been stimulated partly by the progress of medical biotechnology and partly by profound social changes, associated with a recognition of human rights and freedoms, and of individual autonomy. Many medical choices can no longer be made purely on the basis of medical science. The emphasis on the social good has confronted lay individuals, whether policy-makers or patients, with ethical decisions and choices, requiring them to share with or often replace the physician or the scientist in determining what is ethically acceptable and good, to balance the patient's interests with those of society.

The explosion of expensive medical technologies, often of limited value to the patient, and the rise in people's expectations, have accentuated the problem of making the best use of limited resources. Policy-makers must set priorities to guide the allocation of resources among health goals and between health and other social goals. They do so under many pressures – social, economic, political, technological and ethical. They are forced to make choices with often tragic consequences. In principle medicine can use the full potential of modern biotechnology – for transplanting organs, for assisting reproduction, for postponing death, for reducing hereditary diseases, even for manipulating the genetic make-up of human beings. In practice the policy-maker, by controlling resources and trying to reflect the dominant values of society, determines how much medicine can do, and even which patients may benefit. Thus the good of society and individual good may come into conflict.

For their part individual patients today exercise autonomy and informed consent in deciding whether or not to accept or continue with treatment, even to continue to live, to become a subject of research, to permit the use of personal health data for study purposes, to be told – or not told – the truth, to permit the use of embryos, to donate organs and to withdraw life-support systems.

Individuals, like communities, are often the subjects of research, such as trials of drugs or vaccines or epidemiological studies. Some living in deprivation or even oppression are liable to exploitation. Researchers have a particular ethical responsibility to safeguard the rights of such people and to observe scrupulously the ethical principles of beneficence, avoidance of harm, and justice. WHO has mechanisms for assuring the ethical soundness of research with which it is associated, and seeks at the same time to strengthen national capacities for addressing ethical issues relating to health policy and research. WHO's main partner in this respect is the Council for International Organizations of Medical Sciences. Together the two bodies have over the years convened a series of conferences on health policy, ethics and human values, and prepared ethical guidelines for biomedical and epidemiological research.

Health for all, a new and universal concept, has exerted a profound influence on health development during the last decades of this century. Equity is now seen as the major policy and ethical requirement in organizing, financing and managing health care systems. Although approaches to ethics necessarily differ, since they depend on evolving cultural patterns, social beliefs, forms of community organization and religious convictions, WHO is endeavouring to elaborate certain universal principles. In this respect the Organization's role is not to rule on what is right or wrong, but to promote dialogue between different schools of thought and to strive for consensus.

Table 6. Comparative data for selected high-income countries, severely indebted low-income countries in 1991, and other least developed countries

