Chapter VI
Health and long-term care systems for ageing societies

Introduction

The health profile of populations has changed in parallel with the demographic transition. The importance of communicable or infectious diseases has declined and that of non-communicable or chronic diseases has increased. This phenomenon is referred to as the epidemiological transition. Its implications, particularly for the delivery of health and long-term care services to older persons, will be examined in the present chapter.

The epidemiological transition has already taken place in developed countries, and is now under way in many developing countries

In most developed countries, the epidemiological transition took place in the nineteenth and the early twentieth century. Developing countries are now at various stages of the transition, but taken as a group they are forecast to face a dramatic shift in the early part of the twenty-first century. There will be a major shift in the occurrence of deaths from predominantly among younger ages to mainly among older ages and from deaths due to communicable disease or maternal or prenatal causes to deaths due to non-communicable disease. Global HIV/AIDS deaths are projected to rise dramatically; on the other hand, the proportion of deaths due to non-communicable diseases is projected to rise from 59 per cent in 2002 to 69 per cent in 2030 (Mathers and Loncar, 2006). Ischaemic heart disease and stroke followed by cancer, chronic lung diseases and diabetes mellitus will become the main causes of death in the world. Notably, these causes of death share many of the same key risk factors: tobacco use, unhealthy diets, lack of physical activity and alcohol abuse.

Public-health interventions contributed to the start of the demographic and epidemiological transitions

The demographic and epidemiological transition in developed countries took place over a long timespan. Increased life expectancy reflects improvements in nutrition and the success of public-health interventions on various fronts, including improvements in public systems for providing clean drinking water and for disposing of human and animal wastes and for ensuring the quality of food products, such as through the pasteurization of milk, as well as educational campaigns promoting healthy practices in matters of infant care, personal hygiene, sound nutrition, use of tobacco, alcohol and other drugs, sexual habits and so on.

Many of these interventions were made possible thanks to substantial advances in medical knowledge dating from the middle of the nineteenth century. Improvements in the medical treatment of sick individuals advanced dramatically in the latter half of the twentieth century, especially following the development of antibiotic drugs as well as therapies for the effective management of cardiovascular disease. Most developed countries are already preparing for population ageing and have undertaken scenario analyses of the social and economic implications, in part out of concern for possible future strain on national and budgetary resources, especially in relation to the financing of pension and health and long-term care systems.

Developing countries face a double burden of disease

The demographic transition in developing countries is taking place at a much faster pace. The health-care challenge for these countries is therefore generally much larger, as their health-care systems still have many deficiencies in respect of addressing diseases for which the younger population is most at risk, while the rapid ageing process has already led to much greater demands for health care by older persons. Out of an estimated 58 million deaths in the world from all causes in 2005, chronic diseases accounted for 35 million (60 per cent); and 80 per cent of chronic deaths are considered to have occurred in low- and middle-income developing countries, primarily because these countries contain most of the world's population, but also, partly,

because the developing world is experiencing rapid ageing and the need to address the greater health needs of older persons (World Health Organization, 2005, pp. 2 and 4). Concurrently, communicable diseases still constitute the major causes of death in many developing countries. Many developing countries thus face a double burden of disease: the large death toll and ill health associated with both communicable and non-communicable diseases.

Developing countries need to expand and reform their heath-care systems so as to manage the double burden of disease. The establishment of prevention programmes to delay the onset of diseases and of formal systems for catering to the special needs of older persons, including long-term care if needed, is required. Moreover, such expansion must be accompanied and supported by a strong political commitment to expand health-care coverage and strengthen the administrative capacity of various levels of the Government. An additional reason for increased involvement of different levels of government is that family- or community-based informal support for older persons is under growing pressure due to falling fertility rates, smaller family sizes, increased longevity of older persons and changing cultural norms regarding caring for older persons, as discussed in chapter III.

Developing countries need to expand and reform their health-care systems so as to manage this double burden

This chapter argues that, while the challenges are large, they are not insurmountable. The analysis shows that population ageing is a factor, but not always the main factor, in rising health costs. Estimates of future health costs for an ageing population vary and are subject to much uncertainty, but, as analysed below, most studies concur that the impact of ageing per se would be to increase public-health expenditures by a range of from about 1 to 3 percentage points of gross domestic product (GDP) over several decades. Similar figures apply for the future increase in public spending for long-term care in the developed countries, although very much depends on the design of systems of health-care delivery and financing.

Ageing is a factor in increasing health costs, but not the main one.

Other factors besides ageing are pushing up health costs and much will depend on whether the prices of health-care provisioning and medicine can be contained. The challenges will differ from context to context and will reflect the stages of the demographic and epidemiological transitions that countries have reached. Action will be required on many levels to provide in an affordable manner for the health needs of the whole population, including older persons. Taking into account the expected speed of the demographic and epidemiological transitions, all levels of government will have to re-examine the way in which health-care services are provided to the population in general and to older persons in particular; the way in which the system that eventually emerges is financed by both public and private sectors; and the ways in which the ability of society to offer special programmes for older persons can be enhanced. However, there is little question but that the size of the health sector in the economy and public expenditures on that sector will tend to increase over time, even if efforts are made to contain the increase in costs; but as this expansion has been foreseen and is taking place over time, it should normally be manageable in a country that sees a steady rise in per capita incomes. As much of this expansion can be foreseen as part of a long-term trend, economies can be made to adjust to it gradually over time.

Epidemiological transition and population ageing

Mortality decline and the epidemiological transition

The epidemiological transition implies a shift from the predominance of infectious diseases at younger ages to that of non-communicable diseases at older ages

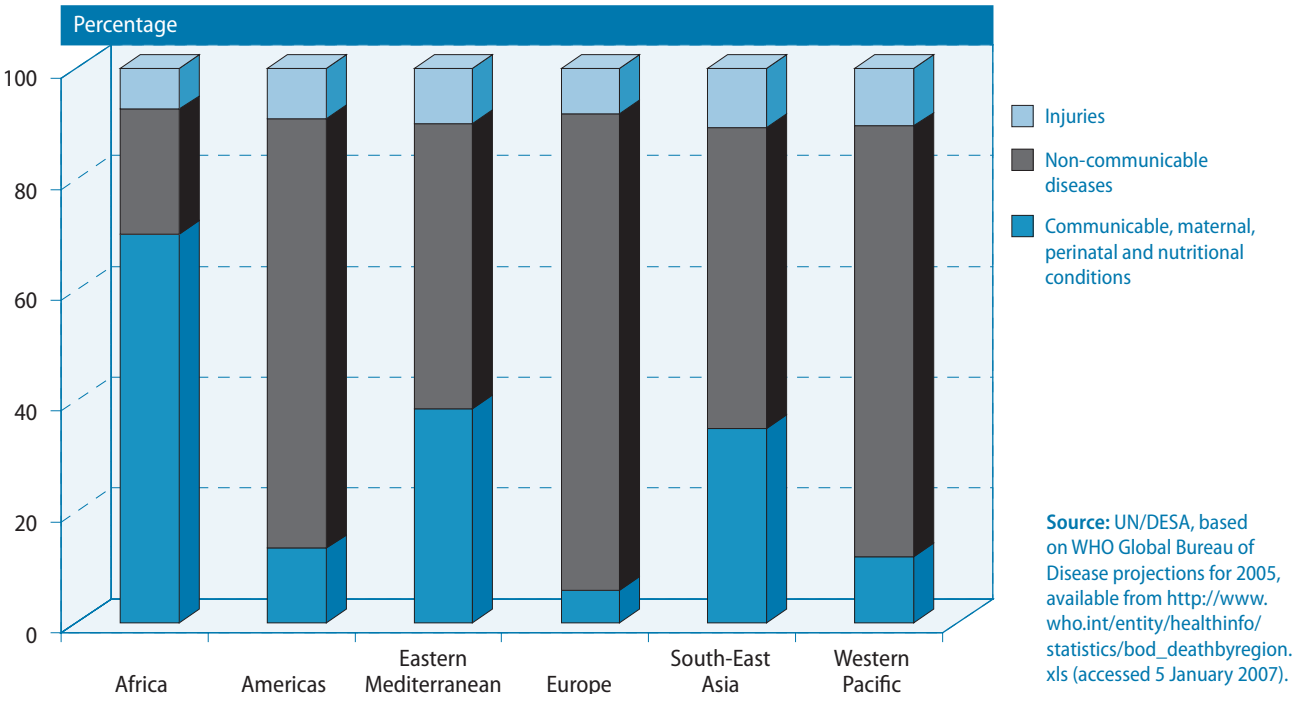
In pre-transitional, high-mortality populations, infectious and parasitic diseases were the dominant causes of sickness and mortality, and a large proportion of deaths occurred at younger ages. Mortality rates were high across the age range, but infants and young children were particularly vulnerable. Chances of survival improved, especially among children, as the risk of *infectious* disease was reduced through improvements in sanitation, hygiene, nutrition and medical therapy. As more and more individuals survived to adulthood and even to old age, they were increas-

