

Chapter 3

Health across the life span

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This chapter looks at trends and developments in health throughout the life span, dealing with four specific age groups – infants and small children; older children and adolescents; adults up to the age of 65; and older people, with a special focus on women's health.

Infants and small children

Viewed globally, the improvements in infant and child health in the past 50 years have been nothing less than spectacular, and appear likely to continue into the next century. For example, 210 of every 1000 babies born in 1955 died before their fifth birthday – a total of 20.6 million deaths in that year. By 1995 the death rate had fallen to 78 per 1000 (10.6 million deaths) and should decline further to 37 per 1000 by 2025, when it is projected that the total deaths will be 5.1 million.

In measuring the trends of the past 50 years, the reasons for both success and failure have to be understood in order to achieve further progress and to eliminate the gross disparities that persist between and within countries. Three dimensions of health development need to be taken into account: the epidemiological patterns of disease and deficiencies – including the interactions of diseases and deficiencies and the mortality levels; the social, economic and health infrastructure; and the priority strategies and adequacy of the actions taken to address the preventable and

treatable causes of death and illness in infancy and childhood.

Overall reductions in under-5 and infant mortality are accelerating in much of the world. However global, regional and even national data often hide variations between and within countries that are important for health policies and programmes both globally and locally. The fate of a child is determined by its biology and its environment. Its risk of dying is influenced biologically by its gender, its natural defences and its nutrition; and by its physical, microbial, social and cultural environments.

The living conditions of families, the prevalence and modes of transmission of infectious disease agents and the nutritional status of the child are among the strongest immediate determinants that set the different levels of under-5 mortality rates around the world. Substantial improvement in at least one, but preferably all three of these elements is required in order to effect a significant overall decline in the rates.

The decline in deaths among the under-5s in the developed countries since the late 1940s is largely attributable to improvements in sanitation, water supply, housing, food supply and distribution and general hygiene. Childhood diseases such as diphtheria, scarlet fever, and rheumatic heart disease were in steady decline well before vaccines and antibiotics became widely available.

A similar decline in specific diseases is occurring now in the developing world, mainly as a consequence of general improvements in sanita-

tion, water supply, education and access to preventive and curative health care in the community. These improvements are similar to those that took place in the developed economies of Europe and North America 50-80 years ago. However, progress has been more rapid due to the historical lessons learned and the advent of new knowledge and technologies that influence prevention, treatment, nutrition and fertility regulation.

Unfortunately, the progress recorded is not the full picture. Many countries – the least developed – have been unable to make or sustain similar progress over the years. In a few countries, child mortality levels are still above 200 per 1000 live births, and in others the levels are declining slowly, at a rate of no more than 1-2% per year.

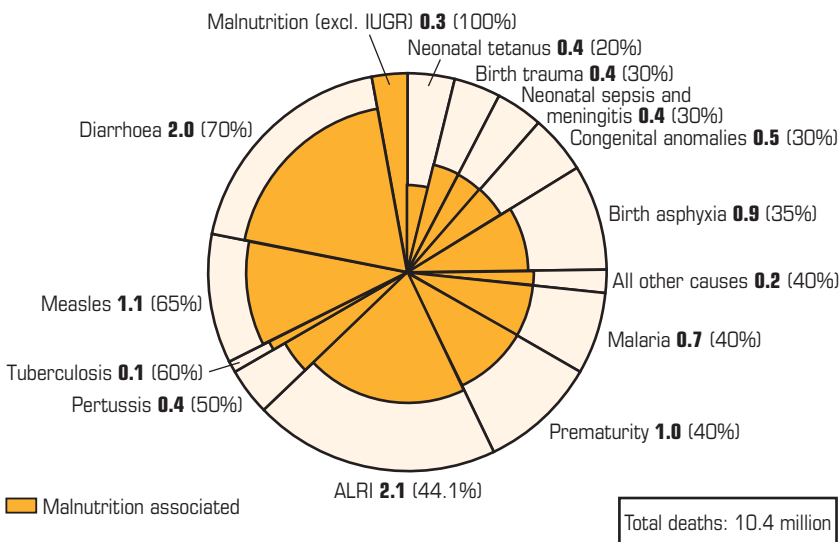
About 10 million children born in 1997 will die before reaching their fifth birthday. Although this is barely half

the toll of 21 million such deaths in 1955, it remains unacceptably high. In the developing world in 1995, about 7.5 million of these children died from one or, frequently, more than one of five conditions: malaria, malnutrition, measles, acute respiratory infections and diarrhoea (*Fig. 8*). Other major causes are related to pregnancy and childbirth, sepsis, neonatal tetanus and AIDS. Often it is impossible to know which actually killed the child, because of difficulties in distinguishing the signs and symptoms of some of these diseases from one another. In many of the least developed countries, the odds are still heavily stacked against the child's survival.

The everyday nature of these deaths disguises the complex sequence of events leading to them – the remorseless process of repeated episodes of infections, often sequential, not infrequently concurrent. Each episode is accompanied by loss of appetite and decreased food intake, and each time the illness itself makes increased demands on the child's energy. Local health care facilities, if they exist, may be ill-equipped and poorly supplied, and inadequately staffed, with patterns of care that are rarely optimal and may even be harmful. Often, the child struggles for life in a highly crowded, unhygienic and poorly ventilated environment that facilitates the transmission of respiratory infections and malaria.

The tragedy is that most of these deaths in the under-5s could be prevented and the conditions treated within the resources of most, although not all, countries. The greatest positive impact on child mortality results from a combination of immunization, improved maternal health, family planning, and improved nutrition – interventions that affect nutritional status and prevent or provide effective treatment for the common infectious diseases of childhood.

Fig. 8. Main causes of death among children under age 5, developing world, 1995^a



Disease clusters

Neonatal and perinatal causes. Neonatal tetanus, birth trauma, neonatal sepsis and meningitis, congenital anomalies, birth asphyxia, prematurity.

Integrated management of childhood illness. Malaria, acute lower respiratory infection (ALRI), measles, diarrhoea, malnutrition.

^a Number of deaths in millions followed by % malnutrition-associated deaths in brackets.

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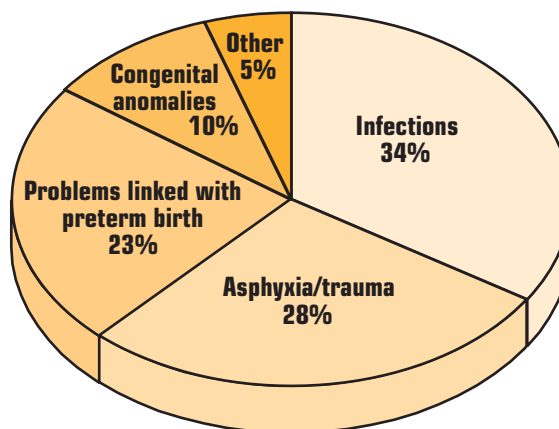
Infant mortality rates are composed of two biologically and epidemiologically distinct components. The first is neonatal mortality, which is largely influenced by the health and care of the mother before and during pregnancy and during delivery, and the care of the infant in the postpartum period. The second is the postneonatal period, which is largely affected by environmental factors, feeding and other aspects of care. Historically, infant mortality rates are declining from previously high levels, even in the absence of specific technical interventions.

Neonatal mortality refers to deaths of infants between birth and the seventh day of life – the early neonatal period; and from the 8th to the 28th day of life – the late neonatal period.

Perinatal mortality refers to deaths of babies after 22 completed weeks of gestation, during birth and during the first seven days of life – the perinatal period. Fetal death or *stillbirth* is death prior to the complete expulsion or extraction from the mother of the fetus, irrespective of the duration of pregnancy.

About 9 million babies are either born dead or are born alive only to die within their first 28 days of life. While the causes of about 4 million stillbirths occurring worldwide are difficult to assess, research shows that nearly half of all stillborn babies have died as a result of maternal complications during labour and delivery. Many stillborn babies would have been perfectly normal infants if appropriate care had been given at birth. The longer the baby survives, the more likely it is that the death will be due to causes other than those related to pregnancy and delivery. More than two-thirds of the nearly 4.8 million newborn deaths are among fully developed babies born at term and apparently well equipped for life; how-

Fig. 9. Causes of neonatal death, 1995



ever, at least 4 out of 5 newborn deaths are due to infection, birth asphyxia, birth injury and problems linked to preterm birth (Fig. 9). Congenital anomalies, usually thought to be the main cause of death in babies, account for a relatively small percentage of these deaths. Helping these babies to survive and grow up into healthy adults does not require expensive technology. Good newborn care at birth does not require sophisticated equipment; it calls for a set of simple preventive measures and a little prompt extra care (Box 11). WHO's Mother-Baby package lists straightforward and simple interventions at various stages of pregnancy, and during and after birth, that are known to improve the health and save the lives of mothers and babies.

Controlling childhood diseases through immunization

The world continues to underuse the most cost-effective public health intervention of all – immunization. It is unacceptable that at least 2 million children still die each year from diseases for which vaccines are available at low cost. Immunization has been

Box 11. Essential newborn care

All newborn babies need basic care: cleanliness, warmth, early and exclusive breast-feeding, eye care, immunization, resuscitation when necessary.

Some newborns need special care: sick newborns need early recognition of danger signs, prompt treatment.

Preterm and low birth weight infants need more cleanliness, more warmth, more attention to breast-feeding, more effective recognition and treatment of infections.

responsible for the most dramatic changes in child health in the last few decades. Vaccines have prevented death, disease and disablement among hundreds of millions of children.

In 1948, immunization programmes were largely restricted to industrialized countries, and even then were often partially implemented. It was not until the formation of WHO's Expanded Programme on Immunization in 1974, when less than 5% of children were being immunized, that developing countries began to create national schedules and programmes. Now, only around 20% of the world's children remain unimmunized. First smallpox was eradicated. Since then, as coverage for each of the childhood vaccines rose, disease incidence fell. Large outbreaks previously experienced in almost every country are now less frequent and of lower intensity.

From 1981 there was a fourfold increase from approximately 20% to reach the 1990 goal of 80% immunization coverage among infants worldwide with BCG, measles, and the third dose of DPT (diphtheria, pertussis, tetanus) and oral poliovirus vaccines. An estimated 3 million young lives were saved from measles, neonatal tetanus and pertussis in 1990 alone. By 1995, over 80% of the world's children had been immunized against diphtheria, tetanus, whooping cough, poliomyelitis, measles and tuberculosis. During 1995, in addition to the 500 million routine immunization contacts with children under 1 year of age, a record 300 million children throughout the world – almost half of those under the age of 5 – were immunized during mass campaigns against polio.

Despite these successes, children are still slipping through the safety net. For example, even though globally 80% of children are immunized against measles, vaccination cover-

age is variable. There are frequently pockets of low coverage, especially among the urban poor, where children are in frequent contact with each other and easily transmit disease. Many years have elapsed between the invention of vaccines and their widespread use today in immunization programmes. Fortunately, the interval between successful field trials and large-scale application is shortening. It took smallpox nearly two centuries to be eradicated. But after 35-40 years, polio is well on the way to eradication, and it is only about 30 years since measles immunization began (*Box 12*).

Large epidemics of **poliomyelitis** occurred regularly in the 1950s in all industrialized countries, causing panic among parents and crippling thousands of children every summer. Following the development and widespread routine use of anti-polio vaccines, the disease rapidly disappeared in industrialized countries and was eliminated as a public health problem there in the early 1960s. However, epidemic poliomyelitis continued to be a major public health problem in most developing countries. The incidence of paralytic polio in the developing world began to decrease only after routine immunization of infants with oral polio vaccine (OPV) in the late 1970s.

Virtually all endemic countries in the world have now begun to implement the WHO-recommended strategies to eradicate polio – supplementary mass immunization with OPV and surveillance for acute flaccid paralysis. Polio has been eradicated from the Americas since 1991, and is on the verge of eradication in Europe and the Western Pacific. The major reservoirs of wild virus transmission are in South Asia and sub-Saharan Africa, although eradication activities are progressing in virtually all endemic countries of these regions.

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During national immunization days in 1997, supplemental OPV was provided to almost two-thirds of the world's children under 5, that is to more than 400 million children. To monitor progress towards eradication, establishing and improving surveillance for acute flaccid paralysis has now become an urgent priority. The development of systems for the surveillance of flaccid paralysis often lags behind the implementation of national immunization days, and major efforts are needed in many countries to increase the quality of such surveillance.

Countries with the lowest immunization coverage are nearly always countries with internal conflicts. Infrastructures are weakened or destroyed, resulting in large numbers of children remaining unimmunized and in outbreaks of vaccine-preventable diseases. Intense efforts to accelerate polio eradication in such circumstances include using such techniques as “days of tranquillity” when fighting stops to allow immunization to take place. Polio-free countries and areas are increasingly at risk of reinfection from countries which remain endemic; should this occur, it will delay the global eradication goal. The full benefits of global eradication will be realized only when polio has been eradicated from the most remote areas of all countries. Eradication by the year 2000 or soon thereafter remains feasible, provided that adequate additional funding is made available and the current momentum of polio eradication activities can be maintained.

By 1996, estimated *measles* morbidity and mortality worldwide had fallen by 78% and 88%, respectively compared to the pre-vaccine era. During the 1990s, the widespread use of innovative measles control strategies in the Americas and countries as diverse as Mongolia, South Africa and

Box 12. Eradicating measles through immunization

Based on implementation of a combination of measles immunization and surveillance strategies, countries are considered to be in one of three stages:

- **Control.** Reduction of incidence and/or prevalence to an acceptable level as a result of deliberate efforts, requiring continued control measures. The objective is to achieve high routine coverage with one dose of measles vaccine among infants to reduce measles morbidity and mortality.
- **Outbreak prevention.** Aggressive immunization strategies have prevented forecasted measles outbreaks.
- **Elimination.** Reduction of incidence to zero as a result of deliberate efforts, requiring continued control measures.

In the Americas, WHO has implemented a periodic mass immunization strategy combined with strengthening of surveillance to interrupt measles transmission and eliminate the disease by the year 2000. Other regions and countries have implemented or are considering the implementation of strategies aimed at interrupting measles virus transmission. Recently, the WHO Eastern Mediterranean Region has pledged to eliminate measles by the year 2010, and the European Region is planning to do so by the year 2007. In the future, the sum of all regional efforts towards elimination will result in the global eradication of measles, obviating the need for further control measures.

From 1977 to 1990, the global reported coverage with one dose of measles vaccine administered through routine services increased from approximately 5% to 80%, and then remained stable at that level until 1996.

The results of recently published studies indicate that the current WHO policy of offering vitamin A at the same time as measles vaccine to 9-month-old infants is appropriate, safe and effective. The benefit of administering vitamin A in cases of measles at any age has never been questioned and continues to be recommended by WHO as part of the integrated management of childhood illness.

Despite the widespread availability of safe and effective measles vaccines since 1963, measles still accounts for 10% of the global mortality from all causes among children aged under 5 years. Although measles eradication is technically feasible, programmatic, political and financial obstacles must be overcome before the goal of eradication can be achieved.

the United Kingdom demonstrated that high-level measles control and even interruption of transmission is feasible over large geographical areas. The evaluation of these country and regional elimination strategies will provide valuable information for developing a global measles eradication strategy. While the current measles vaccine is one of the safest, most ef-

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fective and cost-effective vaccines ever developed, plans are in hand to develop a more heat-stable vaccine which could be used in mass campaigns, would not need the cold chain and could be administered without needle and syringe.

Tetanus of the newborn is the third killer of children after measles and pertussis among the six EPI vaccine-preventable diseases. While between 800 000 and 1 million newborns died from tetanus in the early 1980s, an estimated 730 000 such deaths are now prevented every year, particularly by targeting elimination efforts to high-risk areas. In 1997, there were an estimated 275 000 deaths.

Diphtheria is a respiratory infection transmitted through close physical contact, especially in overcrowded and poor socioeconomic conditions. In 1990, a large outbreak of diphtheria occurred in the Russian Federation and by the end of 1994, it had spread to all the newly independent States. At least 90% of all diphtheria cases reported worldwide during 1990-1995 were in these countries. The epidemic appears to be waning after massive immunization. This epidemic serves as a reminder of the danger of not maintaining immunization levels in a community.

Acute respiratory infections and diarrhoea

In the late 1960s, WHO scientists noted exciting developments in the treatment of cholera, in particular the treatment of patients using oral rehydration therapy (ORT), which depended on a solution made by dissolving dried salts in clean water, and avoided using expensive and hard-to-transport intravenous fluids. Field trials determined that it was feasible for peripheral health workers to use ORT

for the treatment of acute diarrhoea in children under 5. They also showed that children treated with ORT and feeding actually gained weight. Research in different countries confirmed the benefits and safety of ORT. Based on this information, WHO promoted the wide use of ORT to reduce mortality from the acute diarrhoea and associated malnutrition that was at the time claiming the lives of over 5 million children per year. In 1978, a new programme was established, combining research with the development of materials and support to establishing programmes in countries. In collaboration with UNICEF and numerous bilateral agencies, WHO assisted over 100 Member States to set up national programmes, define policy, plan activities and train health workers. By the mid-1990s, virtually all health workers were aware of ORT, even if they had not been trained in its use. Fewer dehydrated children were seen at health facilities as families learned to increase fluids and keep feeding children who were suffering from diarrhoea. Exclusive and prolonged breast-feeding was also found to be an effective, feasible intervention to prevent diarrhoea.

In the late 1980s it was shown that acute respiratory infections, mainly pneumonia, were the major killers of children aged under 5. Access to technology or expertise was limited, and many pneumonia cases went untreated. At the same time, children suffering from simple coughs and colds sometimes received antibiotics unnecessarily. Based on a simple approach to pneumonia detection developed in the early 1980s at a collaborating centre in Papua New Guinea, WHO developed and validated guidelines, and established a programme in 1984. The simplified standard case management became the basis of WHO's efforts to reduce

pneumonia mortality. Since then, the Organization has developed guidelines, tools and supportive technical documents for clinical management training, programme management and evaluation. Following a general trend towards integration, the programmes for control of diarrhoeal diseases and for acute respiratory infections were merged in 1990.