WHO Member States (ranked by GNP per capita)	Population (000) 1993	Life expectancy at birth 1993	Infant mortality rate 1993	Under-5 mortality rate 1992	Physicians 1989-1991		Nurses 1989-1991		Health expenditure per capita (US$) 1990	GNP per capita (US$) 1992[a]	Adult literacy rate (both sexes) 1990	Adult literacy rate (female) 1990
					Number	Rate per 100 000 population	Number	Rate per 100 000 population				
High-income countries												
Japan	124 959	79	5	6	204 690	164	...	...	1 538	28 190	...	...
United States of America	257 840	76	8	10	606 680	238	...	...	2 765	23 240	...	...
France	57 379	77	7	9	169 051	300	...	...	1 869	22 260	...	...
Low-income/severely indebted countries (excluding least developed countries)												
Ghana	16 446	56	80	170	628	4	3 998	27	15	450	60	51
Nigeria	119 328	53	95	191	17 954	17	64 503	61	10	320	51	40
Kenya	26 090	59	65	74	1 063	5	2 692	11	16	310	69	59
Low-income/severely indebted countries (least developed countries)												
Mauritania	2 206	48	116	206	127	6	886	44	18	530	36	27
Liberia	2 845	55	126	217	...	...	...	...	14	(460)	40	29
Zambia	8 885	45	82	202	...	...	...	...	17	(450)	73	65
Mali	10 137	46	158	220	...	...	...	...	15	310	32	24
Niger	8 529	47	123	320	142	2	2 036	26	16	280	28	17
Madagascar	13 259	56	110	168	1 392	12	3 124	26	7	230	80	73
Zaire	41 166	51	93	188	2 496	7	27 601	74	5	(230)	72	61
Guinea-Bissau	1 028	44	139	239	...	...	...	...	16	220	37	24
Burundi	5 995	48	105	179	317	6	...	...	30	210	50	40
Uganda	19 246	43	101	185	704	4	2 332	14	8	170	48	35
Sierra Leone	4 494	43	142	249	...	...	...	...	4	160	21	11
Somalia	9 517	47	121	211	...	...	...	...	8	(120)	24	14
United Republic of Tanzania	28 783	51	100	176	...	...	...	...	4	110	...	...
Sudan	27 407	52	98	166	...	...	...	...	34	...	27	12
Myanmar	44 613	58	81	113	3 242	8	...	...	...	...	81	72
Other least developed countries												
Botswana	1 352	61	60	58	...	...	...	...	139	2 790	74	65
Vanuatu	161	...	...	...	15	10	...	...	67	1 210	...	...
Samoa	158	...	...	...	50	32	...	...	20	940	...	...
Cape Verde	395	68	42	...	...	...	...	...	64	850	67	...
Solomon Islands	354	70	27	...	52	16	447	140	117	710	...	...
Kiribati	75	...	...	...	14	20	116	163	...	700	...	...
Lesotho	1 882	61	78	156	74	4	874	50	28	590	...	...
Yemen	12 977	53	105	177	2 640	23	6 480	55	20	(520)	...	...
Comoros	607	56	88	...	57	10	155	29	28	510	...	...
Guinea	6 306	45	133	230	773	13	...	...	17	510	24	13
Maldives	234	64	54	...	15	7	...	...	...	500	...	...
Benin	5 075	46	85	147	323	7	1 384	31	19	410	23	16
Central African Republic	3 258	47	104	179	113	4	259	9	18	410	38	25
Togo	3 885	55	85	137	319	9	1 187	33	18	390	43	31
Haiti	6 893	57	86	133	...	...	...	...	27	(380)	53	47
Gambia	932	45	131	...	...	...	...	...	22	370	27	16
Sao Tome and Principe	127	...	...	...	61	51	233	196	38	360	...	...
Equatorial Guinea	379	48	116	...	99	28	154	44	28	330	50	37
Burkina Faso	9 788	48	116	150	252	3	909	10	7	300	18	9
Lao People's Democratic Republic	4 605	51	96	145	945	22	...	...	5	250	...	...
Rwanda	7 789	47	109	222	272	4	835	12	10	250	50	37
Bangladesh	122 210	53	107	127	...	...	...	...	7	220	35	22
Chad	6 010	48	121	209	147	3	86	2	12	220	30	18
Malawi	10 694	45	140	226	186	2	284	3	11	210	...	...
Cambodia	8 997	51	115	184	...	...	...	...	...	(200)	35	22
Bhutan	1 650	49	125	201	141	9	233	15	10	180	38	25
Nepal	21 086	54	98	128	1 124	6	601	3	7	170	26	13
Ethiopia	48 791[b]	...	...	208	...	...	...	...	4[c]	110[c]	...	...
Mozambique	15 322	47	143	287	388	3	2 847	20	5	60	33	21
Tuvalu	13	...	...	...	...	...	...	...	...	...	...	...
Afghanistan	20 547	44	161	257	2 233	13	1 451	9	...	...	29	14
Djibouti	481	49	111	...	...	...	...	...	...	...	...	...

Source: Berthlemy JC, Lourc'h A. *Debt-relief and growth.* Paris, OECD Development Centre, 1994.

[a] Figures in brackets reflect the most recent estimate for the period 1987-1992.

[b] Excludes Eritrea.

[c] Includes Eritrea.

... Data not available or not applicable.

Box 12. New and re-emerging infectious diseases

Some infectious diseases such as malaria, once thought to be on the verge of elimination as a public health problem, remain leading causes of death worldwide. The incidence of some has increased within the past two decades, and others pose a growing threat. A number are caused by hitherto unknown agents, such as hantavirus pulmonary syndrome.

Notable among the new and re-emerging diseases are infection by *Escherichia coli* O157:H7, which has provoked foodborne outbreaks of severe bloody diarrhoea and kidney failure in several countries; multidrug-resistant pneumococcal pneumonia, which particularly affects children; cholera caused both by classical strains and by new biotypes – as recently illustrated among Rwandan refugees; dengue and the more severe dengue haemorrhagic fever, a life-threatening disease endemic in many parts of Asia and increasingly common in the Americas; and cryptosporidiosis, a waterborne cause of diarrhoea that affected over 400 000 people in a single outbreak in the USA in 1993.

Many factors, or combinations of factors, can contribute to disease emergence. New infectious diseases may result from the evolution of existing organisms; known diseases may spread to new geographical areas or new populations; or previously unrecognized ones may appear in persons living or working in areas undergoing ecological changes such as deforestation or reforestation, which make them more exposed to insect, animal or environmental sources of infection. Re-emergence of infectious diseases may result from the development of antimicrobial resistance in existing agents (e.g. gonorrhoea, malaria, pneumococcal disease) or a breakdown in public health measures against previously controlled infections (e.g. cholera, tuberculosis, pertussis).