ingly exposed to the risk factors associated with *chronic* diseases. Over time, non-communicable, chronic and degenerative diseases became the foremost causes of morbidity and mortality, so that the vast majority of deaths now occur at older ages in the countries that have completed this transition.

The epidemiological transition in developing countries accelerated in the second half of the twentieth century

In developing countries, this transition started later than in developed countries and was particularly rapid in the second half of the twentieth century. Large differences remain in the epidemiological profiles of various regions. Figure VI.1 illustrates regional differences in the breakdown of causes of death into three major groups: (a) communicable, maternal and perinatal, and nutritional causes; (b) non-communicable chronic diseases; and (c) injuries. In the figure and the following discussion, countries and other areas are grouped into regions according to the classification framework used by the World Health Organization (WHO).

Figure VI.1.
Distribution of deaths by major cause group, WHO regions, 2005



Source: UN/DESA, based on WHO Global Bureau of Disease projections for 2005, available from http://www.who.int/entity/healthinfo/statistics/bod_deathbyregion.xls (accessed 5 January 2007).

In Africa, communicable diseases are still predominant

In Africa,[1] 70 per cent of deaths in 2005 were attributable to the first group of causes, whereas 23 per cent were due to chronic diseases, reflecting the fact that this region is still at an early stage of the epidemiological transition. Sub-Saharan Africa, in particular, has been severely affected by HIV/AIDS, with an estimated 24.7 million HIV-positive individuals in 2006, although in several affected countries, the pandemic has slowed or reversed a downward trend in mortality. Moreover, associated infectious diseases, such as tuberculosis, have continued to rise. Available data indicate that by 2006 more than 25 million people worldwide had died of AIDS and an additional 39.5 million were living with HIV (UNAIDS 2006; UNAIDS and World Health Organization, 2006).

1 Comprising all African countries except Egypt, Libyan Arab Jamahiriya, Morocco, Somalia, Sudan and Tunisia.

Non-communicable diseases are predominant in other developing countries

Two other WHO regions, South-East Asia[2] and the eastern Mediterranean,[3] also have a substantial burden of disease from the first group of causes, but more than half of the deaths in these regions are now due to non-communicable diseases. In Europe, on the other hand, the vast majority of deaths are attributable to non-communicable causes.[4]

The differing epidemiological profiles of the various regions reflect their age patterns of mortality. For the developing world as a whole, deaths in 2000-2005 were distributed relatively evenly across the age span, with 29 per cent taking place under age 15, 30 per cent among adults aged 15-59, and 42 per cent among adults aged 60 years or over. In sub-Saharan Africa, however, children under age 15 had the highest number of deaths (estimated at 47 per cent of total deaths), reflecting the large burden of communicable, prenatal and nutritional causes. Another 38 per cent of deaths, many of which were caused by the HIV/AIDS epidemic, took place among adults aged 15-59; maternal mortality, injuries and chronic diseases leading to early death were also important causes. The patterns observed in sub-Saharan Africa mark a strong contrast with those in developed countries, where deaths were concentrated among persons aged 60 years or over (80 per cent) and only 1 per cent among children under age 15. Yet, non-communicable diseases are becoming increasingly important as causes of death in low- and middle-income countries; moreover, they tend to occur at younger ages than in high-income countries (World Health Organization, 2006b).

With increased longevity, death has become more concentrated at advanced ages

With continued medical advances, most developed countries experienced continued declines in mortality in the second half of the twentieth century as deaths from non-communicable diseases, particularly cardiovascular disease, took place later in life. France, where between 1971 and 2002 the estimated level of life expectancy at age 65 rose from 16 to 21 years for men and from 21 to 26 years for women (United Nations, 2006b), is a representative case among developed countries. With increased longevity, death has become increasingly concentrated at advanced ages: for example, in 2000-2005, more than 80 per cent of deaths in France took place at ages 65 and above and 50 per cent occurred at ages 80 and above.

In some countries, mortality has increased even if the epidemiological transition has taken place, owing to assorted social, economic and behavioural causes, including accidents, violence and substance abuse, which are often a reflection of stress caused by the profound changes in socio-economic conditions (Kinsella and Phillips, 2005). In the countries of Eastern Europe, infectious diseases had been largely controlled by the 1960s, but mortality from cardiovascular disease continued to rise; and during the period of central planning, the region did not see the health advances witnessed by its Western neighbours, some of which had started off with lower life expectancy (United Nations, 1997b, p. 25). In the early 1990s, several countries of the former Soviet Union experienced a marked worsening of mortality from cardiovascular disease and external causes, particularly for men. In the Russian Federation, the death toll in recent years has been particularly high for working-age males.

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2 Comprising Bangladesh, Bhutan, Democratic People's Republic of Korea, India, Indonesia, Maldives, Myanmar, Nepal, Sri Lanka, Thailand and Timor-Leste.

3 Comprising Afghanistan, Bahrain, Djibouti, Egypt, Iran (Islamic Republic of), Iraq, Jordan, Kuwait, Lebanon, Libyan Arab Jamahiriya, Morocco, Oman, Pakistan, Qatar, Saudi Arabia, Somalia, Sudan, Syrian Arab Republic, Tunisia, United Arab Emirates and Yemen.

4 In fact, more than half of all deaths in this region have been due to cardiovascular disease. The region comprises all of the Commonwealth of Independent States (CIS), Europe (including Turkey) and Israel.

Health and disability in the older population

Some non-communicable diseases often bring about a long period of poor health

While episodes of communicable disease can have disabling consequences, non-communicable diseases, such as cardiovascular disease and cancer, often bring about a long period of poor health and diminished functioning. In addition, some non-fatal (but often chronic) conditions can have an important impact on the quality of life and health-care costs for older individuals. Examples of such conditions include hearing and vision loss, musculoskeletal conditions such as osteoarthritis, and cognitive impairments including Alzheimer's disease and other dementias.