Integrated management of childhood illness

At the same time, research involving childhood diseases made it clear that single-disease approaches may not be the best for the child. A child does not arrive at the health facility as a “case” of something, but arrives sick, and may have several conditions at once. In some instances, the mother may bring the child in for a problem which may only be a minor manifestation of a dangerous illness. By 1990, it was well documented that most childhood deaths were caused by five conditions: as many as 70% of deaths could be attributed to diarrhoea, pneumonia, measles, malaria and malnutrition. The need for integration at health facilities to rationalize the task of health workers became increasingly evident. In 1992, WHO and UNICEF worked out clinical guidelines that integrated all five conditions. The resulting strategy is called integrated management of childhood illness. Research continues to improve integrated case management and to identify more comprehensive disease prevention activities, including the development and adoption of new vaccines.

In the view of WHO, although the formula for ORS is satisfactory, there may be an even better one. Experience in the field suggests that the process of detecting and managing pneumonia may need to be reviewed;

it may be possible to target antibiotics more effectively to only those children who will really benefit from them. Current efforts are aimed at the first-level health facility, but it is essential to convince the population of the need for urgent medical attention when children are sick.

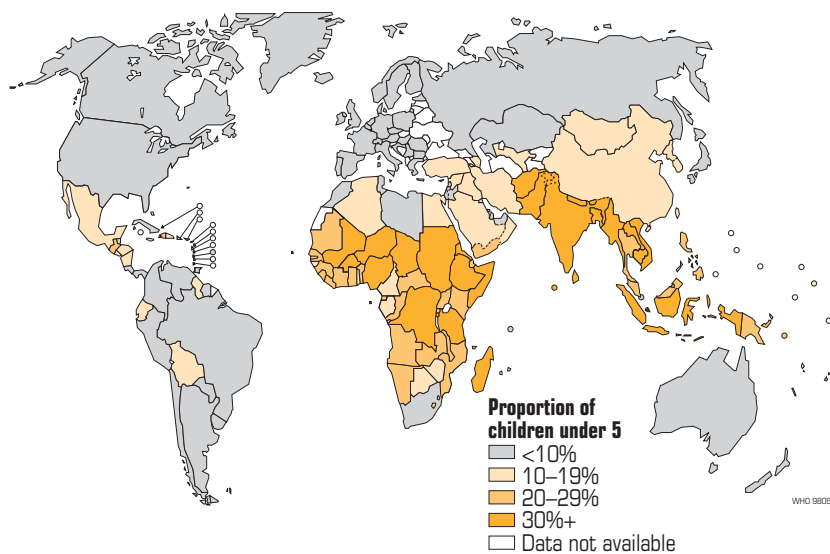
In addition, complementary strategies for the prevention of some of these diseases are also being promoted and supported. For example, for reducing the incidence of diarrhoea, they include promotion of optimal breast-feeding practices and of the “baby-friendly” hospital initiative, modifying complementary feeding practices, improving water supply and sanitation facilities and promoting personal and domestic hygiene. Adequate breast-feeding in a large number of settings is found to be associated with a 2.5-4-fold lower rate of mortality and less severe cholera and *Shigella* spp. infections. In respect of malaria, they include use of impregnated bednets which, even in the short term, have resulted in a 17-30% reduction in total malaria deaths in young children. For measles, immunization of infants has been an effective intervention for reducing incidence.

Low birth weight and nutritional deficiencies

Low birth weight is defined as a weight at birth of less than 2500 g (i.e. up to and including 2499 g), irrespective of gestational age. It has an adverse effect on child survival and development, and may even be an important risk factor for a number of adult diseases, including non-insulin-dependent diabetes and heart disease. While it is recognized that the etiology of low birth weight is multifactorial, emphasis is given to those maternal factors that are be-

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Map 6. Underweight prevalence among preschool children, 1995 estimates



lieved to be of greatest importance in developing countries and that might be amenable to change in the short term. These include poor maternal nutrition, certain infections, pre-eclampsia, arduous work after mid-pregnancy, short birth intervals, and teenage pregnancy. Tobacco and alcohol consumption are additional risk factors.

In infants whose birth weight is very low, the sucking and swallowing reflexes are poorly developed, the retina is easily damaged by high levels of oxygen and there is a risk of intracranial bleeding as a result of birth trauma. Birth weight is influenced by two major factors: duration of gestation and intrauterine growth rate. The preterm infant whose gestation period is less than 37 weeks is physiologically immature and at a higher risk of dying during the neonatal period.

Both during the newborn period and into infancy and childhood, low-birth-weight infants are at much higher risk of mortality and severe morbidity than full-term, full-sized infants. Compared to full-term infants, they have a 3-4 times greater

risk of dying from diarrhoeal diseases, acute respiratory infections and, if not immunized, measles. They are more likely to be malnourished at 1 year. By the age of around 5, the low-birth-weight child, probably having had more cyclic episodes of infection and malnutrition, may be severely stunted (*Map 6*). This growth deficiency will be carried into adult life and translated into reduced work output, and often impaired learning ability.

Globally, WHO estimates that 25 million low-birth-weight infants are born each year, constituting 17% of all live births, nearly 95% of them in the developing world. The incidence of low birth weight varies widely between regions of the world, with levels of 32% in southern Asia (but 9% in eastern Asia), 11-16% in Africa and 10-12% in Latin America and the Caribbean.

The increase in the survival of very low-birth-weight infants in industrialized countries, often with high rates of long-term developmental impairment, has generated an intense scientific and ethical debate about the implications of perinatal interventions which increase survival rate but also result in an increase in severe handicaps. Clearly there is need for further research in some of these areas. But the debate should not deflect attention from what can be done for the vast majority of women and newborns, even the majority of low-birth-weight infants, using simple technologies, good principles of public health and a rational organization of services based on the best knowledge. Perinatal health, together with maternal health and safe motherhood, will be one of the major challenges of the next decade.

Many children in developing countries are subject to multiple risks with, very often, a deterioration of their situation at the weaning period. Born with a low weight, fed with a

sub-optimal breast-feeding practice, they are at increased risk of protein-energy malnutrition. **Breast-feeding** is one of the most effective, low-cost interventions for neonatal health. Nothing but breast milk is required for the first 4-6 months of life, neither substitutes, nor supplements, nor even water. Even in developed countries breast-feeding lowers the rate of respiratory and gastrointestinal illness to one-fourth that of non-breast-fed infants.

Despite this knowledge, many hospitals and health workers continue to obstruct breast-feeding or fail to recommend it. Putting the infant to the breast just after birth decreases the risk of hypoglycaemia, eliminates the need for prelacteal glucose water and hastens the onset of full lactation. Allowing mother and infant to stay together 24 hours a day, with on-demand feeding, improves health and reduces the risk of disease even in the newborn period. Such a feeding pattern eliminates the epidemics of pathogenic *E. coli* and staphylococcal infections that used to sweep through newborn nurseries and eliminates the fatal necrotizing enterocolitis among very low-birth-weight babies.

WHO estimates that globally, exclusive breast-feeding rates remain low. An estimated 35% of infants are fed only breast milk at some point between birth and four months of age. As awareness of the advantages grows in both developing and developed countries, more Member States are taking steps to protect and promote breast-feeding, and rates are increasing. All too often, however, in countries where malnutrition and mortality are high, these rates remain low. Many countries (especially in Europe) continue to have low breast-feeding rates, although they are slowly improving.

WHO estimates that about one-third of the world's children are af-

ected by **protein-energy malnutrition**; 76% of these children live in Asia (mainly southern Asia), 21% in Africa and 3% in Latin America. As many as 206 million children in developing countries are stunted (stunting is associated with poor developmental attainment in children and functional impairment in adults). Efforts to accelerate economic development significantly will be unsuccessful until optimal child growth and development are ensured.

Iodine deficiency has been described as the world's single most significant cause of preventable brain damage and mental retardation. Iodine deficiency disorders affect about 14% of the world population, and 834 million people are affected by goitre. Iodine deficiency in the fetus, due to inadequate iodine status of the mother, is associated with a greater incidence of stillbirths, spontaneous abortions, congenital abnormalities, low birth weight, infant and child mortality, and may lead to cretinism. The IQ scores of iodine-deficient children and adults are lower than those of people who are not iodine-deficient. Significant improvement in mental development, school performance and motor development have been demonstrated with iodine supplementation of primary school children.

Childhood obesity and its consequences are emerging as a global problem. Data from 79 developing countries and a number of industrialized countries suggest that, by WHO standards (>+2 standard deviations above the reference median weight for height), about 22 million children aged under 5 are overweight. Obesity affects almost 10% of schoolchildren in industrialized countries and high rates are also emerging in some of the developing ones. Some 30% of obese children become obese adults.

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communicable diseases and conditions. WHO has initiated a review of associated morbidity and mortality with a view to developing guidelines for Member States on obesity prevention and management. Improved prevention of and therapy for childhood obesity are the most cost-effective approaches to reduce morbidity and mortality due to obesity in adulthood; three potential approaches for the preventive interventions to deal with this problem are reduction in dietary energy intake, increase in the energy spent on activity and reduction in inactivity. Children with potentially lethal complications of obesity such as sleep apnoea require rapid and sustained weight reduction. One possible approach in children is a carbohydrate-free diet under careful monitoring and follow-up. The role of drugs in the treatment of obesity is not clear. Some interventions aimed at both parents and children have been successful (e.g. modifications in diet, lifestyle activities and behaviour).

Other childhood diseases of public health concern

Rheumatic fever and rheumatic heart disease (the most common cardiovascular disease in children and young adults) are examples of how social and economic factors, and later health care and medical technologies, have contributed to and then accelerated the decline of a disease that was epidemic in developed countries a century ago. Limited evidence suggests that there has been little if any decline in the occurrence of rheumatic heart disease in developing countries over the past few decades.

Meningococcal meningitis occurs in all parts of the world. In the 1980s an epidemic wave of meningococcal meningitis spread over vast territories in Asia and Africa. Even in

non-epidemic years, at least 1 million cases of bacterial meningitis are estimated to occur and about 135 000 children die. About 300 000 of these cases and 30 000 deaths are due to meningococcal meningitis. In epidemic years the number of cases of meningococcal meningitis may double to 600 000 or more, with 60 000 or more deaths.

Asthma, a disorder of the airways, is one of the most common chronic diseases worldwide, with a prevalence rate among children ranging from 1.5% to over 12%. Rates are generally lower in developing countries but globally both prevalence and hospitalization rates have increased by 40% in the last decade. The long-term prognosis of childhood asthma is now a major concern. It has often been suggested that childhood asthma will “disappear” when the patient reaches adulthood. Epidemiological evidence is less optimistic. It has been estimated that 30-50% of children have asthma that disappears at puberty but often “reappears” in adult life. Between one-third and two-thirds of children with asthma continue to suffer from the disease through puberty and adulthood. Asthma in childhood is an example of a chronic disease which can impair children’s socialization, school performance and later life. Self-management and care are essential if the asthmatic child is to lead as normal a life as possible.

Paediatric AIDS is substantially underrecognized and underreported, because of difficulties in establishing the diagnosis of HIV infection in infancy, as well as clinical features overlapping with those of the other severe diseases of childhood. In 1997, about 95% of the estimated number of AIDS deaths in children under 15 occurred in the under-5 age group. Perinatal transmission has been well documented, with 15-35% of children of HIV-positive mothers being in-

fectured and accounting for the majority of children with AIDS. As almost half of all newly infected adults are now women, WHO projects that if current trends continue, by the year 2000, over 13 million women will have been infected and 4 million will have died of AIDS. Their uninfected infants will constitute a growing group of potential orphans, since most of their HIV-infected mothers will die of AIDS within 5-10 years of their birth. By the year 2000 as many as 10 million children under 10 may be orphaned as a result of maternal AIDS in sub-Saharan Africa alone, and projected infant and child deaths from AIDS may increase child mortality rates by as much as 50% in parts of sub-Saharan Africa. But the most alarming trends of HIV infection are in South-East Asia. In some high-prevalence communities, AIDS is already starting to reverse the long-term effects of child health initiatives. Many women are at particularly high risk of infection because of their low socioeconomic status, their difficult living situations and/or the fact that they do not have access to AIDS prevention information. Paediatric AIDS will increase accordingly.

Emerging public health priorities

Although mortality statistics are becoming more reliable, little is still known concerning morbidity of children in different settings. It is crucial to get accurate data – or at least *estimates of morbidity* – in order to train personnel, to prepare relevant programmes and services and to evaluate their performance. The ongoing epidemiological transition in the developing world makes it even more important to target morbidity in order to be successful in combating childhood diseases through ap-

propriate care, including prevention.

The common infectious diseases of childhood are coming under control through a combination of health promotion, prevention and simplified standard treatment regimens. But at the same time, the healthy growth and development of many children is threatened by very rapid, often disruptive social, cultural and economic changes. The emerging *new morbidity* is mainly of a psychosocial nature with a very low mortality rate, except from suicide. It is of increasing importance worldwide: very common in the developed world, and not rare in the developing one. A more refined approach to disease problems is badly needed, since prevention and care should adapt to this interacting process. Globally, the new morbidity is strongly associated with behavioural problems and is therefore much more difficult to prevent than the diseases that have been known for centuries. Countries in an intermediate state of socioeconomic development are accumulating classical and new morbidity and are facing great difficulties as regards the care of the sick.

In terms of emerging morbidity, AIDS represents the most crucial challenge because of its impact on women, children and families. However, other problems should not be overlooked: substance abuse during pregnancy with its harmful effects on both mother and child, and accidental injuries, by far the first cause of potential years of life lost. Accidental injuries are only one of the ill-effects of violence: if other causes are added such as child abuse and neglect, *violent morbidity* is becoming more of a burden. Child abuse and neglect include four distinct conditions: physical abuse, neglect, emotional abuse and sexual abuse. They occur within and outside family settings, in the latter case sometimes in an insti-

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Box 13. Healthy child development

Child development concerns not merely physical health but also the process of change whereby a child learns to handle ever more difficult levels of moving, thinking, speaking, and relating to others. In its first year of life, the infant needs to develop a sense of trust in the world. A consistently nurturing and tension-free environment provides the infant with a sense of security. This critical process is usually achieved by 13 months of age.

Unfortunately the health sector, not always appreciating the life-long impact of the interactions of nutrition, child care and nurturing on cognitive and social development, has done little to foster parenting and child care beyond meeting the survival and physical needs of children. Where child development programmes exist, they usually start at the already late age of 3 or 4 years.

The best child development programmes are aimed at strengthening the capacity of mothers, through home visiting and child stimulation from infancy until the age of 3. Early child stimulation interventions within the first year of life have their greatest impact on the most disadvantaged groups and populations, attenuating the effects of poverty, severe malnutrition, low birth weight and prematurity.

Research shows clearly the intimate linkages between physical growth and psychological development, and the powerful relationships among growth, development, health, and care-giving. The mechanisms that promote physical and mental development are not unidirectional from care-givers to children; in fact it is the interaction between the two that is critical. Better-nourished children tend to be more active and able to explore the environment and elicit more interaction from parents, and may be more effective in demanding and getting food. In addition, the care-giving activities within the home that affect child nutrition and psychosocial development are closely related: a major part of giving care to infants and toddlers is simply feeding.

Many households in conditions of poverty still have the resources to provide adequate diets for children and to use good feeding practices. However, they need the knowledge and skills to do so. Families who are severely constrained economically will also need access to food and dietary supplements. Finally, families need help in improving the interactions between care-giver and child, especially the malnourished child.

In general, progress in child health and development will remain frustratingly slow if the national and international health bodies focus only on the medical model of public health strategies directed at the one in 13 children in the developing world who die before reaching the first year of life. It is the legacy of malnutrition, continuous non-fatal illness, and lack of social and environmental stimulation to development that perpetuates the health and social deficits that are transmitted to the next generation, repeating the statistical pattern of one in 13 dying, but 12 of 13 surviving in misery and with prospects of a blighted future.

tutional or non-institutional setting. Child abuse mortality rates for infants in most countries are estimated at around 7 per 100 000 live births, providing a rough global estimate and indicating only the "tip of the iceberg". Although childhood accidents, injuries and disabilities have been recognized as a major problem, meaningful estimates of their incidence worldwide are not available. Greater medical knowledge and better technology mean that more children survive premature birth, congenital malformation, accidents, injuries and malignant diseases. Their survival is often not free of disability.

Increasing *environmental hazards* add their toll to this new pattern of disease, sometimes aggravating pre-existing ill-health, such as asthma, sometimes directly responsible for acute or chronic impairments (toxic, allergic), e.g. lead poisoning in childhood. With the epidemiological transition, some countries are simultaneously facing the burden of classical infancy and childhood diseases, which is not yet solved, and the burden of this new morbidity. They need specific flexible strategies in planning for health services and in care, delivery and the allocation of scarce resources – both human and material.

With increasing and rapid urbanization, *developmental deprivation* of young children is becoming a major issue (*Box 13*). The urban environment can be particularly hostile to children. Density of human population, accompanied by a lack of basic urban services, results in increasing environmental health risks. Poor housing, lack of parental supervision and even abandonment, early childhood labour and other consequences of urban poverty are endemic and contribute to high morbidity and mortality among children. There are limited recreational facilities. Children, particularly those in single-

parent families where the parent often has to work long and irregular hours outside the home, suffer from cultural deprivation and face a conflict of value systems, which further contributes to psychosocial difficulties. A significant proportion of urban households is headed by women who in many cases do not have any close relatives living nearby, and the nature of the areas in which they live does not foster the development of other links as alternative support.

Children are the most vulnerable members of society in times of **armed conflicts**. In the past decade around 2 million children have died as a result of war and many times that number have been displaced from their homes. In such conflicts, deaths of children are up to 24 times greater than in times of peace. At present there may be more than 4 million children in the world who have been disabled because of armed conflict, many by landmines.

The number of adult diseases that have their roots in childhood include those that have a strong nutrition-dietary component. **Deficiency diseases** need to be diagnosed and prevented in childhood. Protein-energy deficiency and specific nutritional deficiencies have been eliminated in many parts of the world but some populations are still much affected. Specific examples with long-term adverse effects are iodine deficiency disorders, vitamin A deficiency (*Box 14*), iron deficiency, fluoride deficiency, and vitamin B₁₂ deficiency.