Other causes include changes in lifestyle, particularly in overcrowded cities where population growth has outpaced supplies of clean water and adequate housing; the dramatic growth of international travel, which allows a person to be infected in one country and become ill in another distant corner of the world; and changes in food handling and processing which mean that foodstuffs may have originated thousands of miles away or have been prepared from many different animals.

To confront this challenge WHO seeks to strengthen global surveillance of infectious diseases; build international infrastructure to recognize, report and respond to new disease threats; create an applied research programme focusing on practical problems and realistic solutions; and reinforce prevention and control through targeted interventions.

Current WHO activities include regional and local projects on urban mosquito control to reduce the risk of dengue and yellow fever; research to develop new or improved vaccines for emerging diseases, and better methods of administering the products already available; collaborative projects and provision of grants to strengthen reference laboratories and WHO collaborating centres, which are the first lines of defence; and provision of training for technology transfer.

people should not have access to safe water or sanitation. Why, at the close of the 20th century, should huge numbers of women still be dying in childbirth? Why do we allow even greater numbers of children to become brain-damaged because of a lack of iodine in their salt, or to go blind because of a lack of vitamin A?

Although this assessment of global health status has been limited by a scarcity of epidemiological and other data, certain conclusions can be reached based on the most reliable information at our disposal.

The most powerful image that emerges is of widening gaps in health between the haves and the have-nots. Gaps not just between rich and poor, but between the poor and the poorest of all. Gaps not just between regions and countries, but between populations within those countries. There is a neglected underclass not just in every country, but in virtually every city. They are the street children, the unemployed, the elderly and the marginalized – including millions of women whose greatest disadvantage is their gender. There are also flagrant gaps in access to health care, between taking sophisticated national health services for granted and dying for want of a midwife.

The widening gaps in health status and in access to health care among countries and population groups far outdistance the gains made in global health improvements, and threaten the sustainment of those gains.

Globally life expectancy at birth has increased to about 65 years while mortality among infants and children under age 5 has fallen to about 62 and 87 per 1 000 live births respectively. However, the increase in life expectancy has been gained at a price: the extra years are accompanied by pain and a loss of dignity. Any comfort that can be derived from longer life expectancy must be tempered by the knowledge that about 6% of deaths in the world each year are still among children less than one week old.

At least 45 countries, with a total population of 850 million or about 15% of the world population, have not yet

reached the minimum targets of life expectancy at birth of at least 60 years, and of mortality among infants and children under age 5 of below 50 and 70 per 1 000 live births respectively (see *Annex 3, Table A*).

The 80% immunization coverage in 1990 of infants against vaccine-preventable diseases is falling, possibly due to financial constraints in procurement of vaccines. Yet immunization, at a cost of roughly $10 per child, has protected more than 100 million infants over a 10-year period, and saved more than 20 million lives at a cost of about $1 billion. How much really is a billion dollars? About the same, in fact, as is spent on beer every 12 days in the USA, and by Europeans on cigarettes every 5 days.

There is a need to shift emphasis from preventing death to preventing ill-health and enhancing quality of life.

Infectious and parasitic diseases are the leading causes of death worldwide. As campaigns for the global eradication of poliomyelitis, measles and neonatal tetanus move forward, and leprosy nears elimination as a public health problem, the major challenge is to enable those suffering from these diseases to be economically and socially productive. Similarly drug resistance will pose a challenge in the control of malaria and tuberculosis.

Alongside the pandemic of HIV/AIDS, the world is witnessing a re-emergence of diseases such as cholera, dengue haemorrhagic fever and plague (*Box 12*). Developing countries are bent low under a double burden of ill-health: while still struggling against major communicable diseases, they are having to contend with an expansion of noncommunicable diseases such as cancer and cardiovascular diseases as well as a surfeit of accidents and violence.

An aging population as well as rapid urbanization, particularly when accompanied by growth of urban slums, will be a driving force in future health development. Greater demands on land, with a depletion of natural resources, and on the working population – due to elderly dependency – are casting a worrying shadow, in respect not only of health but also of social development generally.

Although the global economy and agricultural production, particularly related to cereals, are growing faster than the population – a trend that is likely to continue – it is not the least developed countries that are benefiting; in fact they are being left behind.

The link between population, development, environment and health is so strong that health policy is no longer confined to the conventional health sector; more and more it is influencing – and being influenced by – social policy and ethical concerns.

The momentum generated by the global strategy for health for all by the year 2000 in ensuring more equitable access to health and health care has to be sustained and accelerated in a changing world. There is a need to shift emphasis from preventing death to preventing ill-health and enhancing quality of life. Allowing individuals to achieve their full health potential enables them to be economically and socially productive.