The evolution of health status at older ages has implications for health systems

With populations ageing rapidly in developed countries, as well as in many developing countries, the evolution of the health status of older persons has broad implications. Increased life expectancy is usually considered to be a favourable outcome of social and economic development, but how healthy are the added years of life? If medical treatments postpone deaths from chronic conditions but do not delay the onset of the conditions themselves or their disabling consequences, the result could be an expansion of morbidity and disability over the life course of individuals. Alternatively, if the same forces that delay death also delay the onset of chronic conditions, then morbidity and disability could be contracted into a shorter period (representing the so-called compression of morbidity).

The prevalence of chronic disease and morbidity seems to have declined—or been delayed—over the long term

Little information is available about long-term trends in the incidence or prevalence of chronic disease and morbidity. One set of data provide information about white veterans of the Union Army of the United States of America, who fought in the American Civil War of 1861-1865. These veterans had been subject to regular medical check-ups and, at the beginning of the twentieth century, would have been between about 60 and 64 years of age. Only 10 per cent of this cohort was found to be free of chronic disease conditions. By contrast, survey data from 1994 indicated that 25 per cent of white males of the same age group were free of such conditions. Similar evidence indicates that the average age of onset for heart disease rose from 56 at the beginning of the twentieth century to 65 at the end of the century; for arthritis, the rise was from age 54 to age 65. Thus, the average delay in the onset of chronic conditions over the century was more than 10 years, whereas the average increase over the same period in male life expectancy at age 50 in the United States was about 6.6 years (Fogel, 2004). Significant factors underlying the declines in chronic disease observed during the twentieth century included reduced exposure to infectious diseases in childhood and young adulthood, occupational shifts leading to changes in the nature of work and working environments, and increases in average body size.

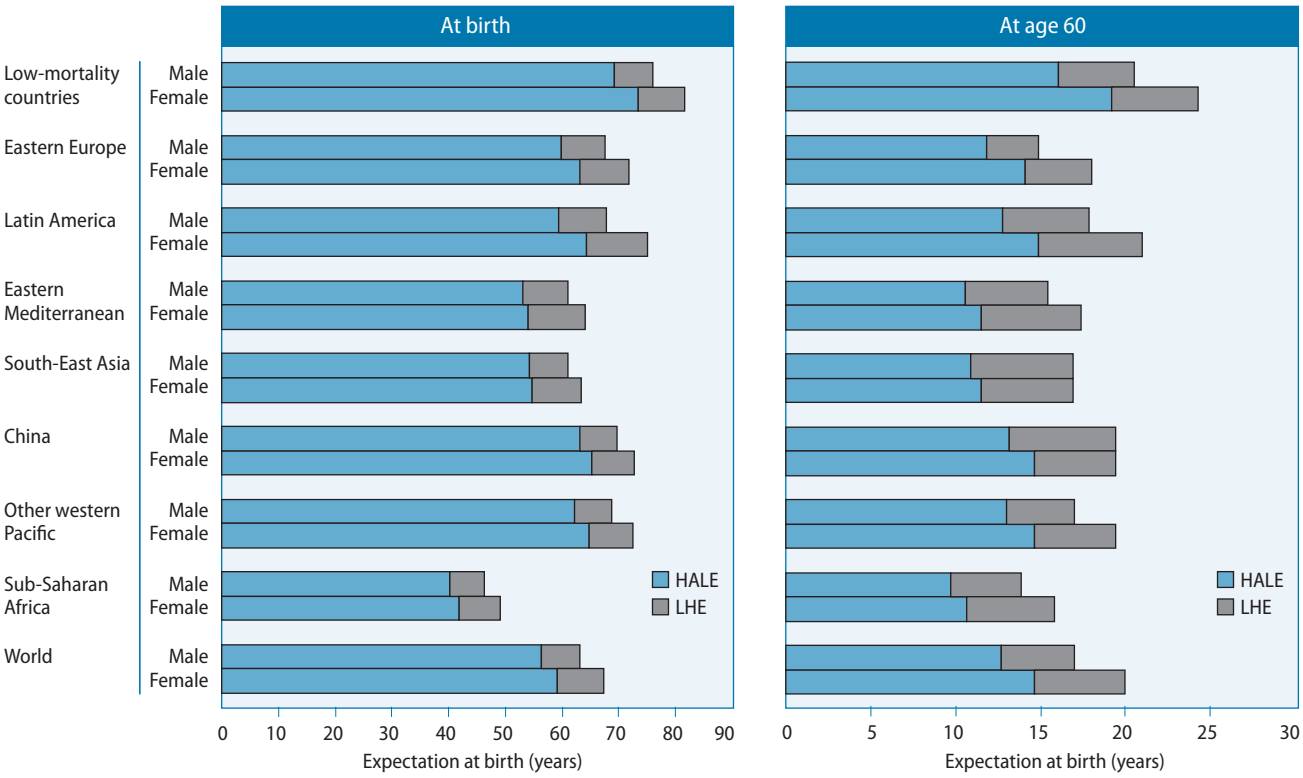
Several health indicators designed to measure "healthy life expectancy" have been proposed

More recently, several health indicators designed to examine whether a compression of morbidity and related changes are taking place in a similar fashion in various populations have been proposed. Among these measures, a few variants under the rubric of "healthy life expectancy" are perhaps the most widely used. They measure how many years a person can expect to live in a healthy state, given current rates of mortality, morbidity and disability. Since, by definition, healthy life expectancy can be no greater than total life expectancy, a comparison of the two statistics provides an indication of the relative length of life spent in good as opposed to bad health. There are various definitions of "healthy"—it can mean living in the absence of all disease, or of severe disability, or of even mild disability—and thus healthy life expectancy can be computed in various ways. These computations have different names, including "active life expectancy", "disability-free life expectancy" and "health-adjusted life expectancy (HALE)". It should be noted that using these measures for comparing levels of healthy life expectancy across countries remains difficult, particularly because the resultant indicators are influenced by whether they are based on diagnosed conditions or self-reported health status, by the specific questions asked or the definitions applied to assess health and disability in surveys, and by cultural differences in the perceptions of health.

Women tend to spend a longer period of their (longer) lives in poor health, and people in developing countries spend a greater fraction of their total life in poor health

Despite these problems of comparability, a few general conclusions can be drawn from the available evidence. Most studies have found that women have longer life expectancy compared with men, but also spend a longer period of their life in poor health (Romero, da Costa Leite and Landmann, 2005). Another common finding in these studies was that people in developing countries are likely to spend a greater *fraction* of their total lifespans in poor health. In developing countries, the onset of both fatal and non-fatal diseases tends to occur at younger ages than in developed countries. As a result, when developed and developing countries are compared using health-adjusted life expectancy by WHO, the estimated number of years spent with a disability is about the same in both groups of countries. Figure VI.2 presents the WHO estimates by sex of total and healthy life expectancy at birth and at age 60 for developed and developing regions. In the low-mortality countries, women typically live longer than men but spend a longer period—8.1 years for women as against 6.7 for men—in ill health at the end of their lives.

Figure VI.2.
Total and healthy life expectancy at birth and at age 60, by region and sex, 2002



Source: Mathers and others (2004).

Note: HALE refers to health-adjusted life expectancy and LHE to the expectation of lost healthy years, that is to say, to the difference between total life expectancy and health-adjusted life expectancy.