Diseases of affluence are increasing in the industrial world and in affluent groups in developing countries. There is population-based and epidemiological evidence identifying specific dietary components that early-on increase the probability of occurrence of adult disease. In the case of some of these components, particularly in relation to cardiovas-

Box 14. The deadly deficiency of vitamin A

Vitamin A deficiency affects as many as 256 million children in more than 75 countries and is the world's most preventable cause of blindness. Of some 2.7 million preschool-age children who have eye damage resulting from this deficiency, an estimated 350 000 go blind every year, and up to 60% die within a few months of becoming blind.

Vitamin A deficiency is also linked with an increase in the severity of infections, particularly measles and diarrhoeal disease. Through synergism with measles infection, vitamin A deficiency contributes to some extent to the estimated 960 000 childhood deaths from measles every year. The effect on mortality is pronounced for diarrhoeal disease, is demonstrable for deaths attributed to measles, and very small or maybe absent for deaths attributed to respiratory disease.

This conclusion is based on a meta-analysis of 10 controlled mortality trials in populations where xerophthalmia (the eye condition caused by vitamin A deficiency) is present. The review by the same authors of 17 studies providing information about morbidity outcomes, including morbidity results from the 10 mortality trials, finds very little evidence to suggest that vitamin A status affects the prevalence of general morbidity in young children.

Deficiency occurs where diets contain insufficient vitamin A for the basic needs of growth and development, for physiological functions, and for periods of added stress due to illness. In areas where vitamin A deficiency occurs, women of childbearing age are at high risk of its consequences because they need more of the vitamin during pregnancy and lactation.

Infants who are born depleted of vitamin A need more of this vitamin than can be supplied through their mother's milk after 4-6 months of nursing if they are to be prevented from developing deficiency.

Improvement in vitamin A status may reduce the chance of infectious diseases progressing to their severe forms. Improving the vitamin A status of deficient children and treating cases of measles with vitamin A can substantially reduce childhood morbidity and mortality.

Supplementation with vitamin A has been shown to be effective in reducing mortality by as much as 23% from these conditions in areas where deficiency is common. The results of studies in Ghana and Brazil indicate that vitamin A supplementation is associated with a decrease in the severity of infectious diseases.

Recent findings have indicated that vitamin A is a key modulator of the immune system. Thus, apart from other benefits, sufficient vitamin A stores could significantly reduce the risk of transmission of HIV from infected mothers to their babies.

cular disease, reduced consumption can lower the incidence of disease. The result of scientific research continues to support the role of diet in the development of those diseases most responsible for mortality in the

Perinatal and neonatal deaths can be reduced by using an essential set of interventions for the mother during pregnancy and delivery and for the newborn child after birth.

developed world: cardiovascular disease and cancer. Excess intakes of saturated fats, with high blood cholesterol levels, are linked to eventual adult coronary heart disease. Risk factors for cerebrovascular abnormalities include high blood pressure, to which obesity, alcohol consumption, and excess salt intake are major contributors. Obesity is also strongly related to the onset of diabetes. The dynamic relationship between modifications in children's diets and sequential changes in their health as adults is beginning to emerge.

WHO's response

WHO has participated in the achievement of outstanding improvements in child health during the past 50 years. By capitalizing on the successes described in the previous section, WHO can lead the way in giving tomorrow's children a better, healthier future.

One target for that future is that by the year 2025 there should be over 5 million fewer deaths among children under 5 than in 1995, with possible decreases of between 30% and 60% in perinatal and neonatal deaths.

In terms of interventions, the scale of future successes will depend largely on wider application of the WHO/UNICEF integrated management of childhood illness, on better detection and management of pneumonia, on improvements in nutrition, and on the continuation of immunization programmes. Most of all it will be shaped by the knowledge and experience gained in the last half-century.

Historical analysis in developed countries covering this century has shown less dramatic reduction in perinatal and neonatal mortality than in postnatal mortality, probably due to the belief that perinatal and neonatal problems are not amenable to public health interventions. Although low

birth weight has been recognized as a major public health problem, improvement has been slow since many aspects of health are involved. More tangible progress has been made in eliminating neonatal tetanus through maternal immunization and promoting breast-feeding and baby-friendly hospitals. WHO has shown that perinatal and neonatal deaths can be reduced by using an essential set of interventions for the mother during pregnancy and delivery and for the newborn child after birth.

Mortality can be reduced by a further 20-30%, and WHO can achieve this by providing guidance (standards, norms, training material) in the area of newborn health to address other issues such as management of sick newborn and care of moderately preterm/low-birth-weight infants. A milestone was the WHO/UNICEF conference on infant and young child feeding (1979), which stimulated action to promote breast-feeding. Related subsequent action included the Innocenti declaration on the protection, promotion and support of breast-feeding (1990), and the baby-friendly hospital initiative. In 1992, the World Declaration and Plan of Action for Nutrition was adopted, including nine goals for the year 2000 and nine action-oriented strategies for improving nutrition.

WHO initially promoted worldwide awareness of protein-energy malnutrition through publications, cooperation with countries in national nutrition surveys, training of personnel and research. WHO/FAO expert groups elaborated guidelines for nutritional assessment, nutritional requirements, the role of nutrition units, and national nutrition policies and strategies. Applied activities and surveillance were developed in many countries, with significant impact on local or national nutritional activities and status. Particular emphasis was on

preventing micronutrient deficiencies, especially of iodine, iron and vitamin A. Global databases were developed on each of these in the 1990s, and indicators and criteria for monitoring the deficiencies, and programmes to combat them, were defined.

By 1997, over 160 countries had received technical and/or financial support from WHO for developing and implementing their national food and nutrition policies and plans. The WHO global database on national nutrition policies and programmes provides information on the progress of countries. The WHO global database on malnutrition and child growth covers over 80% of the world's under-5 children, and the databank on breast-feeding covers 65 countries (over 60% of the world population). The baby-friendly hospital initiative is being implemented in over 170 countries and over 10 700 hospitals are now designated "baby-friendly". Over 140 countries now have national breast-feeding committees or equivalent. A multicountry study on child growth is being set up in order to develop a new international growth reference for infants and young children.

Strategies to prevent malnutrition in children in the early 21st century include supporting countries in eliminating iodine deficiency and its associated brain damage, vitamin A deficiency and its associated blindness and death, and iron deficiency anaemia with its associated mortality and morbidity; improving infant and young child feeding through promotion of breast-feeding and proper timely complementary feeding; and more effectively addressing the nutritional needs of the ever-growing emergency-affected populations.

In order to avoid unsafe injections which can result in the transmission of bloodborne diseases, WHO and UNICEF are working together to

ensure that only auto-destruct syringes are used, together with safety boxes, in mass immunization campaigns. The introduction of monitors on all vials of oral polio vaccine supplied through UNICEF will be extended to include vaccine procured directly from international manufacturers. When the discard point is reached, the end user knows that he should discard the vial. This indicator and the revised policy on the use of open liquid vaccine multidose vials in subsequent immunization sessions will help reduce vaccine wastage. It will also help use the vaccine to the full extent of its true stability even in difficult access areas where the cold chain is not reliable, thus reaching children who otherwise would not have benefited from immunization services. More research is needed to develop completely safe needle-free injection technologies. New jet injectors and the administration of vaccines as solids are two of the directions that are currently being investigated and which will need additional funding in the coming years.

Older children and adolescents

During the past 50 years, the health of most children and young people between the ages of 5 and 19 has improved, at least in some ways. Their standard of living is generally higher, they are at risk of fewer infectious diseases, and they are better educated.

They are the children and adolescents who have survived the first five dangerous years of life and are not yet directly challenged by the health problems of adulthood. Of all the age groups, theirs is the healthiest, and it is one during which the foundations can be laid for a long and healthy life.

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Table 6. Health problems and health-related behaviours common among adolescents, developing countries

| Conditions / behaviour | | | | |
|---|--|--|---|--|
| Specific to adolescents | Affecting adolescents disproportionately | Manifested in adolescence, originating in childhood | With major implications for future health | Affecting adolescents less than children but more than adults |
| <ul style="list-style-type: none"> Disorders of secondary sexual development Difficulties with psychosocial development Suboptimal adolescent growth spurt | <ul style="list-style-type: none"> Maternal mortality and morbidity STD (including HIV) Tuberculosis Schistosomiasis Intestinal helminths Mental disorders | <ul style="list-style-type: none"> Chagas disease Rheumatic heart disease Polio | <ul style="list-style-type: none"> STD (including HIV) Leprosy Dental disease | <ul style="list-style-type: none"> Malnutrition Malaria Gastroenteritis Acute respiratory infections |
| | <ul style="list-style-type: none"> Alcohol abuse Other substance abuse Injuries | | <ul style="list-style-type: none"> Tobacco use Poor diet Lack of exercise Unsafe sexual practices | |

Healthy children who become healthy adolescents are more likely to become healthy adults.

As children grow and become adolescents they demonstrate growing autonomy, and their decisions, behaviours and relationships increasingly determine their health and development. Yet while their self-reliance increases with age, older children and adolescents lack the status and resources of adults. This limits the range of health-related options open to them. An important feature that distinguishes them from adults is the initiation of risk behaviour. Adolescence is a time of experimentation. The transition from early childhood to maturity involves many hazards, some of which are increasing, and others that are new.

Some health problems, conditions and behaviours are more prevalent among older children and adolescents than other age groups, and may influence their future health (Table 6).

Varying in prevalence from one country to another, these include maternity; sexually transmitted diseases, including HIV; other infectious diseases such as tuberculosis, schistosomiasis and helminth infection; mental health; substance abuse; injuries and suicide attempts.

Many of these are issues in developed and developing countries alike, and thus risk affecting all the adults of tomorrow. For these reasons, the health of this age group deserves more attention than it has received in the past. For while relatively few are likely to die at this age, many more may begin high-risk behaviours that continue into adulthood and ultimately increase their risk of premature death. The most obvious of these is tobacco use. Worldwide, most smokers begin before they are 19. It is also at about this time that other hazardous patterns may be established, such as poor nutrition, and alcohol and drug abuse. However, the

5-19-year period is also a time when health-related knowledge, skills, attitudes and values can be acquired. It is a long and unique period of continuous opportunity for public health intervention.

The 5-19 age group represented almost 30% of the total world population of 5.8 billion in 1997. By 2025, that proportion is projected to become one-quarter of a total population of 8 billion. Many of these youngsters – 25% – will be in Africa. It is expected that around 20% of the total population of the Americas, Asia and Europe will be aged 5-19 in 2020.

Only limited data exist on the **causes of death** for the age group 5-19 by region or for individual countries. The age groups tabulated are 5-14 and 15-24. For every country with reliable data, the death rate for young persons aged 5-19 is the lowest of any age group. While the risk of death is low, the available data show that in most countries, many of the leading causes of death are preventable, especially deaths related to intentional and unintentional injury. The leading cause of death for 5-14-year-olds varies by country and gender.

Age at first marriage is one of the most important factors influencing **adolescent fertility**. Populations with later age at first marriage tend to be more urban, have higher levels of education for women, and use family planning more than populations with younger age at first marriage. The percentage of women marrying before age 20 is declining in most countries in the world. However, early age at first marriage is still common in sub-Saharan Africa, where over 40% of women aged 15-19 have been married in many of the countries. The proportion of births to adolescent women that are unplanned is over one-third in 11 of 20 countries with reported data in sub-Saharan Africa and in 7 of 10 countries with reported

data in Latin America and the Caribbean. The range is 9-48% in Asia and 20-52% in Latin America and the Caribbean; and the proportion is very high in the United States (73%).

Adolescents aged 15-19 gave birth to 17 million babies in 1997, and 16 million of these births occurred in developing countries in Asia, Africa, and Latin America and the Caribbean. In sub-Saharan Africa, Latin America and the Caribbean, only modest declines are being reported in age at first birth. All countries in Asia report a decline. More than 30% of women aged 20-24 in Latin America and the Caribbean and 50-60% of women aged 20-24 in most of sub-Saharan Africa have their first birth before age 20. Adolescent fertility increases risks for both the mother and the child. For the adolescent, pregnancy is associated with increased risk of numerous pregnancy-related complications and higher maternal mortality. Adolescent mothers tend to discontinue their education and thus reduce their employment options. Their children are more likely to have a low birth weight, to be premature, injured at birth, or stillborn. The mortality rates of infants born to adolescent mothers are higher than for those of women who give birth at older ages. If projections hold however, by 2025 the adolescent fertility rate will have declined by about 40% in Africa, and 16% in Latin America and the Caribbean, although Africa will continue to have the largest adolescent fertility rate of any region (76 per 1000 women). The rate is expected to increase by 20% in Europe, and 8% in North America. Among the 10 largest countries, the highest rate will be in Ethiopia (96 per 1000 women), and the lowest is expected to continue to be in China (6 per 1000 women). The number of births to women aged

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The rates of completing three years of **schooling** increased between 1987 and 1993, but some countries still have close to 50% dropping out sooner. While there are now generally higher enrolment rates for young people, some areas remain where enrolment has not yet reached 50%. Most countries have similar enrolment rates for boys and girls. Women currently aged 15-19 are at least two to three times more likely than women currently aged 40-44 to have at least seven years of education. The increase in education level was found in almost all countries in sub-Saharan Africa and in all countries in North Africa and the Eastern Mediterranean, in Latin America and the Caribbean. In the developed countries almost all women aged 15-19 had seven or more years of schooling.

Unhealthy sexuality and its consequences

Sexual debut is taking place at younger ages, despite later marriages. Sexual experience before marriage is becoming more common, as are its consequences including sexually transmitted diseases (STDs) and pregnancy. Men are more likely to have sexual experience prior to marriage than women. The age of initiation of sexual activity is less than 18 in most countries of sub-Saharan Africa and around 20 years in Asia, Latin America and the Caribbean. In the United States, it is 16 years for male students and 17 for female students.

Contraceptive use has increased in most countries over the past 20-25 years, as family planning services have become more readily available, but has decreased in some others. Trends

in contraceptive use among currently married adolescent women vary by region. Of 13 countries in sub-Saharan Africa with available data, eight reported increases in use over time, and five had decreases. Of 11 countries in Asia, contraceptive use among currently married women aged 15-19 increased over time dramatically in eight, with little change in India, Nepal, and Pakistan. Eleven out of 14 countries in Latin America and the Caribbean showed an increase in use. Sub-Saharan Africa generally had the lowest, and Latin America and the Caribbean the highest levels of use.

As regards the contraceptive methods used by adolescents, a recent study in the United States found that young female students (aged around 15) prefer to use condoms. However, as female students become older, they are gradually less likely to use condoms and more likely to use birth control pills. While overall contraceptive use does not change, use of birth control pills more than doubles and condom use declines by over 30%. At the same time, current sexual activity increases from almost one-quarter around age 15 to almost half around age 18. This appears to signify a change in priority from protection against STDs, including HIV infection, to protection against unplanned pregnancy. Few students appear to be giving high priority to reducing the risk of both unplanned pregnancy and STD infection by using more than one effective contraceptive method, specifically condoms and birth control pills.

WHO estimates that one in 20 teenagers contracts a **sexually transmitted disease** each year. These include HIV/AIDS, gonorrhoea, syphilis, chlamydial infection and herpes. Young people are less likely to seek care for STDs, especially while they are asymptomatic, and the consequences of the delay or absence of

care can have permanent health effects including sterility and death. The prevalence patterns for STDs in developing countries are up to 100 times those in developed countries for syphilis, 10-15 times higher for gonorrhoea, and 3 times higher for chlamydial infection. Incidence is also higher in developing countries. Among developing countries the rates in Africa are generally higher than those of Asia and Latin America. Human papilloma virus (HPV) can result in cervical cancer 5-30 years after the initial infection. The risk of getting HPV and cervical cancer in those who had intercourse around age 15 has been shown to be double the risk in those who do so after 20.

In 1997, 590 000 children under 15 became infected with **HIV**, bringing the total of those aged up to 15 infected to 1.1 million. One contributing factor is that 1 million children enter the sex trade every year. In most parts of the world, the majority of new infections are in young people between the ages of 15 and 24, sometimes younger. Girls appear to be especially vulnerable to infection, but Uganda has recently shown encouraging evidence that in some cities infection rates have halved among adolescent girls since 1990. Even there, however, rates remain unacceptably high, with up to 1 pregnant teenager in 10 testing HIV-positive. That rate is six times higher than in boys of the same age. These age and sex patterns are thought to be related to young women having older sexual partners, and the increased susceptibility of the immature female reproductive tract to infection. Because the median incubation period between infection with HIV and onset of AIDS is nearly 10 years, many 20-29-year-olds with AIDS may have been infected during adolescence. Surveillance of selected sexual and injecting-drug-use behaviours among adolescents can

provide critical information about their risk of acquiring HIV infection.

Substance abuse and its consequences

Adolescence and young adulthood are the periods most associated with the onset of **illicit drug use** worldwide. A European study on drug abuse in 13 cities found that by age 18 more than 20% had tried cannabis. Solvent use is reported in higher proportions among the under-15s. A study in the United States found that the period of highest risk for cannabis initiation was generally over by age 20, having peaked at 18. Cocaine initiation peaks later, between 21 and 24. Age patterns in Asia and Latin America are slightly different, although inhalant abuse is always concentrated among the youngest age group. In Thailand consumers of solvents are generally 15-19 years old. In Pakistan the age of onset of heroin use is just over 12, but cannabis is more widespread among those under 20. Research suggests that adolescents most prone to drug use are concerned with personal autonomy, are uninterested in conventional goals and receive less parental support and more support from friends. Peer use of the substance is a primary influence, and early onset of use is associated with more intense and wider use of other drugs later. A Brazilian survey of drug use in high school students found that violence in the home was the factor most frequently associated with the use of drugs. Young people who cannot see jobs or a better quality of life in their future sometimes use drugs to counteract extreme despair and frustration. The glamorization of drug use through association with pop music culture, television and film portrayals has been noted in some countries.

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Given the health consequences, there is a clear need for smoking cessation initiatives targeted towards young people.

The age of initiation to injectables is falling in certain population sub-groups, such as street children, including those in inner cities of developed countries. In Pakistan the share of those who started using heroin between 15 and 20 years of age is reported to have doubled to 24% of those surveyed. In the Czech Republic 37% of new problem users are aged between 15 and 19, as are 50% of drug addicts in Bratislava, Slovakia. In Bulgaria the age of initiation has fallen from around 18 in the mid-1970s to 15 for heroin and 12 or younger for volatile substances. This pattern also occurs in the United Kingdom, where a survey found that 50% of 16-year-olds in north-western England had tried illicit drugs, and 20% were considered current users. In the United States, the average age for cannabis initiation is around 14 years, and approximately 2% of high school students have reported that they had injected illegal drugs. Male students are more likely than female students to report this behaviour.