It is difficult to go beyond these broad statements about differences in healthy life expectancy between men and women and between developed and developing countries, and draw firm conclusions about trends and differences in healthy lifespan around the globe and its relationship to total life expectancy. For example, in a recent study of trends in healthy life expectancy in countries of the European Union (European Health Expectancy Monitoring Unit

(EHEMU), 2005), where one would expect comparable data to be most readily available, there were found wide variations in the estimated level of disability and different directions in trends. Although some countries showed evidence of a compression over time in the duration of morbidity across the age range, others showed evidence of an expansion. The study concluded that those conflicting results might have indicated that the estimates were still not comparable across countries, despite efforts to adjust and harmonize the data.

Another example of the difficulties of interpreting such information comes from a study in China (Qaio, 2005), which found that the active life expectancy of older persons—that is to say, the number of years of life spent disability-free—had declined between 1992 and 2000. This decline could have been due to a transition from a system of universal but often rudimentary Government-provided health care under the centrally planned economy to one characterized by an increased reliance on user fees and the privatization of many medical services, which might have been detrimental to the poor, especially in rural areas, with respect to coverage for their basic medical care. However, this conclusion constitutes only one possible interpretation of the data. Since the measure of active life expectancy was based on self-reported health in a series of surveys, it is unclear whether actual health had worsened over the study period or whether a negative reaction to changes in the health-care system and new expectations about medical care had led more people to report that they were unhealthy.

Health differentials and their implications for future trends

Higher incomes, higher levels of education and higher perceived social status are associated with healthier and longer life

Studies of older populations in developed countries have found consistent relationships between socio-economic status and levels of morbidity and mortality. In general, the more advantaged segments of those populations (comprising people with higher incomes, higher levels of education, higher perceived social status, etc.) tend to be healthier and to live longer than their less advantaged counterparts. Therefore, it is expected that future levels of health and disability will likely be influenced not only by changes in the general health environment and medical technology, but also by changes in the composition of the older population with respect to per capita income, educational levels, health status in early life and subsequent behaviour as adults.

Various studies have shown that lower levels of chronic disease and disability are experienced by those with higher levels of education. Experts have not yet reached an agreement on the exact mechanisms producing this link. Possible explanations include psychosocial effects on persons associated with different types of jobs and differential use of health knowledge and technology, and the high correlation between education and incomes and therefore the ability to pay for medical services (Cutler, Deaton and Lleras-Muney, 2005). As access to education, including higher education, is improving in most parts of the world, this should produce extra pressure for an expanded coverage and enhanced quality of health care. Moreover, the population cohorts moving into the older age range in the coming decades will be increasingly well educated, suggesting a possible beneficial effect on future trends in health and overall well-being for older persons and greater health-seeking activity by them. It should be stressed, though, that the strength of the relationship currently observed between education and health is not uniform across countries (Kinsella and Velkoff, 2001).

While better living conditions at earlier ages may have positive impacts on health in later life …

General living conditions at earlier ages, including nutritional status and exposure to communicable diseases, are known to have important impacts on health in later life. For example, exposure to the hepatitis B virus has been linked to later development of liver cancer, and acute rheumatic fever in childhood often leads to rheumatic heart disease, which is still a

significant killer of adults in developing regions (Elo and Preston, 1992). Short stature, where it is an outcome of retarded growth due to nutritional deprivation and disease in childhood, has been associated in developed countries with higher risks of mortality at older ages, particularly from cardiovascular diseases (Aboderin and others, 2002; Elo and Preston, 1992; Fogel, 2004).

… there are still many unknown factors that affect health status in later life

Nevertheless, there are still many unknowns with respect to the relationships between conditions in early life and health outcomes in later life. A WHO report concluded that it is still premature to recommend policy interventions in the early stages of life (for example, measures to increase birth weight) for the express purpose of influencing adult health, especially since evidence that these relationships hold in developing countries is still lacking (Aboderin and others, 2002).

Smoking, exercise and diet have major impacts on health

More policy-relevant are trends in individual behaviour such as smoking, exercise and diet. For example, in 2000 an estimated 4.8 million adult deaths worldwide were attributable to smoking (Ezzati and Lopez, 2004). Compared with non-smokers, smokers are at extremely high risks for many diseases. The list includes but is not limited to lung cancer, cardiovascular disease and chronic obstructive pulmonary disease. This excess risk is reduced almost immediately by smoking cessation and continues to fall with increasing length of time after cessation.

Although smoking rates have been higher historically in developed countries, more than half of all deaths attributable to smoking now occur in developing countries. These countries are beginning to experience the impact of the accumulated hazards of the increase in smoking in recent decades. In Northern America, Japan and some Western European countries, smoking rates among men have declined in recent decades. However, over this same period, the prevalence of smoking among women in these regions has either continued to rise, stabilized at high levels or declined only slightly. Smoking rates vary widely among developing countries but are generally either rising or stable at high levels. In general, smoking is much more prevalent among men than among women in these countries.

An increasing burden of tobacco-related morbidity and mortality is expected in developing countries

The mortality burden from smoking in developing countries is concentrated in a relatively young age range compared with that in developed countries, reflecting a more recent widespread use of tobacco. However, given the population growth projected for developing countries, there will be an increasing burden of tobacco-related morbidity and mortality unless steps are taken soon to reduce rates of smoking in men and to prevent increases in those rates among women.

Over time, non-communicable disease morbidity in developing countries will come to resemble that of developed countries

In developing countries, higher socio-economic status is sometimes associated with a higher prevalence of risk factors for cardiovascular disease, such as high blood pressure (Aboderin and others, 2002), since urban and other advantaged population segments are more likely to adopt "Western" lifestyles. However, as unhealthy behaviour patterns like smoking and overeating spread to larger segments of the population, it seems likely that socio-economic gradients in risk factors and non-communicable disease morbidity will come to resemble those in the developed countries, with worse outcomes among groups with lower socio-economic status.

Much of the preventable component of the non-communicable disease burden is linked to a number of risk factors that can be modified through individual behaviour. Risk factors with quantifiable causal effects on chronic diseases include high blood pressure, high cholesterol, overweight and obesity, low fruit and vegetable intake, physical inactivity, smoking and alcohol use (Ezzati and others, 2005).

Are health-care systems prepared for population ageing?

Health resources and expenditures

Health-care systems vary considerably among countries

The coverage and benefits provided by health-care systems to older persons vary considerably between developed and developing countries. The differences reflect not only the human and financial resources made available for older persons, but also societal values and views concerning the role and responsibilities of the public sector in caring for the general health of the public. Differences in the history and structure of overall social welfare programmes for income support and health care across countries therefore make it difficult to provide a general picture of the typical health-care system in developing countries (Ofstedal and Natividad, 2002).

The existing health-care systems in many developing countries face difficulties in meeting the double burden of disease

The existing health systems in developing countries, particularly low-income ones, are still mainly geared towards providing care for acute episodic conditions and not towards chronic care needs and care specific to older persons. As noted above, however, evidence from developing countries shows a high prevalence of risk factors for chronic conditions, such as smoking, alcohol, diet and weight. The missed opportunity to prevent or deal earlier in life with age-related non-communicable diseases may lead to increases in their incidence, prevalence and complications later in life.

Overall, resources devoted to the health sector in developing regions are not up to the levels observed in the developed world (see table VI.1). For the most recent year in the period 1997-2004 for which data were available, African countries, for example, had 0.1 physicians per 1,000 residents, compared with 2.7 in developed countries and 3.5 in Eastern Europe and the Commonwealth of Independent States (CIS). Furthermore, the shortage of health workers is often associated with difficult working conditions—long hours, low pay and the shortage of adequate medical supplies, for example. While these differences in health-care inputs do not necessarily translate into similar differences in the general health status of populations, the lower availability of physicians and hospital beds no doubt do adversely affect health conditions. The World Health Organization (2006a) offers evidence that the number and the level of professional skill of health workers are positively correlated with the degree of immunization coverage and primary-care outreach, which in turn are important factors in infant, child and maternal survival.

Table VI.1.
Number of physicians and hospital beds, by region, 1997-2004

	Physicians per 1,000 residents (1997-2004[a])	Hospital beds per 1,000 residents (2000-2003[a])
Developed economies	2.7	6.3
Africa	0.1	1.2[b]
East Asia and the Pacific	1.3	2.4
South Asia	0.5	0.9
Western Asia	1.5	2.3
Latin America and the Caribbean	1.8	1.9
Economies in transition	3.5	8.5

Source: UN/DESA, based on World Bank, 06 World Development Indicators (Washington, D.C., World Bank, 2006), available from www.worldbank.org/data/onlinedatabases/onlinedatabases.html.

a Data for most recent year available.
b 1990.

The emigration of health professionals (and home-care workers) from developing countries further aggravates the situation. This migration is a result of a shortage of nurses in many developed and some middle-income developing countries. Emigration of health workers from developing countries is further induced by the relatively low pay, unattractive working environment, and lack of investment in education and training in their own health sectors (World Health Organization, 2006a).

The brain drain of health professionals constrains the required expansion of health systems

Medical care and delivery are indeed becoming more of a global industry, with doctors throughout the world learning of the latest techniques being practised in the countries with the most advanced medical research facilities. While this may be to the advantage of developing countries, the brain drain of health professionals is straining the required expansion of their health systems. According to one study, already 1 in 5 practising physicians in the United States is foreign trained and it has been estimated that by 2020 the United States could face a shortage of 800,000 nurses and 200,000 doctors (Garrett, 2007, p. 15). The same study argues that unless domestic training facilities and salaries of teachers expand sufficiently in the developed countries to be able to satisfy their expanding needs for medical personnel from their own populations, the result could be a further drain of medical personnel from developing countries. The brain drain phenomenon has been particularly noticeable in Africa: for example, Zimbabwe trained 1,200 doctors during the 1990s, but only 360 remain in the country today (ibid.). In 1980, the country had been able to fill 90 per cent of its nursing positions nationwide; today only 30 per cent are filled. In Zambia, only 50 of the 600 doctors trained over the last 40 years remain in the country today.

At the same time, patients from developed countries now visit poorer countries to obtain medical services at lower cost

On the other hand, as the medical industry is a global industry, patients from developed countries are frequently visiting poorer countries to obtain at lower cost medical services that they would otherwise have received at home. This is especially the case for cosmetic and elective medicine that might not be covered by the insurance policy or health system at home. Similarly, in order to reduce their living costs—including medical and, in the case of a chronic illness, nursing costs—and perhaps in order to enjoy a healthier climate, richer older persons often choose to relocate to a poorer country. It could be the case that this extra demand for the medical services of poorer countries will help them to retain medical and nursing staff and to expand coverage to the overall population.

In general, however, developing countries, particularly low-income ones, tend to spend a much lower share of their national income on health care (see table VI.2). For example, per capita health expenditure in sub-Saharan Africa is over 50 times less than the average of such expenditure in the developed world.[5]

In developing countries, most people pay directly from their own pocket for health care

The disparity in health-care services between rich and poor countries becomes even clearer when sources of health spending are examined (see table VI.3). Notably, the public share of total health spending tends to increase with per capita income, implying that individuals in developing countries are more likely to obtain health care through private schemes. In practice, most people pay for such services directly out of their own pocket, given the low coverage of private health insurance schemes in developing countries. What is more, the poorer the country, the larger the share of out-of-pocket expenses is likely to be. In 2003, the share of public spending in total health expenditures was 29 per cent in the low-income countries group, as defined by the World Bank, 44 per cent in lower middle income countries, and 58 per cent in upper middle income countries. In particular, the share of public spending in total health expenditure in South Asia as a whole in 2003 was 26.3 per cent, the lowest among the regions. Also within

5 The difference is calculated using market exchange rates to convert costs to United States dollars; when purchasing power parity dollars are used, per capita health expenditure in sub-Saharan Africa is about 33 times less (see World Bank (2006b), table A1.1).

Table VI.2.
Total health expenditure, by region, 2000-2003

	Health expenditure as percentage of GDP				Health expenditure per capita (current United States dollars)			
	2000	2001	2002	2003	2000	2001	2002	2003
Developed countries	10.3	10.8	11.2	11.3	2 705	2 806	3 019	3 415
Developing country regions								
Africa	5.4	5.5	5.6	5.6	41	43	48	54
South and East Asia	4.3	4.5	4.6	4.6	38	38	38	43
Western Asia	6.3	6.9	6.6	6.6	257	242	251	288
Latin America and the Caribbean	6.9	7.0	6.6	6.6	268	260	215	221
Economies in transition	5.7	5.7	5.9	5.8	76	87	102	124

Source: UN/DESA, based on World Bank, World Development Indicators Online, available from www.worldbank.org/data/onlinedatabases/onlinedatabases.html.

Table VI.3.
Share of public spending in total health expenditures, by region, 2000-2003

Percentage				
	2000	2001	2002	2003
Developed countries	59.8	59.6	59.4	60.0
(excluding United States)	76.6	76.9	76.7	76.5
Developing country regions				
Africa	44.3	44.3	43.4	42.8
South and East Asia	37.9	38.0	37.4	38.3
Western Asia	63.0	65.3	65.7	67.3
Latin America and the Caribbean	48.5	47.7	47.9	48.3
Economies in transition	58.9	60.4	60.8	61.3
Memorandum items:[a]				
Low-income countries	27.1[b]	25.0	27.8	29.1
Lower middle income countries	49.4[b]	46.6	45.5	43.7
Upper middle income countries	54.2[b]	57.8	57.6	57.9

Source: World Development Indicators Online.

a Country groupings as defined by the World Bank.
b Based on the latest data available before 2000.

developing countries, it mostly holds that poorer people have a higher share of out-of-pocket expenses on health care than richer households (see World Bank, 2006b). The lower public share of total health spending not only implies a heavier financial burden at the personal level, but also reflects the relatively lower revenue-raising capacity of poor countries and the lower level of the Government's health interventions to mitigate market failures in health-care and health insurance markets (see Schieber and Maeda, 1999).

Ageing and the need for reform of health-care systems

To meet the changes in health demands emanating from the unprecedented trend in population ageing, major adjustments will have to be made in every dimension of a health-care system. There will be important changes in the type of health-care services that are demanded, and in the required coverage of health insurance schemes, as well as in the direction of research agendas. The enhanced prevalence of chronic diseases and needs for long-term care will likely also have implications for the living arrangements of older persons and the relatives engaged in caring for them.