Excessive **alcohol drinking** is likely to lead to traffic accidents, injury-related death and disability, and over time, serious degenerative disease of the liver. At least half of those who report drinking started before the age of 15, and a large portion of these started earlier than 12. In studies of high school students in Ghana, Kenya and Zambia, prevalence of drinking was 70-80%. A study of high school students in the United States showed that during 1990-1995 the proportion who had drunk alcohol on one or more of the past 30 days, declined from 59% to 52%, while the proportion who had five or more drinks of alcohol on at least one occasion on one or more of the 30 days preceding the survey declined from 37% to 33% during the same period.

Various studies report that the majority of smokers began **smoking**

by the age of 19; in some cases the majority of smokers had adopted the habit by 12 years of age. More boys tend to smoke than girls. In North America, about 20-30% of young people smoke. Given the health consequences, there is a clear need for smoking cessation initiatives targeted towards young people.

Depression and suicide

Adolescence is not an easy time psychosocially, and adjustment indicators are important. The Health of Youth study carried out in European countries found that depression, or the percentage of those reporting that they felt depressed once a week or more, was more common in boys than in girls, and varied considerably among countries. The first symptoms of mental illness emerge before the age of 25, for half of those who will be affected by it. The effects of unipolar depression and bipolar disorder have recently emerged as important, and can lead to problems in social interaction and to suicide in extreme cases.

Deaths from suicide are underreported because of a tendency to group them as accidental deaths or deaths from undetermined causes. Currently information is collected on suicides and parasuicidal acts (deliberate acts with non-fatal outcomes that attempt to cause or actually cause self-harm). In 10 community survey studies on adolescents published since 1986, the yearly prevalence of parasuicidal acts varied between over 2% and 20%. The differences in rates are due to different definitions and measurement issues. The prevalence of parasuicide is estimated to be 10-20 times higher than that of completed suicides. Three times more women than men attempt suicide, while three times more men than women succeed.

Injuries

Mortality rates due to injury are higher for men than for women. For example, adolescent men aged 15-19 in South Africa are up to 2.5 times as likely to die from violent injuries as are women in the same age group. In the same country, injuries account for 57% of all deaths among 10-19-year-olds. A similar pattern holds for many developing and developed countries. Unintentional injuries such as those resulting from sports, falls and especially traffic accidents, are important causes of death in Nigeria, Singapore and the United States, for example. Other countries have a higher number of intentional injuries that result in death (e.g. some Latin American countries). Injuries happen less at home and more in sports contexts or school after age 11. Boys tend to have higher rates of injury, and more broken bones, than girls. Women are at risk of violence from men they know, often their husband, partner, or ex-partner. In countries where reliable large-scale studies have been carried out, 20-67% of women report being assaulted by the man with whom they live.

Unhealthy nutrition and its consequences

In developing countries, commonly used measures include **stunting**, which refers to being below the fifth percentile of the WHO height-for-age distribution. Stunting was found to have a prevalence of 27-65% in nine out of 11 studies. It occurs in early childhood, when rapid growth should normally occur. Children who are already stunted when they reach adolescence tend not to improve during adolescence. Furthermore, there appears to be a tendency for smallness to be perpetuated across generations.

Thinness, or being below the fifth percentile of the WHO Body Mass Index (BMI) distribution for age, was only found to be prevalent in three studies. Its prevalence was 23-53% and in seven out of eight studies it was twice as prevalent in boys as in girls. BMI improved in girls throughout adolescence, but improved only in boys who had a low BMI at 10 years of age. This may be due to the delay of maturation caused by malnutrition, which is longer for boys than for girls.

Anaemia was identified as a very common nutritional problem in four out of six studies in which it was assessed (32-55%). While girls lose more iron through menstruation, boys may need more iron per kilogram of weight gained as they develop relatively more muscle during adolescence. It is possible that anaemia is responsible for the higher thinness rates in boys, although iron status does improve for boys as growth slows, and it deteriorates for girls, especially if they become pregnant. The consequences of iron deficiency are more serious for women, and they can include reduced levels of energy and productivity, impaired immune function, and increased maternal morbidity and mortality. Iron deficiency anaemia can be due to lack of iron in the diet, poor absorption of iron from food, or significant blood loss at delivery or because of hookworm infection. This is the most common type of anaemia. Causes of non-iron-deficient anaemia include malaria, thalassaemia, and sickle-cell disease. Iron deficiency has a lower threshold, and as a result is prevalent in 82% of 5-14-year-olds. Anaemia affects about half of the 5-14-year-olds in certain regions. The established and emerging market economies have the lowest prevalence of anaemia, followed by the Caribbean. In all other places, every third child is anaemic. Measures that can improve the situation

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Tuberculosis
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developing countries.

include vitamin A, iron, iodine and folate supplementation or fortification, delaying childbearing, and enhancing early childhood growth (6-18 months).

Eating disorders such as anorexia nervosa, bulimia and overeating are more common in the developed countries, as are inactivity and a sedentary lifestyle. In developing countries, the problems are mainly those of obtaining the right nutrients for optimal growth, while daily life tends to include more physical activity.

The extent to which young people are involved in physical activity is a growing concern in developed countries. **Obesity** is increasing, especially in the younger age group. Nutritional problems, especially overconsumption of fats or sugars, are taking their toll. The Health of Youth study found that an average of 74% of 15-year-old boys exercised to the point of being out of breath and sweating more than twice a week outside school. Only 52% of girls exercised twice a week, and between the ages of 11 and 15, girls became less active.

Diseases of concern for young people

Intestinal parasites are endemic in many developing areas. Treatment of helminth infection (trichuriasis, ascariasis) improves school performance. The prevalence of hookworm infection peaks around the age of 15. Because of the potential blood loss it causes, it can exacerbate anaemia in those whose diet contains inadequate iron.

While deaths from **malaria** tend to occur before the age of 5, the disease takes its toll on the young working population because of its recurrent nature, and contributes to absence from work and school. Cerebral malaria is becoming more and more common in adolescents, perhaps due

to decreased immunity, increased drug resistance, or the use of counterfeit drugs. Malaria is particularly destructive for young pregnant women as it exacerbates anaemia.

Schistosomiasis is the second most prevalent tropical parasitic disease after malaria. As transmission occurs through contact with water contaminated by infected snails, prevalence is highest in young people because of the contact they have with water sources: women fetching water and men swimming. In some African countries schistosomiasis is so common in young men that it is considered to be a sign of passage into adolescence. In young women, as well as causing anaemia it can result in social stigma which reduces chances of marriage. Detection is essential, since a single-dose treatment exists.

Tuberculosis has re-emerged as a major disease in young people in developing countries. If untreated, it can be fatal, and it tends to be more aggressive in this age group, leading from infection to development of the disease sooner. For example, the incidence of tuberculosis among 15-24-year-olds in the United Republic of Tanzania is 14% of the total number of new cases, and 11% of tuberculosis-related deaths occur in this age group.

Vaccine-preventable diseases

As a result of immunization programmes, about 8 out of 10 school-age children and adolescents worldwide have been immunized against six major infectious diseases of childhood. Immunization schedules for basic vaccines vary among different countries. Many boosters are recommended during the school-age period. For example, boosters for BCG have been suggested in many countries at ages 5-7 and 11-14. A tetanus booster is recommended during ado-

lescence, especially for pregnant women, and oral polio is also usually given once during school age. Recent studies on immunization in adolescents have focused on mass campaigns that target this age group, especially concerning hepatitis B.

Young people at special risk

The International Labour Organization estimates the number of **working children** aged between 5 and 14 at 120 million. The majority of these children are in developing countries (61% in Asia, 32% in Africa, 7% in Latin America). In many of these countries, children are traditionally incorporated into the work of their families as soon as they are capable, mostly on farms.

However, many millions of children are forced to seek employment outside the family. Studies indicate that in about 20% of cases, the child's income may be essential to an impoverished family's survival. The United Nations Economic Commission for Latin America and the Caribbean has reported that without the income of working adolescents aged 13-17 years, the incidence of poverty in that region would rise by 10-20%. Thus, many children can be found in hazardous industries, working long hours without rest, in conditions that are physically or mentally dangerous. They are at risk of occupational death or injury due to poor or non-existent safety standards, inattention, fatigue, poor judgement and inexperience in workplaces that have been designed for adults.

In developing countries, exposure to chemicals, especially pesticides, kills more rural children than the most common childhood diseases combined. Research shows that working children are six times more likely to be admitted to hospital than non-working children.

In the past decade an estimated 2 million children and young people have been killed in **armed conflict**, and three times that number have been seriously injured or permanently disabled. By the year 2000, at least 120 million young people could be vulnerable to the indirect effects of armed conflict. More than half of this estimate is made up by the risk in Africa and South-East Asia.

WHO's response

Regrettably, there are few data in most regions of the world on the health status of young people from the age of 5 to 19 years, on age-specific mortality and the leading causes of death, and on the underlying determinants. The available data are insufficient to assess fully the trends in this age group, but the preceding section highlights some areas that are priorities for WHO and for the response of the international community. Approaches traditionally used to prevent health problems and respond to them when they arise in adults, are not always effective in younger people.

For the past 30 years, WHO has been striving to bring adolescent health and development to the forefront in international public health. The main objective has been to expand the knowledge base for adolescent health and development, to understand the meaning, parameters and status of adolescent physical, psychological and social health, and to elucidate the specific actions that will promote the health and development of young people in all societies. The main results so far have been the dissemination of vital information, and publicizing priority needs.

In 1989, WHO was instrumental in bringing together the health and youth sectors in countries from all regions. Since then, a number of

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The full range
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for adolescent health
is not yet developed.

databases on major health issues in young people have been established, including on reproductive health. Considerable effort has been invested in expanding the knowledge base for adolescent health and development. For example, a WHO technical report resulted from a WHO/UNFPA/UNICEF study group which met in 1995 to review the evidence of key interventions used in programming for adolescent health. It described the current extent of experience in countries, and highlighted the essential factors and strategies needed to establish, implement and sustain adolescent health programmes. The report aims to provide substantive guidance and reference material useful for programme development in countries.

In parallel with this and in order to bridge the gap between advocacy and action, WHO has developed a series of methods specially adapted for use in the area of adolescent health. All are based upon the central principle of eliciting knowledge directly from young people and adults on their expressed needs and on solutions to their problems which will work.

The full range of interventions for adolescent health is not yet developed. In recent years, emphasis has been placed on supporting efforts that enable adolescents to build life skills. Counselling has been accepted as an important intervention, but the provision of health services to adolescents has received scant attention. Capacity for monitoring progress at the programme implementation level is limited. Weaknesses are difficult to document, and available information is not systematically used or valued. Frequently the measures of impact, such as reducing adolescent pregnancy or substance use, cannot be firmly established as an outcome of a single intervention. Technical resources to

support new programming initiatives in countries are insufficient.

Questions from countries abound – related to statistics and research findings needed to make the case for programme activities and seeking examples from other countries demonstrating promising approaches to inspire new ideas and confirm current directions. These demands cannot always be met because sound programme support materials and resource people are not readily available.

The increased attention to adolescent health has resulted in a burgeoning of projects in developing countries, often focused on single health issues. When resources are limited, efforts focusing on what is perceived as the single most important health problem affecting adolescents in the area, may seem to be meeting the most pressing need. However, there are good technical as well as practical reasons to deal with several related health issues in an integrated manner.

The need to modify approaches to meet the special needs of adolescents is further illustrated by problems associated with the diagnosis and treatment of tuberculosis. WHO is strongly advocating the expanded use of daily observed treatment of short-course chemotherapy regimens (DOTS), as a means to ensure that individuals diagnosed with the disease complete their treatment. Unfortunately, adolescents are generally considered to comply poorly with therapeutic regimens due to factors such as increased autonomy from family and limited resources available to them. The challenge facing individual clinicians and national tuberculosis programmes alike is to determine how best to improve compliance, and to ensure that adolescent patients do in fact take the medications that they need.

WHO has helped Member States to develop and test a range of epide-

miological and qualitative guidelines and methodologies to assess the extent and nature of psychoactive substance use, and to develop effective interventions. A consolidated epidemiological manual has been prepared so that Member States can develop standardized instruments and methodologies for data collection, analysis and dissemination.

WHO has already published a first global status report on tobacco or health and provides continuous support to Member States in strengthening national tobacco control. A first draft of the global report on alcohol and public health was prepared in 1997, and work has started on an international framework convention on tobacco control. The finalization of the international framework convention on tobacco control in the year 2000 is expected to establish effective mechanisms for the implementation of national and international tobacco control.

Health education

The key to promoting health in children of school age and adolescents is education. The best opportunities for positively influencing the health of this age group are found in the school (Box 15). A WHO Expert Committee on Comprehensive School Health Education and Promotion noted in 1995 that promoting health through schools could simultaneously reduce common health problems; increase the efficiency of the education system; and thus advance public health, education, social and economic development. As a result of the Committee's work, the WHO Global School Health Initiative made 10 recommendations, of which three are most likely to have a direct effect on health.

Firstly, the school environment must provide safe water and sanitary facilities; protect from infectious dis-

Box 15. School health guidelines

The Division of Adolescent and School Health of the United States Centers for Disease Control and Prevention, has developed three sets of guidelines that identify the most effective policies and programmes that schools can implement in order to promote healthy choices related to tobacco, nutrition, and physical activity: *Guidelines for school health programmes to prevent tobacco use and addiction* (published in 1994), *Guidelines for school health programmes to promote lifelong healthy eating*, and *Guidelines for school and community health programmes to promote physical activity* (1996). These guidelines were developed through exhaustive reviews of published research and exemplary practice, as well as collaboration with academic experts and over 50 national, federal, and voluntary organizations involved in child and adolescent health.

The guidelines include specific recommendations to help states, districts, and schools implement health promotion programmes and policies that have been found to be most effective in promoting healthy eating and physical activity patterns, and preventing tobacco use, among youth. Recommendations cover topics such as policy development, curriculum selection, instructional strategies, staff training, family and community involvement, and programme evaluation. The guidelines also cover the scientific rationale for school-based chronic disease prevention programmes, as well as how and why these programmes should be delivered within the framework of a comprehensive school health programme.

Target audiences for the guidelines include parents, classroom and physical education teachers, coaches, food service staff, substance abuse prevention staff, school administrators and board members, curriculum developers, textbook publishers, staff development specialists, staff of teacher training institutions, public health and social services professionals, and community-based sport and recreation professionals.

For further information on School Guidelines contact: DASH Inquires, Division of Adolescent and School Health, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, Mail Stop K-32, 4770 Buford Highway, NE, Atlanta, Georgia, USA, or electronic mail at www.cdc.gov/nccdphp/dash.

eases; protect from discrimination, harassment, abuse and violence; and reject the use of tobacco, alcohol and illicit drugs.

Secondly, every school must enable children and adolescents at all levels to learn vital skills. Health education should include topics such as infectious diseases, nutrition, preventive health care and reproductive health and should enable young people to protect the well-being of the families for which they will eventu-

Education is the
foundation for
the future success
of the young.

ally become responsible and the communities in which they reside. Life skills education should help them make healthy choices and adopt healthy behaviour throughout their lives.

Thirdly, every school should prevent when possible, treat when effective, and refer when necessary, common health problems. Schools should provide safe and nutritious food and micronutrients to combat hunger, prevent disease, and foster growth and development. They should establish prevention programmes to reduce the use of tobacco, alcohol and illicit drugs, and behaviour that promotes the spread of HIV infection. They should when possible identify and treat infections, and oral, vision and hearing problems and psychological problems, and refer those affected for appropriate treatment.

Education is the foundation for the future success of the young, as without basic literacy and numeracy the potential for individual development is drastically reduced. As the 5-19 population increases in developing countries over the next 20-30 years, continuing efforts will be needed to increase enrolment in education. The potential for distinction, necessary in defining a young person as autonomous, can come either through excellence in school, sports and other activities, or through unhealthy risk behaviours. Those deriving self-esteem from the positive activities are less likely to seek status through smoking, drinking and drugs.

Delaying the initiation of drinking alcohol, smoking and pregnancy at least until closer to the end of the teenage years should be encouraged through education, parental guidance, health promotion and legislation. More physical exercise and improved nutrition should also be promoted in this age group. In areas where there are high prevalences of

malnutrition, anaemia and helminth infection in children, fortification of foods with iron and micronutrients and anti-helminth treatment should be a priority.

The health of 5-19-year-olds can be protected by restricting their access to tobacco, especially cigarettes. Legislation should be passed to ban the sale of tobacco products to children, and school-based training programmes on the prevention of tobacco use should be more widely introduced. The most successful anti-smoking programmes are those which are oriented to the developmental needs of adolescents, emphasizing the physical and social consequences of smoking and preparing adolescents to resist the social pressure they face from their peers and others.

Fostering respect between young men and women is another priority, essential in shaping the lives of the young and developing strong family units. Family structure is central to their present and future health, and family communication is a determinant of healthy choices. It is particularly important to increase knowledge among adolescents about the value of condoms in giving dual protection from unplanned pregnancies and from sexually transmitted diseases, including HIV. These educational efforts must be made well before they reach the age of 15.

Adults

The expansion of the adult population is one of the most important of the demographic changes now occurring. Those aged between 20 and 64 years represent just over half of all the people in the world, and are expected to account for 58% by 2025. At the same time, the proportion of older people needing support from working-age adults is forecast to increase

from about 12% in 1995 to about 17% in 2025.

The young and old of all societies look to adults to provide and care for them. In their working years, adults produce and deliver almost all the essential goods and services that the world consumes. By working, adults earn the means to support their children and their aged relatives. The better the health of the adult population, the greater is its ability to play this vital role, and the better is the health of society as a whole.

This is particularly true of women, whose health critically affects that of their children and of future generations. Women's health receives special attention in both this section and the following section on the health of older people.

Adults aged 20-64 are the chief beneficiaries of the improvements in life expectancy that have occurred in the past 50 years. Between 1955 and 1995, death rates among them declined by 50%. Most people who have reached the age of 20 have a very good chance of surviving beyond the age of 65. In 1955, only 61% of 20-year-olds could expect to reach 65; in 1995 78% could, and by 2025, 85% will.

Leading causes of death

However, this optimistic picture should not obscure the fact that in 1997, there were about 15.4 million deaths among those aged 20-64. All of these deaths can be described as premature. Apart from the human losses to families and dependants, they also constitute a huge loss of economic productivity. The majority of them are preventable. For society's well-being, prevention must be the priority.

Most of these deaths are due to chronic noncommunicable diseases – circulatory diseases, cancers, chronic obstructive pulmonary disease, and

diabetes – for which there are well-known risk factors. The most important are tobacco smoking and unhealthy diet. Obesity is becoming one of the most important contributors to ill-health. Heavy alcohol consumption increases the risk of developing some cancers and mental disorders, injuries and cirrhosis of the liver.

Among communicable diseases, tuberculosis, HIV/AIDS, and acute lower respiratory infections are the leading killers.

All of these diseases, infectious and noninfectious, are also major causes of illness and disability. Most of the estimated 1 million yearly deaths due to external causes (such as suicide or occupational injuries) involve adults. Pregnancy-related causes kill 585 000 women a year. Huge numbers of women suffer from domestic and other forms of violence ranging from rape to genital mutilation.

Circulatory diseases

Diseases of the heart and circulation – cardiovascular and cerebrovascular – are for most adults the biggest risks to life. They account for at least 15 million deaths, or around 30% of the annual total, every year. Many who die of circulatory diseases are under the age of 65. Many millions more are disabled by them.

Circulatory diseases are responsible for more than 5 out of 12 million deaths in developed countries, and are rapidly emerging as a major public health concern in most developing countries. They already account for 10 million out of 40 million deaths in the developing world. The most important circulatory diseases are high blood pressure (hypertension), coronary heart disease and cerebrovascular disease. Worldwide, there are more deaths from coronary heart disease (7.2 million) than stroke (4.6 million).

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Box 16. Stroke - Destiny or challenge?

Over the past 35-40 years a decline in stroke mortality has been observed in 25 countries, most substantially in Japan, North America, and western Europe, with an acceleration in this decline in the mid-1970s. In contrast, stroke mortality has increased in eastern European countries. There is evidence that stroke is increasing in many developing countries, especially in those where hypertension has become a major public health problem.

Although the reasons for the recent decline in stroke mortality are not fully understood, there is some evidence that both improvements in case-fatality rates (survival after stroke) and in attack rates (the occurrence of the event itself) have caused the improvements in stroke mortality. The limited available evidence suggests that a decline in case-fatality may be related to decreased severity of the disease, with the acute event becoming more mild. Improved management in the acute phase may also have contributed. Declining stroke rates have been attributed in part to improved hypertension control, and increasing stroke incidence has conversely been considered a likely effect of deteriorating lifestyle factors in the population.

The widespread belief that the total burden of stroke is diminishing is mistaken however, because the total number of persons in the older population is increasing as is the proportion of people surviving an acute stroke with disabilities. Stroke will present a formidable humanitarian and economic problem if effective prevention and control measures are not implemented.

Control of hypertension and smoking cessation are most important for stroke prevention. Even modest blood pressure reduction in hypertensive people could reduce stroke events worldwide by half. Further efforts to improve hypertension control are warranted in almost all populations. This requires both more effective drug treatment and non-pharmacological measures to prevent and control high blood pressure.

In many industrialized countries **coronary heart disease** death rates peaked in the 1960s and early 1970s and have since declined dramatically. In Australia, New Zealand and the United States, for example, deaths from coronary heart disease have fallen by more than 50% since the mid-1960s. But this condition is now becoming more frequent in developing countries as their populations age and adopt unhealthy habits and behaviours. The major risk factors are high blood pressure, cigarette smoking, unhealthy diet, lack of physical activity and diabetes.

Cigarette smoking is the most readily preventable risk factor. It

causes 17% of all cardiovascular deaths, mostly in people over 65, and accounts for 23% of all cardiovascular morbidity in people under 45. Another important risk factor, high blood cholesterol levels, can be reduced by modifying the diet or by medicaments.

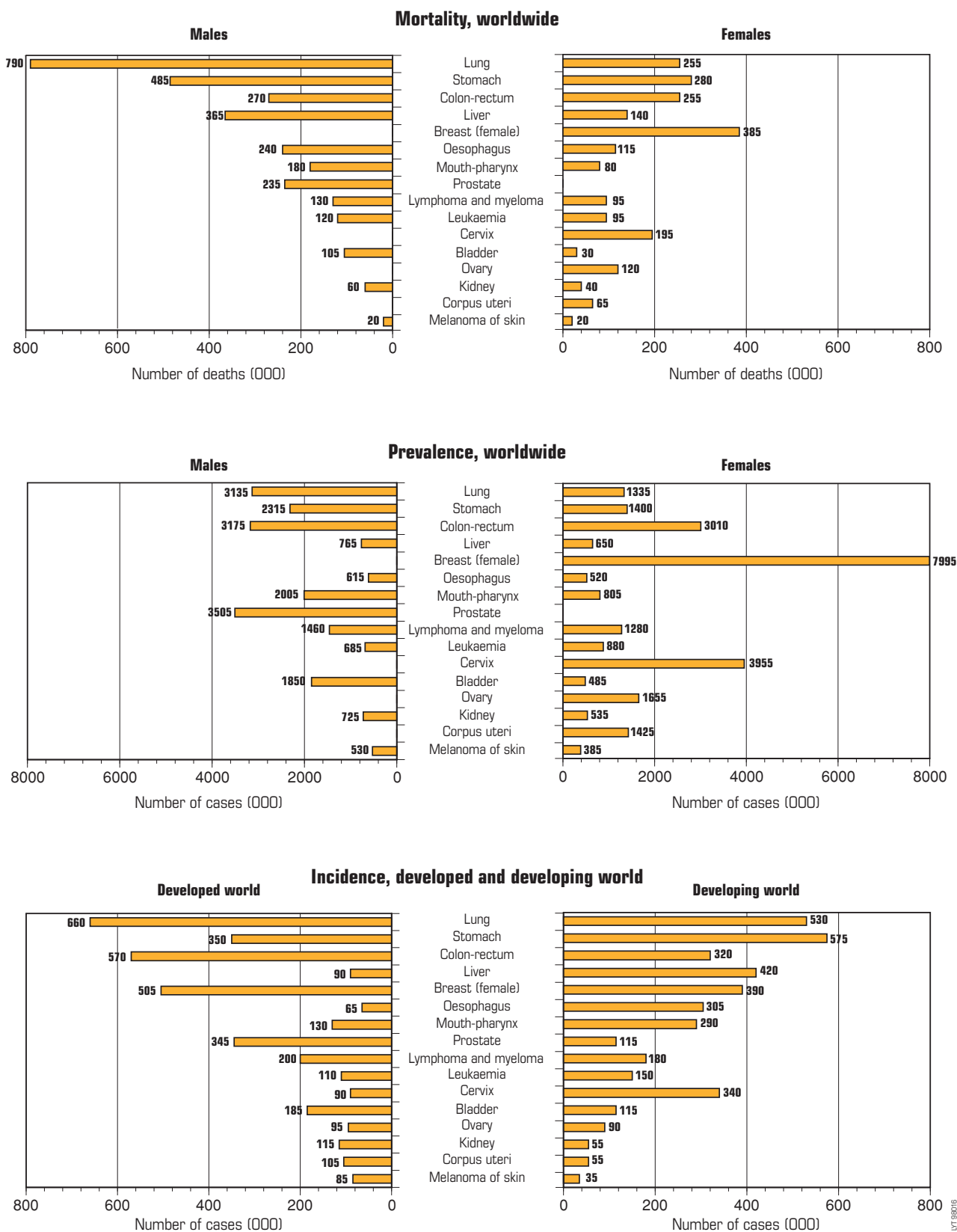
Among circulatory diseases, stroke and other **cerebrovascular diseases** are the second most common cause of death, accounting for more than 4.6 million deaths worldwide. Morbidity and mortality occur mainly in the over-65 age group. High blood pressure, affecting about 20% of the adult population, both in the developed and developing world, is the most important risk factor for stroke (Box 16). Even modest blood pressure reduction in hypertensive people could prevent half of the stroke events worldwide. Other major risk factors mentioned above in the context of coronary heart disease are equally important for cerebrovascular disease, in particular smoking. Alcohol consumption also increases the risk.

Cancer

Cancer of the lung was the highest-ranking cancer in 1997, both for the total population and for the population aged 15 to 64. The most significant global trends in cancer mortality are listed below. Certain cancers are dealt with at greater length in the women's part of this section and its counterpart in the section on older people. Fig. 10 shows the burden of cancer in 1997.

Long-term trends in survival are available only for the United States and some European countries, which are experiencing an overall improvement that is more marked in males. In 1990, the prognosis for cancer at a given stage was similar in all affluent countries. A study of survival in some developing countries has shown sig-

Fig. 10. The burden of cancer, 1997



Respiratory diseases

are second only

to cancers as causes

of death and

disability in adults.

nificantly lower survival for those tumours which are curable but require expensive drugs or technology coupled with specific expertise. Examples are lymphomas, leukaemias and cancer of the testes; also, breast cancer mortality is more elevated than would be predicted from incidence. Poor prognosis indicates lack of appropriate treatment.

In men, the effect of smoking still determines the high risk of dying from **lung cancer** in developed countries. However, incidence and mortality are declining among the young generations in rich countries, with very few exceptions (such as France, Japan and Spain). Mortality is falling in men in the United States, and began to fall in the European Union in 1985. On the other hand, a continuing rise is foreseen in Asia and Latin America. In women, mortality is on the rise in almost all developed countries, with the exception of Ireland and the United Kingdom.

Mortality from **stomach cancer** has declined and it no longer ranks first among world cancer deaths.

Incidence of **breast cancer** is increasing in the intermediate or low-risk populations (Asia, eastern and southern Europe and Latin America). In high-risk countries such as those in northern and north-western Europe, Australia, New Zealand and North America, there was a real increase until the late 1980s, after which the introduction of breast screening has modified the picture.

The incidence of **colorectal cancer** increases along with economic development. In rich countries, early diagnosis and improved survival keep mortality in control. However, screening will not be widely available in many countries currently at intermediate risk (in eastern Europe and Latin America) where the incidence is on the rise. It is possible, therefore, to predict a general parallel increase

of mortality rates in the near future.

Incidence of **prostate cancer** increased dramatically in developed countries after a cheap screening test (prostate-specific antigens) became available. However, mortality is increasing rather slowly, suggesting over-diagnosis and little improvement of prognosis. In the European Union, mortality is expected to increase by some 25% between 1990 and 2010.

Incidence of **lymphoma** is increasing in all developed countries. Due to improved survival, mortality is rising more slowly.

In spite of increasing incidence of **testicular cancer**, mortality is declining, due to substantial improvement in treatment and survival.

Respiratory diseases

Respiratory diseases are second only to cancers as causes of death and disability in adults, and rank among the three principal causes of lost work-days worldwide. Chronic obstructive pulmonary disease – a grouping of chronic bronchitis and emphysema, for which cigarette smoking is the most important risk factor – kills 2.9 million adults a year. At least 15% of middle-aged smokers in developed countries have abnormal lung function.

Asthma is a major chronic airway disorder affecting 155 million people of all ages worldwide. Asthma often appears very early in childhood and if it is inadequately treated, the life-long consequences can be substantial and disabling. The major burden of asthma falls on the developing world. Increasing prevalence is associated with spreading urbanization, exposure to domestic mites, vehicle exhausts and passive smoking.

Diabetes

The rising prevalence of diabetes mellitus is closely associated in much of the developing world with industrialization and socioeconomic development. Twenty years ago, diabetes was considered an uncommon disease with an adult prevalence of 1-3% in European and North American populations, and much rarer in developing countries. The extent of its emergence worldwide has become apparent only relatively recently (*Map 7*). WHO estimates that over 143 million persons are now affected.

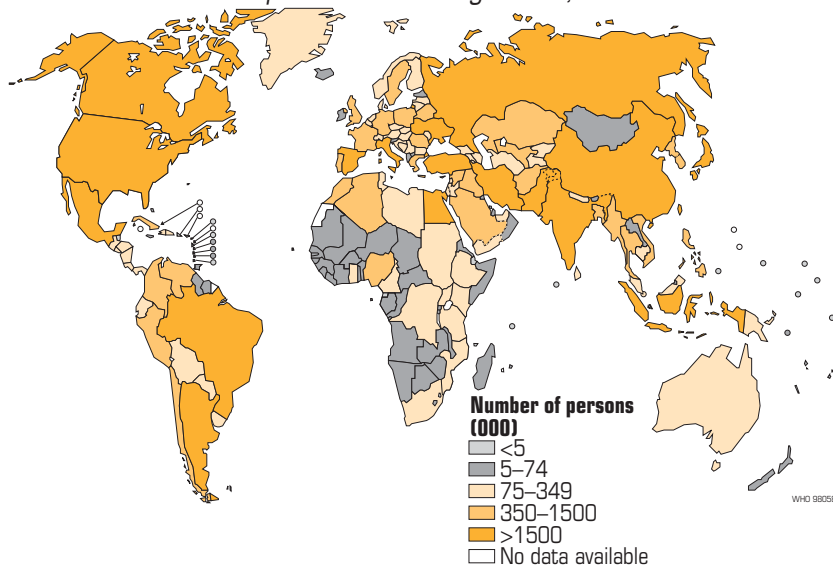
By 2025, the worldwide total is expected to rise to 300 million persons. This increase will be due mainly to population growth, ageing and urbanization. In 1997, 63% of persons with diabetes were resident in the developing countries. By 2025 this proportion will rise to 76%. In both 1997 and 2025, the three countries with the largest number of persons with diabetes are, and will be China, India, and the United States.

Whereas in developed countries, the greatest number of persons with diabetes are aged 65 years and above, in developing countries, most are aged between 45 and 64. This tendency is expected to accentuate by 2025. In the developing countries, increasingly, people will be affected by diabetes in the most productive period of their lives. Persons developing diabetes at an earlier age have longer in which to develop the long-term complications such as blindness, kidney failure and heart disease.

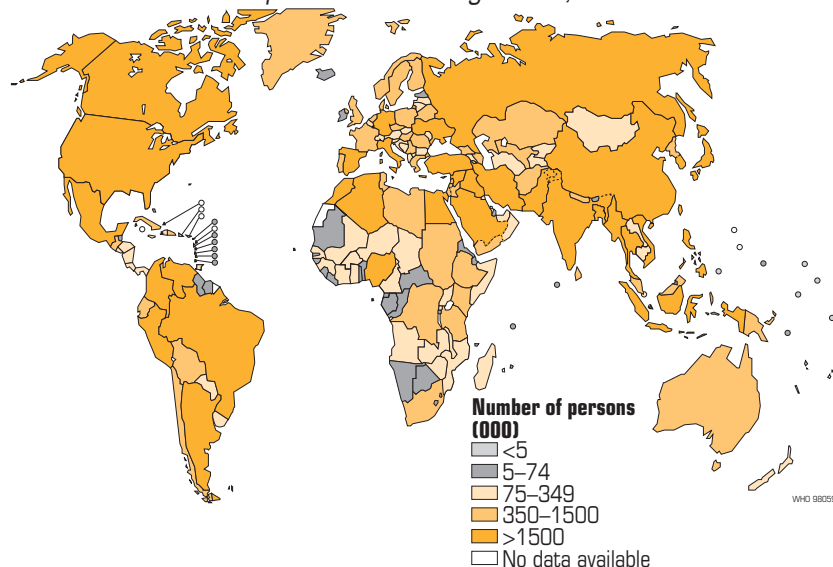
Although diabetes manifests itself most commonly in adult life, there is growing evidence that its origins lie much earlier and are related to inappropriate dietary patterns and exercise habits. Worldwide, substantial increases in the frequency of obesity are occurring, in many cases at a relatively early age. Obesity is closely related to diabetes.

Map 7. Diabetes mellitus

A. Estimated prevalence among adults, 1997



B. Estimated prevalence among adults, 2025



More working days
are lost as a result
of mental disorders
than physical
conditions.

fatal injuries

In 1990 there were almost 2 million violent deaths from homicide, suicide and acts of war: some 820 000 suicides, 560 000 homicides and 500 000 victims of war or civil conflict. In many developed and developing countries, 20-40% of deaths in men aged 15-34 are the result of homicide or suicide.

Chronic rheumatic diseases

Chronic rheumatic diseases (e.g. osteoarthritis, rheumatoid arthritis, low back pain, gout, osteoporosis and other diseases of the joints and soft tissues) are leading causes of disability. In the United States, they are among the most prevalent chronic conditions, affecting approximately 40 million persons in 1995 and a projected 60 million persons in 2020. A 1994 analysis of disability prevalence by age for Australia, Botswana, China and Mauritius showed that the frequency of disability increases roughly 3-5 times between 30-44 and 60-64.

Mental disorders

More working days are lost as a result of mental disorders than physical conditions. Identifying and treating mental disorders therefore not only reduces individual misery, it improves the functioning of the working population.

The diminishing prevalence of mental retardation is attributable to prevention of iodine deficiency in pregnancy and early childhood; to better prenatal diagnosis with tests such as amniocentesis; and to improved antenatal care and delivery practices. Screening of the newborn for the inherited metabolic disorder phenylketonuria, instituted in the 1950s, and for neonatal hypothyroidism, introduced more recently,

have also contributed to lower prevalence.

The most significant developments in mental health care in the past half-century are the more humane attitude to patients and the advent of a broad range of new pharmaceuticals affecting the brain, which have been used in the treatment of previously incurable mental disorders. The greatly diminished number of large mental hospitals is evidence of this trend, as well as the altered approach to psychiatric care.

Mental disorders contribute little to mortality but make a huge contribution to the global burden of disease. Moreover, people with depressive disorders have reduced levels of survival. The management of affective disorders, dementia, schizophrenia, post-traumatic stress, epilepsy, and alcohol and drug abuse consumes a great amount of health care resources.