The case of the United States demonstrates that the relationship between ageing and health expenditure is not clear-cut

The fact that in developed countries population ageing has been accompanied by substantial increases in medical expenditures has led to the widely held perception that it is population ageing in particular that is driving up health costs and that these costs may become unsustainable. This perception is based on the following simple reasoning: Since older persons have a higher risk of being affected by disease and thus of requiring more medical attention than younger people, an increase in their share of the total population would be expected to drive up medical expenditures. Even though the United States lacks universal health coverage, unlike most other developed countries, health-care expenditure per capita (inflation-adjusted) has consistently outgrown gross national product (GNP) per capita since 1929, pushing that country's share in GNP from 3.5 per cent (Newhouse, 1992, table 1) to about 15 per cent at present. The trends have been similar in other countries that are members of the Organization for Economic Cooperation and Development (OECD), although none has so far reached the level of health-care expenditure as a share of GNP or of health-care expenditure per capita attained by the United States. The question, however, is to what extent ageing has been a factor in these rising health costs. The answer to this question as supplied by the experience of the developed countries can help point the way for developing countries.

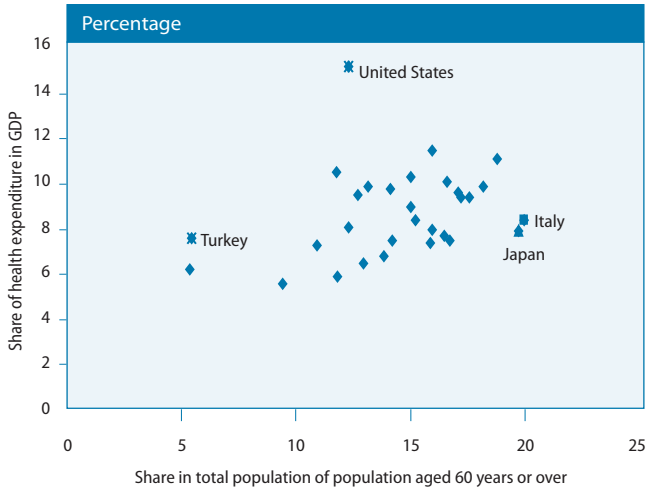
Some studies show that the relationship between population ageing and health expenditure is not as close as it is perceived to be. Based on age differentials in spending on health care, the demographic change in the United States for the period 1940-1990 can explain a mere 15 per cent of the total increase (Lloyd-Sherlock, 2000). Similarly, changes in demographic structure over the period from 1985-1987 to 1996-1999 were also estimated to be responsible for 6 per cent of the observed increases in health-care expenditure in Australia and for 14 per cent in Canada (Gray, 2005). Apparently, non-demographic factors explain most of the rise in health expenditures in these countries. In contrast, over the same period, the comparable figure for Japan was 56 per cent. The demographic structure of the country is becoming older at a faster pace than that of other developed countries, making population ageing a larger factor in explaining observed increases in health expenditures.

Cross-country comparisons also indicate significant disparities in health spending among OECD countries and show that population ageing is not the main explanation thereof (see figure VI.3A). While Turkey and, to a lesser extent, the United Kingdom have a younger age structure than that of Italy and Japan, the four countries spend similar shares of GDP on health care. Germany, in turn, has a share of older persons in the population similar to that of Japan and Italy but spends about 3 percentage points more of GDP on health care. Among the developed countries, the United States has a relatively young population but its health spending exceeds by far that of any other country. Also when looking at changes over time, no close correlation can be observed among developed countries between population ageing and health-care spending (see figure VI.3B and C).

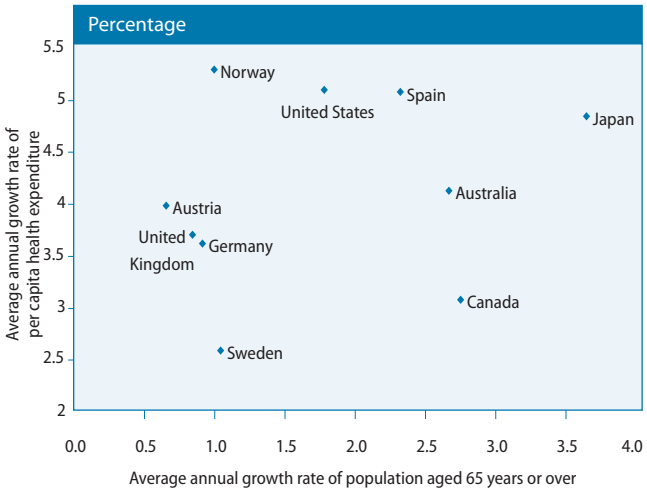
A study on health expenditures for the period 1951-2000 in New Zealand (Bryant and Sonerson, 2006), points out two non-demographic mechanisms at work in affecting health

Figure VI.3

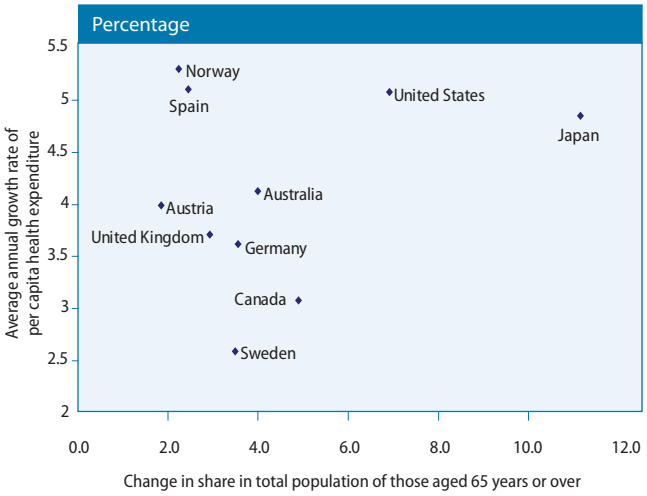
A. **Share of older persons in total population versus share of health expenditure in GDP, selected OECD countries, 2003**



B. **Average annual growth rate of older population versus average annual growth rate of per capita health expenditure, selected developed countries, 1970-2002**



C. **Change in share in total population of older population versus average annual growth rate of per capita health expenditure, selected developed countries, 1970-2002**



Source: UN/DESA, based on World Development Indicators Online.

expenditure: the level of general revenues of the Government and pressure from the salaries and wages of health workers. The demographic structure of the country has become steadily older since 1950 while health expenditures have experienced large fluctuations. The study shows that it was government revenues and salaries and wages of health workers, rather than demographic changes, that moved with health expenditures.

Technological progress and changes in health policy have been major cost-drivers

Technological progress (new scientific discoveries and new drugs and treatment) and changes in health policy have been other major drivers of health expenditures. Public and private health insurance schemes responded, in terms of the type and extent of coverage, to people's greater desire to use new health-care services, as incomes rose and technological advances were achieved; and technological advances have transformed the health-care system, including the intensity and coverage of health services. At the same time, the interaction among technology

advance, policy change and demand for better health have often induced inflation of health-care services. A measure of technological advance is the fact that the majority of diagnostic capabilities, medical procedures, equipment and pharmaceuticals used today were developed in the past 50 years and can effectively deal with diseases that were not curable in the past.

Technological progress and health policy are closely related (Weisbrod, 1991). The pace and types of medical and pharmaceutical research and development are functions of expected monetary rewards for the pharmaceutical industry. These potential rewards are determined partly by the prevalence of diseases for which a cure or treatment is being sought, and partly by the possibility of reimbursement for research and development and product development which depends in turn on the comprehensiveness of public and private health insurance coverage and its accessibility by the general public. At the same time, the emergence of new technologies and medicine tends to place upward pressure on prices of health-care services and on the need for public or private health insurance. In other words, medical technologies and health-care expenditures are at least partly determined independent of population ageing.