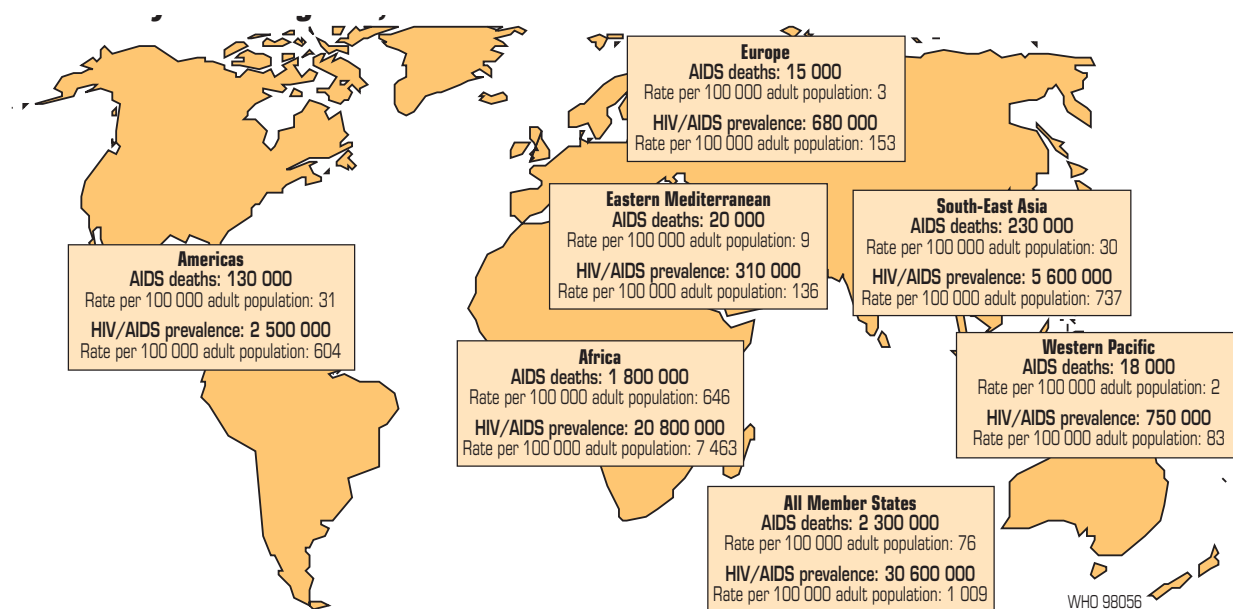
Depressive disorders appear to be more common in younger age groups, suggesting that these disorders will increase disproportionately. On the other hand, the number of persons with schizophrenia (the frequency of which remains stable over time) will rise in proportion with population growth, particularly in early adulthood, when the disease tends to manifest itself.

The high prevalence of mental illness has resulted in the increased consumption not only of prescription drugs but also of alternative medicines. Abuse of psychoactive drugs and alcohol are rising problems in many countries. WHO has promoted measures to stem the rise, including treatment and rehabilitation policies for those dependent on psychoactive substances and alcohol.

Infectious diseases

In 1997, there were over 7 million new cases of *tuberculosis*, and

Map 8. AIDS deaths and HIV/AIDS prevalence among adults aged 15-49, by WHO region, 1997 estimates



around 3 million died of it, making this disease the leading infectious killer of adults.

The disease is being controlled in many parts of the world, however. It has become clear that the DOTS strategy can achieve high cure rates in any country which is determined to succeed. The treatment success rate of cases in DOTS areas was 78%, compared with 45% in non-DOTS areas. The use of DOTS has expanded nearly tenfold in the past five years, cure rates have nearly doubled and drug-resistance is lower in places where DOTS has been used. But as impressive as this progress may seem, it is simply not enough when compared with the scale of the global epidemic.

AIDS deaths in 1997 totalled 2.3 million, of which 1.8 million were among adults aged 15 and above (*Map 8*). Assuming that currently unbroken trends in many parts of the world will continue, it is estimated that more than 40 million people will be living with HIV/AIDS in the year 2000.

Although prediction of the long-term course of the epidemic is difficult because of the potential impact of prevention efforts, it is not unreasonable to assume that the number of people living with HIV/AIDS will continue to grow well into the 21st century (*Box 17*). However, even if current increases in new infections seen in many parts of the world could be stopped or reversed, morbidity and mortality will continue to increase for another decade as a result of the long latency period between infection and the development of the disease.

Gains in survival achieved over the past few decades will, in some places, be cancelled out by the effects of HIV infection. Life expectancy in Botswana rose from under 44 years in 1955 to 58 years in 1990. Now, with 25-30% of the adult population infected with HIV, life expectancy is expected to drop back to levels last seen in the late 1960s. By the end of the decade, Zimbabwe will see a 10-year reduction in the life expectancy of a child born in 1990. Other sub-

Box 17. The evolution of AIDS

Recognized as an emerging disease only in the early 1980s, AIDS has rapidly established itself throughout the world, and is likely to endure and persist well into the 21st century and probably beyond.

AIDS has evolved from a mysterious illness to a global pandemic which has infected tens of millions in less than 20 years. It is now prevalent in virtually all parts of the world.

There are currently an estimated 30.6 million people living with HIV/AIDS, and 5.8 million new infections occurred in 1997. Since the beginning of the epidemic there have been an estimated 11.7 million deaths from AIDS, 2.3 million of them in 1997. The total number of AIDS orphans (HIV-negative children who lost their mother or parents to AIDS when they were under the age of 15) is near 8 million since the beginning of the epidemic.

The AIDS virus affects people who are particularly vulnerable. The main behavioural characteristics that facilitate the spread of HIV are unprotected sexual activity with different partners and sharing of equipment by injecting drug users. Women with HIV can also transmit it to their newborn children.

Adolescents and young adults who are becoming sexually active for the first time are particularly exposed, and are therefore an important target group for preventive action.

The AIDS virus is a virtually invisible passenger that uses the human body as a vehicle throughout a long incubation period before causing illness more than 10 years later in many cases. During part of that time HIV can be transmitted by an infected but symptomless individual to other people, who likewise will be its unwitting vehicle for further years and ensure its wider spread. In addition, the virus can mutate within an individual's body, so that by the time it is transmitted to someone else, it has changed some of its characteristics. This lack of "stability" is part of the complex make-up of HIV which will make the development of new drugs - and possibly a vaccine - very difficult.

From being first regarded as a "minority group" disease, AIDS has gradually been shown to be essentially a heterosexually transmitted infection. However, the evidence that transmission is most likely to occur with unsafe sexual behaviour has engendered complacency among populations which consider themselves outside that danger zone - either socially, behaviourally or geographically. This misperception or denial of risk is often a factor for further spread of the virus.

In some industrialized countries, AIDS is regarded as a disease restricted to the developing world. Such complacency is one more reason why AIDS will persist for a very long time. For the history of disease shows that when complacency occurs and vigilance weakens, infectious agents take full advantage of the situation.

The prospects for HIV/AIDS control depend largely on recognizing the scale of the threat and on political commitment to implementing policies to counter it. A key aspect of national AIDS programmes is early intervention addressing sex education, condom promotion and STD care; creating an enabling environment to facilitate behavioural change; and providing the necessary means to do so. Research is resulting in better understanding and treatment of HIV/AIDS. Combined drug therapy has lengthened life for many patients, but is inequitably distributed.

Saharan African countries show similar trends.

The potential for continued spread of HIV/AIDS in Asia and the Western Pacific is real and requires determined and sustained prevention efforts. Several countries have already experienced intense epidemics in certain population groups, or in some cases, in the population at large. In these countries, including Cambodia, India, Myanmar and Thailand, AIDS has imposed new demands on health care systems.

Drug injection is behind the dramatic surge in HIV infection in several eastern European countries, accounting for the majority of the 100 000 new infections estimated to have occurred in 1997. In Ukraine, where around 70% of infections have been in drug users over the past three years, some 25 000 cases of HIV infection have been reported so far, half of them in 1997. It is possible that a similar pattern will be seen elsewhere in the region.

In Latin America and the Caribbean, AIDS has already overtaken traffic injuries as a cause of death. However, a recent drop in AIDS mortality - similar to that seen in western Europe and North America - has been recorded in Sao Paulo, Brazil, and is attributed to the increasing use of antiretroviral therapy. In the United States in 1996, AIDS dropped into second place among leading causes of death in people aged 25-44 for the first time since 1992 (injury took over in first place). In western Europe also, the annual incidence of new cases of AIDS has begun to decline.

Unfortunately, access to anti-retrovirals in the developing world is often difficult or impossible. It is encouraging, however, that in some developing countries such as Thailand and Uganda, the effects of preventive interventions are beginning to be seen. As a result of the increase in

condom use and declines in other sexually transmitted diseases, the number of people expected to become HIV-positive in Thailand is now less than previously projected. Population growth is now expected to remain positive, whereas in 1994, population projections for Thailand indicated negative population growth by 2010. It appears likely, nevertheless, that many if not most of the 30 million people currently infected may well die – perhaps within the next decade.

Each year, there are 300-500 million clinical cases of *malaria* and 1.5-2.7 million people die of the disease. Of these deaths, 90% occur in sub-Saharan Africa, mainly in children under 5. The adult victims of malaria are those who were not previously exposed and thus have no immunity. Young men and women bear only 5-7% of the malaria burden. For many it is virtually an occupational disease because of their work in land development, mining, construction and seasonal migratory agriculture in malarious regions.

Apart from being a disabling and sometimes fatal disease in itself, malaria in non-immune pregnant women, or previously immune women in their first pregnancy, causes spontaneous abortion in up to 60% of cases and a maternal mortality rate of up to 10%. Malaria in adults also has a serious economic impact in terms of both lost productivity and treatment costs. Direct losses due to the disease in Africa in 1989 were calculated to be \$ 800 million; by 1997 the figure had risen to \$ 2.2 billion. This is largely due to the rising costs of treatment resulting from antimalarial drug resistance. Treatment costs for a normal bout of malaria can be as low as \$ 0.15; to treat resistant strains can cost \$ 7 per patient. In the malaria-endemic countries of South America, an episode of the disease

causes the loss of between 1 and 14 days of work. Increasing numbers of cases are reported among international tourists and business travellers, of whom some 30 million from non-endemic countries visit malaria-endemic countries each year.

Resistance to the antimalarial chloroquine was reported on the Thai-Cambodia border and in Colombia in 1961, and spread in the late 1970s to Africa, where it has been reported from practically all endemic African countries. Chloroquine is still clinically effective in most primary health care settings, but its loss of efficacy in some areas has been accompanied by an increase in malaria morbidity and mortality.

Occupational diseases and injuries

WHO estimates that every year there are 217 million cases of occupational disease and 250 million cases of injuries at work, including 330 000 fatal cases. There are about 50 million new cases per year of occupational respiratory diseases. The 10 major work-related illnesses are respiratory diseases, musculoskeletal disorders, cancer, injuries, cardiovascular diseases, reproductive disorders, neurotoxic disorders, noise-induced hearing loss, dermatological disorders and psychological disorders.

Without preventive action, the burden of occupational diseases and injuries will escalate. By the year 2000, the global labour force will grow to some 3 billion people. Participation of women in the workforce will increase. Many workers will be exposed to occupational hazards such as toxic chemicals and dusts, allergenic agents and carcinogenic agents, and to serious injuries causing more than one month's absence from work.

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Box 18. Spotlight on gender

WHO, in applying a gender approach to health, moves beyond describing women and women's health in isolation, bringing into the analysis differences between women and men. It examines how these differences determine differential exposure to risk, access to the benefits of technology and health care, rights and responsibilities, and the control of people over their lives. In practice, a gender approach leads to:

- More consideration of all the factors that affect women's health, not only biological factors but social and economic status, cultural, environmental, familial, occupational and political factors.
- More attention to all of women's roles, not only their roles as wives and mothers.
- More attention to the roles and responsibilities of men, and the inequalities between men and women, with an examination of men's roles, perspectives and beliefs in relation to women's health concerns.
- More involvement of men in bringing about change.
- Listening to what women have to say about health and what they would like to know about it, rather than simply transferring information to women.
- Stronger measures to ensure that the voices of women are heard in identifying health issues and in research, planning, carrying out and monitoring the response to them.
- More attention to the entire duration of a woman's life, from birth to death - health for everyone is a cumulative matter.
- Greater recognition and support of women as active participants in the development of health care for themselves, their families and communities.

Most of these conditions lead to a reduction in working capacity or a permanent disability. The rising costs of occupational illness and injuries make health promotion and safety in the workplace a sound investment. In 1993, the cost of workers' compensation in the United States alone amounted to \$ 57 billion. Data from 14 countries in Latin America and the Caribbean show that 38 million workdays were lost through occupational injuries each year during the 1980s. If this figure is extended to the population of the entire subregion, it can be assumed that approximately 95 million workdays are lost each year.

Special concerns of women

The United Nations Decade for Women (1976-1985) raised awareness of the link between women's status, fertility, and development. Societal policies can reduce gender inequalities (Box 18). Because of the strong preference for male children in many parts of the world, women receive inferior nutrition and health care from birth. Persisting discrimination will impede the improvement of women's health. Policies that aim to reduce gender inequalities focus on educating and empowering women and on encouraging both sexes to challenge gender stereotypes.

Coronary heart disease and stroke account for close to 60% of all adult female deaths in a typical developed country and are also the major cause of death among women aged 50 years and above in developing countries. A WHO study published in 1996 on the risk of haemorrhagic stroke associated with the use of oral contraceptive pills showed that the pill does not increase the risk in women below 35, who form the great majority of pill users worldwide. In current users over 35, however, the study found a small increase in risk. This was also found in relation to ischaemic stroke in current pill users, but was lower in women under 35, in non-smokers and in those who did not have high blood pressure. For both types of stroke, the study found no increased risk in women who had used the pill in the past. Women's risk of stroke can be reduced by avoiding using the pill if they have high blood pressure, and for users of the pill, by avoiding smoking.

Worldwide there are almost 700 000 cases of **breast cancer** each year, 57% of which occur in developed countries. Early detection is the main strategy for prevention, through physical examination of the breasts by

trained health workers, breast self-examination, and mammography. Trials have shown that through screening – mammography followed by effective treatment – breast cancer mortality can be reduced by 30% in women aged 50 years and above. There is as yet no clear evidence of benefit from screening programmes for premenopausal women. The organization and implementation of mass screening programmes are far beyond the resources of developing countries, and breast self-examination remains the main option.

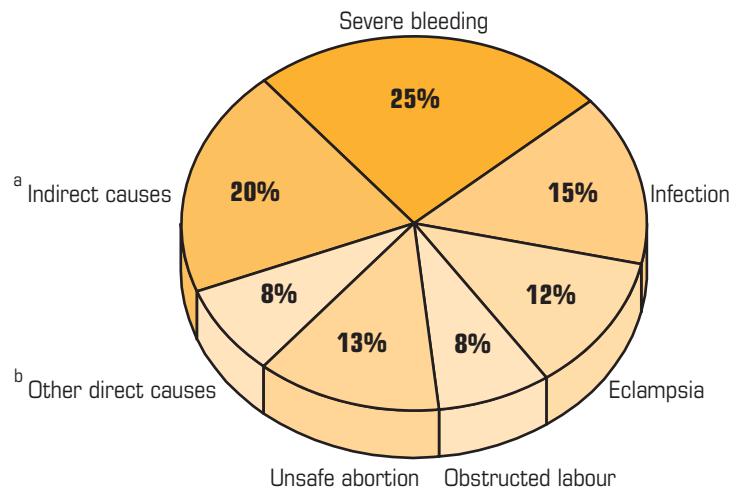
Cervical cancer is a preventable major cause of death, with 425 000 new cases are diagnosed each year, mostly in developing countries. The disease is one of the few cancers with a readily detectable and treatable precursor stage. In developing countries, screening is rarely accessible to women in rural areas, or to ageing women, who are at greatest risk. Screening once every five years and appropriate treatment can result in a reduction of 85% in mortality; screening once every 10 years could result in a 64% reduction. Screening older women, even once in their lifetime, will prevent more cases of cervical cancer than screening a small proportion of younger women every few years.

Around 585 000 women die each year of **pregnancy-related causes**, 99% of them in developing countries. These are among the leading causes of death for women of reproductive age in many parts of the world. Where women have many pregnancies, the risk of related death over the course of a lifetime is compounded. In Africa, the risk is around 1 in 16, compared with 1 in 65 in Asia and 1 in 1400 in Europe. About 80% of maternal deaths are due to direct causes, that is, obstetric complications of pregnancy, labour and the puerperium, to interventions, omissions, in-

correct treatment, or to a chain of events resulting from any one of the above (Fig. 11). The single most common cause – accounting for a quarter of all maternal deaths – is obstetric haemorrhage, generally occurring postpartum, which can lead to death very rapidly in the absence of prompt life-saving care, including drug treatment to control bleeding and, where needed, blood transfusions.

Puerperal infections, often the consequence of poor hygiene during delivery, or untreated reproductive

Fig. 11. Causes of maternal deaths, latest available year



^a Indirect causes including, for example: anaemia, malaria, heart disease.

^b Other direct causes including, for example: ectopic pregnancy, embolism, anaesthesia-related.

tract infections (including those that are sexually transmitted) account for some 15% of maternal mortality. Such infections can be easily prevented. Hypertensive disorders of pregnancy, particularly eclampsia (convulsions), result in some 13% of all maternal deaths; they can be prevented through careful monitoring during pregnancy and treatment with relatively simple anticonvulsant drugs in cases of eclampsia. Around 7% of maternal deaths occur as a result of prolonged or obstructed labour. Other direct causes include ectopic

Box 19. Family planning

In the 1960s there was growing concern among countries about the negative impact of uncontrolled population growth on economic and social development, especially in developing countries. Human reproduction and especially contraception and family planning, previously taboo subjects at the World Health Assembly, were now openly discussed. In 1965, the Health Assembly adopted a resolution directing WHO to conduct research on medical aspects of sterility and fertility control methods and health aspects of population dynamics. A unit for this purpose was set up in mid-1965 at WHO headquarters. It subsequently became the Special Programme on Research, Development and Research Training in Human Reproduction.

Meanwhile, other organizations within the United Nations system and among the large foundations had become increasingly active in the area of population and family planning. Important new organizations were created during this period, such as the International Planned Parenthood Federation (1952), the Population Council (1952), and the Population Trust Fund – UN (now the United Nations Population Fund).