While not the main driver of health costs, population ageing is expected to change the composition of overall health expenditures

The analysis thus far suggests that population ageing is not the dominant factor in rising health costs. This does not imply, however, that health costs will remain low and that their distribution over different age groups will remain stable in coming decades in developing countries. Population ageing will change the composition of overall health expenditures, as older persons—high-cost medical users—constitute a larger share of the population. Furthermore, rising income levels and increasing awareness by the public of the availability and effectiveness of new medical technologies and medicine will create greater demands for health-care services, irrespective of population ageing.

Table VI.4 demonstrates the extent to which older persons' expenditure on health care is different from that of younger persons by presenting information on per capita health expenditures in several age groups for selected countries.

Relative health spending differs strongly by age group in these selected countries. In general, though, health spending directed at meeting the needs of older persons tends to be higher. This is very pronounced for Canada, for example, although it also tends to be the case for other OECD countries.[6] In Canada, health expenditures are especially high for very old persons (aged 85 years or over). Similarly, in developing countries, the cost of health care for older persons seems to be relatively higher than for other age cohorts. This has been observed, for instance, in Brazil and the State of Punjab in India. In other countries and other States in India, however, per capita relative health expenditures on older persons are significantly lower than in Canada.

The different spending patterns reflect the types of health-care services provided at the end of life in developing and developed countries. While there has been little research on health-care services at end of life in developing countries, it is still possible to make some inferences based on demographic and sociological circumstances. In developing countries, a far smaller proportion of those over age 60 live alone than in the developed countries (about 7 per cent as against 25 per cent), although in both regions this proportion has tended to increase over time. Those living alone tend to have significantly lower levels of well-being than people who live with others and in the poorest countries, older persons living alone tend to constitute an especially disadvantaged group. Surprisingly, perhaps, once controls for other variable have been put in place, the effects of urban or rural residence on older persons' living arrangements are not significant. In the developed countries, those living alone face an elevated likelihood of entry into long-term institutional care and this is especially the case for those who have no children, siblings or relatives who can be the main providers of informal support (United Nations, 2005b).

6 These data are not shown in the table but see, for instance, Organization for Economic Cooperation and Development (2006b, figure 2.1).

Table VI.4.
Distribution of total health-care expenditure, by age group, selected countries[a]

Brazil															
Age group	Average	0-4		5-44		45-54	55-64		65-74		75+				
Public expenditures[b]	100.0	165.7		55.2		129.0	193.1		292.0		415.5				
Canada															
Age group	Average	0-14	15-24	25-34	35-44	45-54	55-64		65-74		75-84	85+			
Total expenditures	100.0	45.3	59.0	59.4	61.1	79.0	114.1		208.7		394.9	854.9			
China															
Age group	Average	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	64+
Total expenditures[c]	100.0	35.0	17.9	11.8	51.4	12.6	7.2	8.6	146.8	127.6	89.9	104.9	323.9	212.1	250.4
Egypt															
Age group	Average	0-4	5-15	16-29	30-39	40-49	50-59	60-69		70-98					
Total expenditures	100.0	73.0	61.6	78.1	123.5	167.5	203.7	209.1		177.7					
India															
Age group	Average	0-59						60+							
Andhra Pradesh – Total expenditures	100.0	97.3						138.1							
Karnataka – Total expenditures	100.0	89.7						237.7							
Punjab – Total expenditures	100.0	89.9						374.0							
Sri Lanka															
Age group	Average	0-14			15-59			60-74		75+					
Total expenditures	100.0	96.7			90.9			163.2		184.2					
Uruguay[d]															
Age group	Average	0-14			15-44	45-64			65-69	70-74	75-79	80+			
Total expenditures	100.0	54.0			72.5	117.6			150.4	154.3	158.1	154.3			

Source: UN/DESA, based on national sources.

a Index: average total health expenditure per capita for all age groups, set at 100.
b At hospitals only, not including birth-related health expenditures.
c Curative treatments only.
d Based on costs of hospital stays borne by the Uruguayan health-care organization Centro de Asistencia del Sindicato Medico del Uruguay (CASMU).

In Canada, the use of high-tech medical treatments and new drugs is a reason for high expenditures on older persons

In Canada, the major portion of the health expenditures on those aged 85 years or over (about 75 per cent) is related to the costs of long stays in residential care facilities (for example, nursing homes) and the use of beds for palliative care in hospitals providing long-term care. Out of a total per capita health expenditure of Can$ 27,135 per year for those aged 85 years or over in 2000-2001, $10,401 was allocated to hospital care and $9,358 to long-term care provided by other institutions.[7] The high costs of health care are partly a result of the use of high-tech medical treatments and new drugs when the health status of a person deteriorates over an extended period of time owing to chronic illness (Mathiason, 2003).

Over the long run, however, medical advances may help contain costs

However, over time, medical advances can help to contain costs. In Canada, the total health expenditures consumed by those aged 65 years or over had increased by 22 per cent between 1980-1981 and 2000-2001, during which period the population in this age group grew by 33 per cent. The replacement of surgical procedures with drug therapy, wider use of one-day surgery, reductions in the duration of hospital stays and the greater use of community and home-care services made it possible for the Government to decelerate the escalation of health costs during the mid-1990s (Health Policy and Communications Branch, Health Canada, 2001).

It should be noted that a person's "calendar age" is not necessarily a reliable indicator of health expenditures; instead, what determines in part the level of health needs and expenditures per person is proximity to death or (expected) remaining lifetime, according to various medical analyses conducted in several developed countries (Gray, 2005). This is largely because much of lifetime health-care expenditure is incurred during the last year of life regardless of a person's calendar age; in many cases, the patient stays, before dying, in high-cost facilities for a lengthy period of time. The concentration of medical expenditures at the end of life, independent of calendar age, is evident in some categories such as heart disease and cancer.

The experience of Medicare in the United States has been that medical expenditures in the last year of life *decrease* with age, particularly for those aged 85 years or over.[8] The pattern was found in different geographical areas (California and Massachusetts), for both sexes, for different races, irrespective of degree of co-morbidity, in hospices and hospitals, and regardless of cause or site of death. Moreover, the intensity of medical care in the last year of life decreases with increasing age:[9] expenditures for hospital services decline, with reduced intensity of care of the older groups during hospitalization. Recently, similar patterns were observed in two out of the three States investigated in India, namely, Karnataka and Punjab (see Mahal and Berman, 2006).

The relationship between ageing and health expenditure is weaker than is often thought

In summary, the evidence indicates that there does exist a relationship between ageing and health expenditures, but one that is weaker than is often thought. The pattern of end-of-life medical expenditures in many developing countries seems to differ from that in developed countries, owing to the lack of access to nursing and palliative care, and the lower intensity of medical interventions. As a result, the end of life may come with more suffering, but also more quickly. Low public-health coverage and relatively high out-of-pocket spending in many developing countries are likely to put such services as might prolong life in the developed countries out of reach of the majority of people in developing countries (Rannan-Eliya, Vidal and Nandakumar, 1998).

7 The rest was spent on pharmaceuticals and health-care supplies.

8 See, for example, Levinsky and others (2001).

9 This is based on intensive care unit admission and the use of ventilators and pulmonary artery monitors and of cardiac catheterization and dialysis.

The challenge for health policies

Improvements in health conditions do not depend solely upon the delivery of health or medical services. They are also the result of such factors as improvements in nutrition from the earliest ages, and improvements in education and sanitation, the amount of exercise being undertaken and reduction of tobacco and alcohol consumption, and of the risks of contracting infectious diseases, including HIV/AIDS. At the Second World Assembly on Ageing held in Madrid in April 2002, WHO launched its life course approach to healthy ageing, which recommended that Governments address those factors that contributed to the onset of disease and disabilities (World Health Organization, 2002e). These factors will help determine the course—and costs—of the epidemiological transition.