Three large intergovernmental conferences on population held in Bucharest (1974), Mexico City (1984) and Cairo (1994) brought together representatives of governments, specialized agencies, organizations of the United Nations system, intergovernmental organizations, nongovernmental organizations and the media to discuss issues of population and development and formulate plans of action. All these meetings endorsed population and family planning as integral to overall development. They established linkages with parallel concerns being discussed in other forums, such as health, the environment, children, women and human rights.

Population policies to provide the policy and legislative framework for the provision of family planning are essential. The successive population conferences and other important meetings have encouraged the development and adoption of such policies, and by 1991 (the latest dates for which figures are available) 96% of governments had policies directly supportive of the provision of family planning care, compared with 55% in 1974.

Fertility regulating methods that are safe, effective, reversible, easy to use and affordable are also essential. Research on technology development and assessment by WHO and others in collaboration with industry, government research councils and institutions throughout the developed and developing world have contributed substantially towards making such methods available.

of the most significant is anaemia, which can cause death through cardiac arrest and is also an underlying cause in a substantial proportion of deaths. Other important indirect causes of death include hepatitis, cardiovascular diseases, diseases of the endocrine or metabolic system, and diseases of the central nervous system.

The percentage of contraceptive users has increased from around 14% in 1960-1965 to an estimated 60% of women of reproductive age in 1994 (Box 19). Women are using family planning in increasing numbers in every region of the world. In developing countries, five times as many couples are now using contraception as in the 1960s. Worldwide, however, the full range of modern methods is unavailable to up to 350 million couples.

Present in most societies, but unrecognized, unreported or tacitly accepted, **violence** against women is a major health issue. Reliable information about its extent is unfortunately scant. Between 16% and 52% of women in some parts of the world suffer physical violence from their male partners. At least one in five women suffer rape or attempted rape in their lifetimes. Rape and sexual torture are systematically used as weapons of war. Psychological trauma, sexually transmitted diseases, unwanted pregnancies and reproductive health problems are among the consequences. Female genital mutilation is a traditional cultural practice, but also a form of violence against the girl child which affects her life as an adult woman. The number of girls and women who have been subjected to this practice is estimated at more than 130 million worldwide.

WHO's response

By the late 1980s and early 1990s it was clear that, with increasing

pregnancies, embolisms and deaths related to interventions such as anaesthesia.

Around 20% of maternal deaths are due to indirect causes, that is, the result of pre-existing disease or disease that developed during pregnancy, which was not due to direct obstetric causes but was aggravated by the physiological effects of pregnancy. One

co-infections with HIV and the spread of multidrug-resistant strains, the **tuberculosis** epidemic was worsening. In 1991, the World Health Assembly called for the strengthening of district-centred tuberculosis programmes and the widespread implementation of directly observed, standardized, short-course chemotherapy (DOTS) and in 1993, WHO declared a global tuberculosis emergency.

The DOTS strategy incorporates components that were discovered, developed or expanded by a number of organizations and individuals over the past 45 years. These components are being used in one integrated strategy to document and manage the cure of tuberculosis cases, thus reducing the sources of infection in the community. Although there is no doubt about the effectiveness of DOTS in curing patients, it is still a strategy waiting to be used. Sustained political commitment is a major determinant of success. Governments must recognize the long-term benefits of providing the resources and staff necessary to ensure the proper implementation of DOTS. The benefits to individuals and society as a whole are overwhelming in comparison to the investment involved. Current research and surveillance initiatives are giving WHO a clearer picture of the threat of multidrug-resistant tuberculosis, as well as providing more accurate verification of data – both of which help the world respond more effectively to the epidemic. Because breakthroughs in diagnostic tools, drugs and vaccines may be years in the making, the world's future success in eliminating tuberculosis as a public health threat will rely on the parallel strategies of aggressive expansion of DOTS and a continued commitment to research.

In the 1980s, WHO alerted world authorities to national epidemics of **HIV/AIDS**. Since 1986, the Organi-

zation has helped Member States to establish or strengthen their national AIDS programmes; to carry out rapid assessment; to improve diagnostic, laboratory and blood screening capacity; and to plan national activities and long-term responses based on reliable projections. A report on the implications of the new antiretroviral treatments was published in 1997.

The development of a cheap, safe and effective vaccine is a priority, although this is not likely to be achieved for at least 10 years. Any major initiative in this area requires that the partners play three major roles: supporting and coordinating research; negotiating with industry to ensure that the products of research will be available to those most in need; and seeking mechanisms to encourage vaccine research, which is commercially far less attractive than research on new drugs. The development of a microbicide is equally urgent as the use of such a product is a method that is simple, can be controlled by women, and could be inexpensive. This highly promising area, likely to produce the quickest and widest benefits, needs an urgent injection of funds and effort. Drug therapy, on the other hand, is far from being a practical option (on grounds of cost, compliance, efficacy and resistance) or widely applicable as yet.

The majority of **occupational diseases** can be prevented through action in the work environment, improvement of working conditions and the reduction of harmful exposures. WHO's work on occupational health dates back to 1950, when it set up a joint committee with ILO. At the beginning of the 1990s, WHO instituted a new agenda for work, development and health, which led to the development of the Global Strategy for Occupational Health for All. Member States are urged to devise national programmes, with special attention to

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full occupational health services. WHO promotes health in the workplace in a wider sense through advocating the concept of the healthy company or healthy organization.

In 1997, WHO cosponsored and participated in the international symposium on maritime health in Norway and the international symposium on occupational asthma and allergy held in the Russian Federation, as well as the international conference on occupational health in the informal sector which took place in Indonesia. A joint ILO/WHO initiative to eliminate silicosis is planned in 1998. The disease is common in labourers in mines, quarries, construction, ceramics, the metal industries and other dust-generating activities.

Special concerns of women

Many WHO programmes are now addressing women's needs, but few have begun to examine systematically differences between the needs of men and women. Sex-disaggregated data are needed for any analysis of gender differences. WHO is developing a policy on gender and health which should facilitate this work. Several of the regional offices are collecting data in order to develop national and regional profiles of women's health.

WHO's norms and standards for post-abortion care represent best international practice and form the basis for the technical support that WHO provides to Member States and other partners. To date, systematic reviews have been undertaken and recommendations issued in relation to a range of issues, covering clinical management and complications, post-abortion family planning and managerial issues.

The Global Commission on Women's Health focuses on three key areas: education for the health of girls

and women; violence against women; and maternal morbidity and mortality. Activities at the country and regional levels have focused on data collection and research in areas where gaps in knowledge about women's health exist, e.g. to examine the household factors affecting maternal morbidity and mortality.

WHO activities in reproductive health in 1997 included the expansion of the research initiative on the role of men in reproductive health; publication of data from the WHO collaborative study of cardiovascular disease and steroid hormone contraception; the completion of data collection – and initiation of final analysis – of a large post-marketing surveillance study of Norplant contraceptive implants; and the launching of several regional initiatives on female genital mutilation, acceptability of emergency contraception, increasing rate of Caesarean section and quality of antenatal care.

Older people

The challenges of ageing

For more people than ever before, the prospect of a healthy and extended old age is becoming a reality. People are not only living longer; research shows that in some cases they are also living in better health, with their rates of disability going down at the same time as their life expectancy goes up. For example, the National Long Term Care Surveys in the United States show significant declines in disability prevalence among older people between 1982 and 1994 (Box 20, Fig. 12). On this evidence, the world is learning how to grow old successfully.

The progressive ageing of populations in the 20th century is a triumph for the human species. Glo-

bal population ageing reflects the unprecedented gains in life expectancy described earlier in this report. It is due to a combination of factors, especially the dramatic declines in infant and child mortality, reductions in maternal deaths, and the benefits that come from overall socioeconomic development – improved nutrition, declining infections, better standards of living, progress in education, health care, and biomedical technology.

This ageing trend offers both great opportunities and formidable challenges for all societies. But for many, those opportunities may be denied and those challenges may become unmanageable in the coming century. It is essential that the potential social and economic impacts of improved life expectancy are fully appreciated and acted upon today. The well-being of society depends on the good health of its older members in their later years. For policy-makers and individuals alike, this means planning for the future.

The global challenge

Half a century ago, most people in the world died before the age of 50. Today, the great majority survive well beyond that age, particularly in many industrialized countries. The global population aged over 65 years is increasing by 750 000 a month. A child born in Japan today can expect to live to be 80 years old. By 2025 there will be more than 800 million older people in the world, two-thirds of them in developing countries, and a majority of them will be women.

Increases in the older population by up to 300% are expected in many developing countries, especially in Latin America and Asia, within the next 30 years. There will be 274 million people over the age of 60 years in China alone – more than the total present population of the United States.

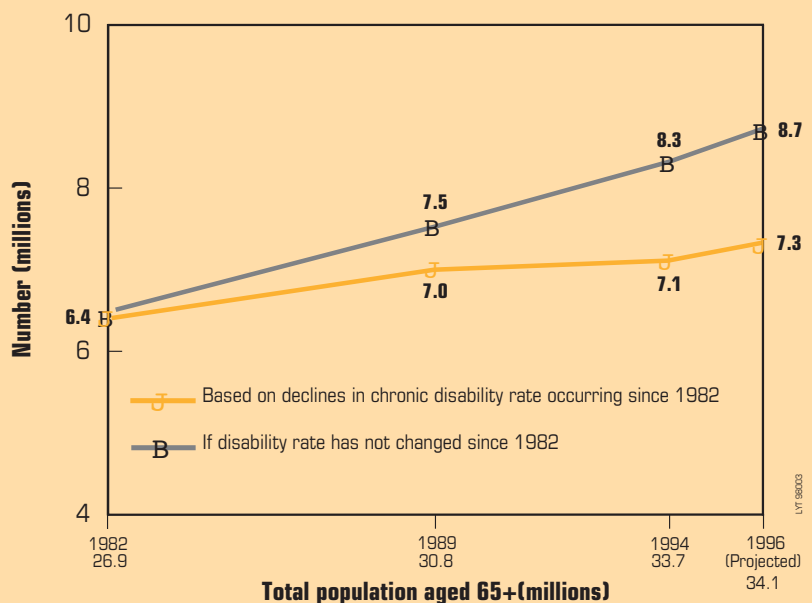
Box 20. Living longer, feeling better

Biomedical research has had great positive effects on the health and physical functioning of the human population; by stimulating the growth of biotechnology, it has greatly affected the economies of developed nations. These effects on the health of the aged in the United States can be demonstrated using data from the National Long Term Care Surveys (NLTCs). Manton and his colleagues at Duke University found that the prevalence rate of chronic disability and institutionalization declined significantly, by almost 15% for the aged United States population from 1982 to 1994 (age 65 and older). This confirmed the decline in chronic disability prevalence of about 8% observed from 1982 to 1989 and suggested that the rate of decline in the prevalence of disability among aged Americans had actually increased (to 1.5% per annum) between 1989 and 1994.

Not only did the prevalence of, and institutionalization rates for, disability decline, but the prevalence of many chronic degenerative diseases measured by the NLTCs, and those thought to generate chronic disability, showed significant reductions. The declines in chronic morbidity suggest that chronic disability prevalence rates will continue to fall, at least over the period between the time of chronic disease onset and its eventual progression to a stage generating serious chronic disability. Longer-term declines are implied by lower disability prevalence rates, and higher survival rates at age 65-69 across three elderly cohorts from NLTCs sample populations in 1982 and followed to 1991.

Personal communication from Kenneth G. Manton, Larry S. Corder & Eric Stallard, Center for Demographic Studies, Duke University, Durham, NC, USA.

Fig. 12. Chronically disabled Americans aged 65 and above



Source : National Long Term Care Surveys 1982-1994.

Population ageing

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It is a quiet,

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social revolution.

At present, 13% of the population of the United States is aged 65 and above, compared to 4% at the beginning of the 20th century. The proportion is expected to reach approximately 20% by 2030. Although the population is ageing more slowly in industrialized countries, these countries will have relatively more people in the “oldest old” bracket. For example, there were only 200 people aged 100 years in France in 1950. By the year 2000, the number is expected to rise to 8500, and by 2050 it is projected to reach 150 000 – a 750-fold increase in 100 years.

The global challenge of ageing is made more complex by other demographic changes that are occurring simultaneously. In the next 25 years, the population aged 65 and above is likely to grow by 88% compared to an increase of 45% in the working-age population. This implies that a steadily declining number of people of productive age will have to provide for an expanding number of dependants, not merely in the form of direct support to older relatives but also through taxation, the provision of health and social services, and social security.

The social challenge

The adults of today are the older people of tomorrow. They are already asking: What kind of old age will we have? How will it differ from that of our parents and grandparents? What will be our quality of life? What will be our place in society? The answers largely depend on what people do now as individuals to ensure healthy ageing, and what governments and communities are prepared to do on their behalf.

Maintaining health and quality of life in an ageing population will be vitally important socially and economically. In the 21st century, post-

poning the adverse effects of old age for as long as possible will be a major political and personal preoccupation. Health-related policies are needed to tackle the problems faced by those already in old age and those who will be the older people of the future.

Population ageing is having profound effects on society. It is a quiet, almost unseen social revolution that is gradually gaining pace and will accelerate and become ever more evident in the next 25 years. Its influence will be felt at every level, from family life and living arrangements, employment, the provision of health services and pension systems, to the state of the economy (*Box 21*).

In some of the more advanced nations, the day is not far off when older people will outnumber children, and the number of people reaching their hundredth year will be counted in tens of thousands.

While society is ageing, it is also changing in other, related ways. Traditionally, families have looked after their older members. Today's old tend to have fewer children to care for them, and in many cases those children have grown up and moved away to live at great distances from their parents.

Although daughters and sons are still the primary caregivers, their ability to care for their older relatives has been altered by changes in lifestyles. Women, the traditional caregivers, have increasingly become part of the workforce, and so unavailable for their customary role. To fill these gaps, the community is increasingly expected to intervene, by providing social services, home visits, hospitals, nursing homes, and sheltered accommodation for its older dependants, and to favour community care rather than institutionalized care.

Already, population ageing is beginning to revolutionize health care

and social systems, with new public policies on health and social care – public and private sector pluralism, reduction in public spending – being widely adopted throughout the world. To many observers, these trends seem likely to exacerbate the disadvantaged position of many older people.

Even in wealthy countries, most old and frail people cannot personally meet more than a small fraction of the costs of the health care they need. At present, it seems clear that neither developed nor developing countries will be able to provide long-term, specialized care for the vast numbers of aged individuals in the population in the coming decades. But this scenario is not inevitable. Caring for the aged could be a great source of new employment.

Most of the increase in older populations will occur in developing countries, which will face the most serious challenges in providing a “welfare package” of services for their older people, given their economic difficulties, the lack of social service infrastructures, and the decline of traditional caring provided by family members.

Growing older is associated with increasing disability and greater dependence on others. Generally a person is regarded as dependent if he or she needs the help of another person in order to perform the basic activities of daily living, such as washing, getting dressed, moving about, eating and drinking. Most older people will eventually need help of this kind to some extent. It may be provided by any combination of relatives, neighbours, the community and health and social services, and it may be needed for periods of many years.

The cost of such help can seldom be borne entirely by the older individual or the family. The question therefore arises of who bears the cost,

Box 21. Disablement and functioning - Towards a common language: ICDH-2

In line with its broad understanding of health, WHO is involved in a global initiative to revise the *International Classification of Impairments, Disabilities and Handicaps* (ICIDH) to capture an important paradigm shift towards a biopsychosocial understanding of human functioning and disablement. The revised version (ICIDH-2) is a classification of human functioning at the body, person and societal levels that takes into account the social and environmental context in which people live.

Medical diagnosis alone does not predict health care needs of individuals, nor does it predict the utilization, outcomes or costs of health services. Moreover, the presence of a medical condition is not a reliable guide for work performance, disability benefits or social integration of the individual.

With the increasing importance of chronic and noncommunicable illness, the ageing of the population and the increased emphasis on social policy solutions to health issues, a multidimensional classification is urgently needed. As a product of a worldwide consensus-building effort, the revised ICIDH (renamed *International Classification of Impairments, Activities and Participation*) will meet the need for an international common language for the consequences of diseases and other health conditions. ICIDH-2 will also provide users with operational tools for measurement and comparison.

The ICIDH-2 will provide a scientific basis for the study of functioning and disablement. It will serve as a common international language, across different users and sectors, for global data collection, research, health resource allocation and management, and social welfare programming. Because ICIDH-2 covers the human experience in all personal and societal domains, it can provide the basis for empirically-grounded policy and legislative change.

The ICIDH-2 favours a universal approach to functioning and disablement, in contrast to the minority model that sees disablement as a defining attribute of a minority of people. Disablement is a universal feature of humanity, manifested for everyone in different levels of functioning.

Similarly, since human functioning and disablement can only be understood against the background of existing social and physical factors, the ICIDH-2 includes a classification of contextual factors, i.e. environmental and personal factors that modulate the experience of disablement for individuals.

Arising out of a multisectoral partnership involving both providers and consumers, the ICIDH-2 points in the direction of an invigorated international partnership in health care management. As a framework for disablement, the ICIDH can further the commitment of the United Nations to an international disablement social policy founded on human rights and the universality of disablement.

and how that provision is to be funded. One obvious way of making adequate services available to the larger numbers needing them is to impose higher taxes on the working population. Increasing taxes, how-

As people live longer,
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to take better care
of themselves.

ever, is politically unpopular and many governments are under pressure to reduce taxes rather than raise them, which implies a reduction rather than an expansion of the services in question.

Most countries are now seeking alternative types of welfare package, such as combinations of public sector and private sector health insurance and pension schemes, funded by direct or indirect taxation and voluntary contributions, that will ensure long-term care for older people. Sweden has one of the most systematic strategies, with a wide range of services for older people. Commercial long-term care insurance plans are rapidly expanding in the United Kingdom. In Germany, funding for such insurance is predominantly public. A public long-term care insurance programme is likely to be introduced in Japan in the next few years. Half the costs will be paid by premiums levied on all those older than 40 years, and half will come from general taxation. In Australia, most long-term care is provided by the private sector through a mix of profit and non-profit organizations. New forms of partnerships between governments and private health insurers are being considered by some countries, based on schemes already in existence in some parts of the United States. This “mixed approach” to funding the dependency of older people at a level broadly capable of meeting needs for care, assistance and accommodation, appears to be gaining support.

The individual challenge

As people live longer, they must plan throughout life to take better care of themselves, on the assumption that a large proportion of their lives will extend beyond what has been traditionally regarded as their most productive years. Although “older people”

have long been recognized as a distinct social category, the starting-point of socially defined old age today is becoming less clear. In many countries, old age and the socially accepted roles associated with it are undergoing radical change. Old age is no longer accepted unquestioningly as beginning at a fixed chronological age, such as the point of retirement from work or the state pensionable age of 60 or 65 years.

In industrialized countries during much of the second half of the 20th century, most people were led to expect an abrupt transition from full-time work to full-time retirement at an age when many of them felt reasonably fit. They also assumed that retirement pensions and welfare services provided by the state would be adequate to cover their needs in old age. These expectations are now being fundamentally altered, by individuals, employers and governments. Individuals are being encouraged to prepare for old age financially by saving and investing more, and staying longer in work.

Many people do not want to retire at 60 or 65; about a third of respondents in a survey in the United States felt they had been forced by circumstances to retire earlier than they wanted to. In Canada it has been estimated that about 25% of retirees left the workforce involuntarily. The German government has introduced measures to make the transition to retirement more flexible, increase the effective pension age, reduce occupational health risks and stimulate the creation of new jobs adapted to the needs of older workers. People who want to work longer are being encouraged to do so; many of them feel obliged to do so, because of financial insecurity and uncertainties about future levels of state assistance.

Remaining productive, however, depends on remaining in good

enough health. Individuals therefore must take greater responsibility for their health at the earliest opportunity. This means adopting habits such as a healthy diet, adequate exercise, and avoidance of tobacco early in life, and maintaining them for the rest of their years.

Although hereditary factors play an important role in determining life expectancy and health, the individual's lifestyle is, along with the environment, one of the greatest modifiable influences. Health promotion, which is aimed at every other age group, does not exclude older people. Rather, it aims to stimulate habits and lifestyles conducive to a better old age, and can make a crucial difference in determining how different individuals reach old age. This notion has been encapsulated by the term "healthy ageing", and is a concept actively promoted by WHO and other agencies. Many countries now have health promotion programmes designed specially for older individuals, covering areas such as physical exercise, healthy nutrition, prevention of frailty and injury and chronic disease management.

The gender challenge

Women make up the majority of the older population in virtually all countries. In at least 67 developing countries, the projected increase in the number of women aged over 65 years between 1997 and 2025 exceeds 150%. During the same period, the number of older women in Asia (presently 107 million) is projected to soar to 248 million, and in Africa, from 13 million to 33 million.

Women have different circumstances, challenges and health concerns from men as they age. Older women are more likely to be widowed, to live alone and to live in poverty. Largely this is because globally

women live longer than men – an average of eight extra years in developed countries – and tend to marry men older than themselves. However, some of women's extra years are accounted for entirely by years of dependency. In the United States, this means that while only one in seven men who attain the age of 65 can expect to spend a year or more in a nursing home before death, one woman in three at 65 has the same prospect.

For women in developing countries who survive the early life span stages to reach middle age, life expectancy approaches that of women in developed countries. By far the major factor explaining this trend is reduced maternal mortality, due to declining fertility and improved maternal care. Life expectancies at age 65 show much greater similarity between developed and developing countries, at around 19 and 15 years respectively. The gap will narrow as mortality declines not only at younger ages but also at later ages. The main trend in ageing in developed countries is the increase in the oldest old, that is, those 85 years and older. The great majority of this age group are women, and this trend will continue in the foreseeable future.

As women live longer than men, the quality of their longer life becomes of central importance. Quality of life, measured in terms of older women's capacity to maintain physical, social and mental well-being notwithstanding varying levels of illness and disability, is of as much relevance as increased life expectancy and years of life free of disability. The major preventable causes of morbidity and mortality all take effect over extended time periods. Primary prevention strategies will be most effective when initiated as early as possible. Coronary heart disease, stroke and lung cancer are the conditions which primary prevention needs to address, while sec-

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ondary prevention strategies are applicable to other cancers.

Taking action to improve the health of ageing women is imperative if they are to achieve an acceptable quality of life in their extended old age and if all societies are to avoid the consequences that otherwise will ensue. The health of older women therefore receives special attention in the following section. However, the very fact that it is a special issue illustrates another reality: by this stage of women's lives, most of their male contemporaries have died. The reasons why men die sooner than women is also an issue which needs further investigation.

The health challenge

Ageing is a normal dynamic process. It is not a disease. While ageing is inevitable and irreversible, the chronic disabling conditions that often accompany it can be prevented or delayed, not only by medical interventions but more effectively by social, economic and environmental interventions.

The longer older people remain in good health, disability-free and productive, the better will be their quality of life and the greater their contribution to society, and – perhaps – the smaller will be the cost of providing health and social services for them. Equally, the longer the health of the working population can be sustained without disability, the more productive it will be and the more able to support older dependants. This will also benefit the working population as it ages.

Healthy life expectancy is influenced by a relatively small number of chronic disabling conditions that become more common with increasing age. They include circulatory diseases, such as cardiovascular disease and stroke; cancers; musculoskeletal conditions such as arthritis and oste-

oporosis; neurological or mental disorders such as dementia and depression; degenerative disorders such as loss of sight and hearing; and chronic obstructive pulmonary disease.

The paramount health challenge must be to prevent, postpone or treat these conditions. It is a challenge best met by a partnership of individuals and health care providers. The great variation in rates of chronic diseases around the world shows that many can in fact be prevented, or at least delayed. For example, age-specific rates for cardiovascular disease have halved in Japan and the United States in the past 30 years. Cancer and heart disease are more related to the 70-75 age group than any other, but beyond 75 years exists another population – the oldest old who have survived this hazardous phase of life. They have now become more prone to impairments of hearing, vision, mobility and mental function.

The following section refers to the major chronic conditions mentioned above, with special reference to their significance in women.

Circulatory diseases

The increasing number of older people in all societies and the high burden of cardiovascular disease (CVD) in older people make it urgent that appropriate health policy recommendations are made for this group. Over 80% of deaths from CVD occur in people over 65. Worldwide, CVD is the leading cause of death and disability in people over 65, but there is great potential for treating it.

The high prevalence of CVD risk factors in older people, particularly raised blood pressure and raised serum cholesterol, suggests the need for widespread treatment. Management of mild elevations of blood pressure can be achieved by non-pharmacological measures, including reduction

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of salt and excess alcohol consumption, and physical activity. Moderate to severe hypertension can be treated with diuretics and beta-blockers.

Elevated serum cholesterol is common in older people and is a risk factor for coronary heart disease (CHD) in both men and women, and this relationship persists into very old age. As with younger people, drug therapy should be considered only after serious attempts at modifying diet have been made.

Intervention trials have shown that reduction of blood pressure by 6 mm Hg reduces the risk of stroke by 40% and of heart attack by 15%, and that a 10% reduction in blood cholesterol concentration will reduce the risk of coronary heart disease by 30%. Dietary changes seem to affect risk factor levels throughout life and may have even more impact in older people. Relatively modest reductions in saturated fat and salt intake, which would reduce blood pressure and cholesterol concentrations, could have a substantial effect on reducing the burden of cardiovascular disease. Increasing consumption of fruit and vegetables by one to two servings daily could cut cardiovascular risk by 30%.

Cigarette smoking is the most important modifiable risk factor for CVD in young and old alike. Fortunately it is usually less prevalent in older people than in younger people. The dramatic decline in cigarette smoking in some wealthy countries shows that smokers can be persuaded to give up.

For example, in the United States smoking declined in men aged 65 and above from 28% in the mid-1960s to 15% in 1990. However, in women in the same age group there was an increase from 10% to 12%. Reductions in stroke and CHD rates from smoking cessation increase as time since

quitting increases, but some benefits are realized immediately. For example, stroke risk decreases after two years' abstinence and becomes the same as that of never-smokers after five years.

In developed countries, there has been a consistent decline in stroke mortality over the last 40 years, with an acceleration in this decline in the mid-1970s. The fall in stroke deaths has been greater than that in deaths from CHD. For example, in Canada, Japan, Switzerland and the United States stroke mortality has declined by more than 50% in men and women aged 65-74 since the 1970s. Although the reasons are not fully understood, the limited evidence available suggests that a decline in case-fatality may be related to decreased severity of the disease, with the acute event becoming more mild, probably as a result of prevention efforts. Improved management in the acute phase may also have contributed.

As increasing age is considered to be the main risk factor for stroke and circulatory diseases more generally, the burden of these diseases will become heavier as greater proportions of the population in developing countries reach older ages.

Coronary heart disease and stroke are the major causes of death and disability in **ageing women**. The common view that they are men's health problems has tended to obscure their significance for ageing women's health and there is a need to bring their importance into sharper focus. They account for close to 60% of all adult female deaths in a typical developed country, and are also the major cause of death among women aged 50 years and above in developing countries. In the majority of developed countries for which trend data are available, declines in death rates from heart disease and stroke have been greater for women than

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men, but cardiovascular disease will continue to be the major health issue for older women. Improvements in death rates have been much smaller in many developing countries.

Women are usually 10 years older than men when symptoms of heart disease first appear, and may be up to 20 years older before a heart attack occurs. In the United States, 55% of women over 75 years with coronary heart disease are disabled by their illness. The disease will probably become epidemic in older women unless they take preventive action throughout their lives, yet studies show that women do not usually count heart disease among the health problems they consider most important.

The impact of increased smoking rates among women is now becoming more evident. Death rates from smoking-related diseases have plateaued in men whereas they are increasing in older women. Cigarette smoking by women has not yet become widespread in developing countries, and there is still time to take global action to protect older women from diseases due to smoking.

Cancer

The gradual elimination of other fatal diseases, combined with rising life expectancy, means that the risks of an individual developing cancer during his or her lifetime are steadily increasing. Most cancers arise at an advanced age, and the risk increases steeply with age. The cancer burden is therefore much more important in populations having long life expectancy, relative to other groups of diseases.

As shown in *The World Health Report 1997*, the average age at death from six of the most common forms of cancer ranged from 61 to 69 for a sample of six countries. In France and the United States, breast cancer on

average deprives women of 10 years of life expectancy, while prostate cancer reduces male average life expectancy by only one year.

As a result of medical advances, one-third of all cancers are preventable, and a further one-third, if diagnosed sufficiently early, are curable. For the remaining one-third, appropriate palliative care can bring about substantial improvements in the quality of patients' lives.

The five leading cancer killers worldwide are also the five most common in terms of incidence. Together they account for about 50% of all cancer cases and deaths. Among men, the leading eight killer sites for cancer are the lung, stomach, liver, colon-rectum, oesophagus, mouth-pharynx, prostate, and lymphoma. In women they are cancers of the breast, stomach, colon-rectum, cervix, lung, ovary, oesophagus and liver. The major killer cancer in women in developing countries is breast cancer, followed by stomach cancer. In developed countries, breast cancer also ranks first, followed by colorectal cancer.

An analysis of the risk factors involved in the development of the major cancers shows that a few major factors dominate – tobacco, diet, alcohol, infections and hormones – all of which lend themselves to preventive actions. The long latent period for most cancers dictates the importance of early detection.

In terms of prevention, screening for cervical cancer has contributed to steep declines in this disease in many countries. To combat breast cancer, mammography is now generally proposed for women over 50 in those countries where the disease has a high incidence. Prostate cancer, most common in men over 70 years, also lends itself to early detection, although the value of screening is debated.

Lung cancer is the most preventable of all cancers as over 90% is at-

tributable to smoking. Levels of morbidity and mortality among older women due to lung cancer are now similar in developed and developing countries, and likely to grow worldwide, given the increasing numbers of women who smoke. Lung cancer in women has increased fourfold over the last 30 years in many developed countries, and has overtaken breast cancer as the leading cause of cancer death in women in the United States, where women first took up smoking in large numbers. This pattern is being repeated elsewhere in developed countries, where between one-quarter and one-third of women have started smoking. In many Latin American countries, up to two-thirds of young women smoke; levels are considerably lower in most African and Asian countries.

Chronic obstructive pulmonary disease (COPD)

This category includes chronic bronchitis and emphysema, which are especially prevalent in older age groups. Although these conditions are more common in men, their prevalence in women will undoubtedly increase, because cigarette smoking is the main risk factor, and smoking among women is globally on the rise. The direct cost of managing COPD, which frequently requires hospitalization, is high. Most deaths due to COPD occur after the age of 65.

Musculoskeletal conditions

These conditions reduce mobility and agility, and so have a major impact on self-care. For ageing men and women, exercise is an important preventive activity against all major musculoskeletal conditions. Yet few older women exercise on a regular basis in developed countries. Lack of exercise and inappropriate nutrition

have led to an increase in the proportion of women who are overweight or obese. By contrast, in developing countries it is the excessive physical demands on women throughout their life that most adversely affect physical strength and mobility. Dealing with heavy loads leads to damage of the joints. In addition, nutritional deficiencies reduce the physical strength of women as they age. In developed countries, undernutrition is a problem among the oldest of old women.

Osteoporosis and associated fractures are a major cause of death, illness and disability, and a cause of huge medical expense worldwide. Bone fractures are the main complication, and given that they are most common in older people, the influence of increasing life expectancy on the number and regional distribution of hip fractures will be dramatic. Worldwide, it is estimated that the number of hip fractures could rise from 1.7 million in 1990 to around 6.3 million by 2050. Women represent 80% of those who have a hip fracture; their lifetime risks for osteoporotic fractures are at least 30% and probably closer to 40%. In men, the risk is 13%.

Women are more prone because their bone loss accelerates after the menopause. Prevention is possible with hormone therapy at the menopause. Lifestyle factors are also associated with osteoporosis (diet, physical activity, smoking), opening a perspective for primary prevention. The primary aim is to prevent fractures: this may be achieved by increasing bone mass at maturity, by preventing subsequent bone loss or by restoring the bone mineral. Lifestyle modifications, particularly increased calcium intake and physical activity, could be of great importance.

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Dementia

The ageing of the global population will inevitably result in significant increases in the number of cases of dementia, of which the incurable Alzheimer disease is the most common form. The risk of developing dementia rises steeply with age in people over 60 years. Alzheimer disease is a brain disorder characterized by gradual onset and progressive decline in cognition. The average course of the disease is approximately a decade, with a range of 3 to 20 years from diagnosis to death. As the disease advances, memory is increasingly lost, and changes in mood and behaviour follow.

The possibilities for prevention are extremely limited because the major determinants – age, genes and family history – cannot be modified, and an effective treatment is yet to be found. However, recent progress in understanding the diagnosis and pathogenesis of Alzheimer disease and related disorders has benefited many patients. Early and accurate diagnosis avoids the use of costly medical resources and allows patients and family members time to prepare for future medical, financial and other challenges. While no current therapy can reverse the progressive cognitive decline, several pharmacological agents and psychosocial techniques have been shown to provide relief for the depression, psychosis and agitation often associated with dementia.

Generally, the management of dementia is based on long-term care, preferably at home, with support from a community-based health team. Living with and caring for a person with dementia can be very burdensome and caregivers are at high risk of becoming exhausted. The needs of these carers should be kept in mind when planning services for people with dementia. Women are

more likely to suffer than men because of their greater longevity. Most of those caring for people with dementia are ageing women, either spouses or adult daughters.

Blindness and visual impairment

These are major causes of disability in older people, especially in developing countries where there are fewer resources for prevention and treatment. At present, about 25 million older people are blind; the number is expected to double by 2020.

WHO's response

In 1979 the World Health Assembly adopted its first resolution specifically targeted to health care of older people, which led to the establishment of a global programme. Its goals were to promote health and well-being throughout the entire life span and to assist Member States in developing strategies to ensure the availability and provision of comprehensive and holistic health care to older populations.

A policy paper prepared by WHO for the 1982 World Assembly on Ageing convened by the United Nations provided a basis for the Vienna International Plan of Action on Ageing which became the framework for WHO activities between 1982 and 1987. The Plan encouraged Member States to develop demographic and health profiles; to formulate programmes for community-based health care for ageing individuals, with special focus on health promotion and self-help care; and to advocate issues related to the health of older people with scientific and professional organizations.

WHO organized scientific meetings on ageing-related issues such as nutritional status, cardiovascular dis-

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eases, mental health, prevention of respiratory infections, family life and support, prevention of accidents, and health promotion. Published in 1984, *The uses of epidemiology in the study of the elderly* stimulated new approaches to research on ageing. Activities from the late 1980s to the mid-1990s were focused on determinants of healthy ageing, osteoporosis and age-associated dementias. In 1994, the programme was reoriented towards “ageing and health”.

Today, the WHO programme deals with both old age and ageing. It sees older people as not compartmentalized but part of the life cycle. It emphasises health promotion, with a focus on healthy ageing, or ageing well. It takes account of gender differences evident in both health and ways of living, and the cultural settings in which individuals’ age determine their health in older age. It is concerned also with strategies to maintain cohesion between generations and the many ethical issues of population ageing.

An expert committee on determinants of healthy ageing is scheduled to meet in 1998 to discuss these perspectives in depth. This committee’s guidance will be sought on how WHO and its Member States can best play a major role in presenting the health component of the International Year of Older Persons (1999).

Other WHO activities are directed towards specific aspects of the health of older people. For example, the main strategies for preventing blindness and deafness have focused on the development of national programmes based on primary health care

More than 100 countries have set up blindness prevention programmes, and many of these have been highly successful in reducing certain causes of blindness, such as trachoma. The main constraints are insufficient resources for large-scale provision of care, such as cataract surgery. Recent developments in new, low-cost technology are very promising (e.g. intraocular lenses), but need to be made available on a large scale in developing countries.

During 1997, a WHO Alliance for the Global Elimination of Trachoma was established, to intensify action against that disease together with interested nongovernmental organizations and other partners, making use of new methods for rapid assessment and more effective treatment of the disease. Other collaborative activities have included support to cataract surgery in Africa, planning for eye care in China and in Haiti, and an economic analysis of blindness prevention. WHO has also undertaken applied research, in collaboration with the United States National Eye Institute on cataract surgery in India, and specific evaluations of national programme results in China and Nepal.

In the Americas, 26 countries are developing ocular health services to address the major problems of cataracts, diabetic retinopathy, glaucoma, and the need for inexpensive eyeglasses.

Work for the prevention of hearing impairment has included field-testing of uniform assessment procedures in selected countries, and development of strategies against noise-induced hearing loss.

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