Developing countries may face different epidemiological transition scenarios

Two different transition scenarios are usually considered: one is referred to as the conventional wisdom or "the failures of success", and the other as "the compression of morbidity".[10] Depending on which course prevails in the future, policymakers will face different sets of challenges.

The first scenario is pessimistic and depicts the extension of life as accompanied by an extension of the period of chronic illness

The first scenario projects an extended period of life spent in a state of chronic illness, such as heart disease, stroke or dementia, or with one or more functional disabilities. Each of these sets of factors will require large shifts in health-care inputs and the acquisition by health-care workers of new skills. The country will have an ever-larger number of fragile persons and incur substantial increases in health expenditures, associated with new technologies and the need for new medical infrastructures. Care for older persons would be expanded as well. The increased expenses will have to be borne by private individuals and Governments. Healthy members of the society—young and old alike—will be required to make greater contributions. Insurance schemes and the securing of adequate public and private financing through tax increases in general and private financing supported by tax breaks for families caring for older persons, will be needed, entailing a wholesale rebuilding of the existing national health-care system. Because of this very success in achieving greater longevity, pressure on the health system becomes greater. Hence, the failures of success (Gnanasekaran, 2006).

The second scenario, depicts the extended period of life as accompanied by a shortening of the period of illness

The second scenario paints a brighter picture, in which increases in the age of onset of chronic disease or disability are greater than increases in life expectancy, and morbidity is thereby compressed into the very late stage of the life of individuals. For this to happen, the Government, communities, families and individuals—young and old—are required to take conscious and concerted actions, including various measures promoting health and healthier lifestyles at younger ages through proper nutrition, non-smoking, moderate alcohol consumption, regular exercise and education—the very factors that WHO is promoting for healthy ageing.

The health policy implications to be drawn from the two scenarios are not mutually exclusive. For many developing countries, providing care for acute episodic conditions or preventing infectious diseases are health policy priorities; at the same time, health education and promoting a healthier lifestyle can be seen as constituting a long-term health policy goal. Health policy derived from the first scenario, on the other hand, entails a warning to many Governments and the international community at large that, without a significant expansion and improvement of the existing health-care systems, developing countries will face large increases in health expenditures when they are still relatively poor.

No matter which scenario becomes a reality, more geriatric and gerontology specialists and health workers will be needed

As the relative importance of communicable diseases decreases and that of non-communicable diseases and disabilities increases, a larger pool of geriatric and gerontology specialists and health workers will be required. Because older persons tend to develop multiple medical conditions (co-morbidity), their symptoms are often different from those of younger persons.

10 The analysis here is largely based on Fries (2005) and Gnanasekaran (2006).

At the same time, the expansion of hospital facilities and beds and the introduction of modern innovations are necessary not only for an ageing population, but also for the improvement of the health of the general population which faces severe shortages of necessary medical treatment.

It is not unimaginable that an increase in disabled persons may also have a negative impact on the quality of life of "caregivers" who often provide unpaid care. Even in those countries where the Government has established formal arrangements for dependency care, the family and community are the main providers for older persons. However, when, as has historically been the case, the demographic transition is taking place in a period of accelerated economic growth, the combination can also induce unexpected changes in social values as they relate to care of aged parents and community members.

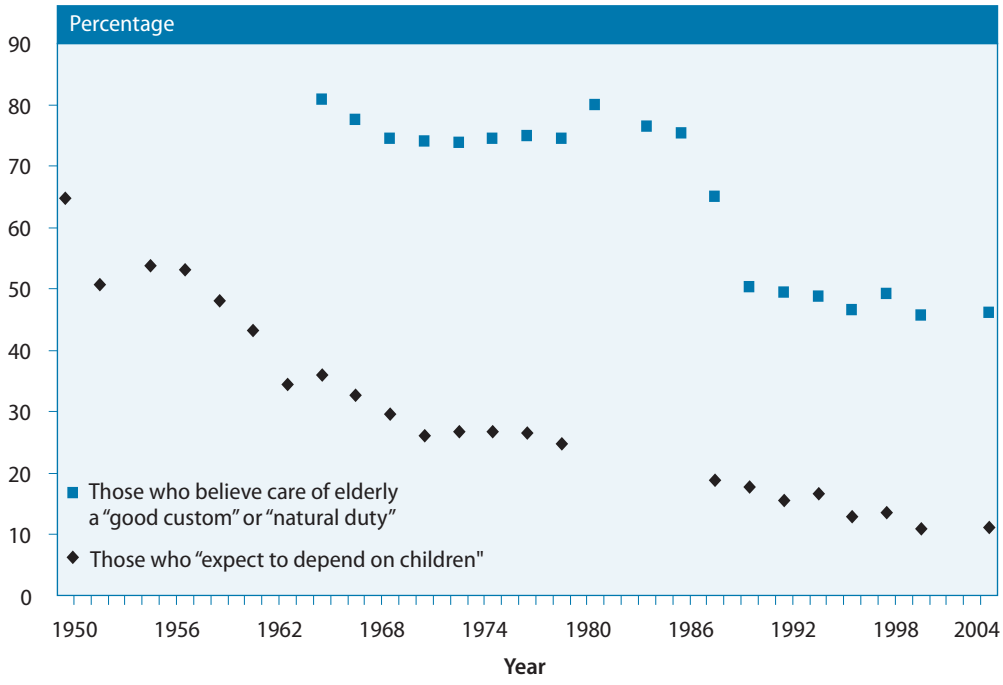
Attitudes of family members towards caring for their parents can suddenly change

For instance, a study on health care in Japan (Ogawa and others, 2006) showed a sudden shift in attitudes towards caring for elderly parents. In a series of nationwide surveys concerning family planning conducted since 1950, a dramatic decline was observed between 1986 and 1988—a period of two years—in the proportion of married female respondents under age 50 who believed that providing care for old-age parents was either a good custom or a child's natural duty (see figure VI.4). This drop has been part of an ongoing declining trend in perceived willingness to care for elderly parents; but according to the study, the indicated sudden decline in 1986-1988 "corresponds to the period when the government shifted more of the burden of care for the elderly from the state to families", to which "the middle-aged women responded negatively" (ibid., p. 16).

Ongoing socio-economic changes will make it more difficult to maintain the current forms of traditional long-term care

The traditional family structure and the role of women are thus changing or will change, sometimes drastically. It will become more difficult for many countries to maintain the current forms of traditional arrangements for long-term care. As will be discussed later, every society needs to introduce a formal system that may serve as a complement to, but not a substitute for, the traditional arrangements.

Figure VI.4.
Trends in norms and expectations with respect to care for the elderly among married females under age 50, Japan, 1950-2004[a]



Source: Ogawa and others (2006).

a As determined by a series of nationwide surveys.

The provision of long-term care

There is universal concern over how to provide long-term care for those whose health condition is irreversible. While most older persons remain active and relatively healthy, it is foreseen that there will be an increase in the need for long-term care, particularly for "persons needing help in daily living" (World Health Organization, 2002b)—a need to which every society should be able to respond in a manner that accords with its own traditions and the best interests of those needing such care.

In general, the growing concern reflects two trends, namely, the increase in the prevalence of long-term disability in the population and the change in the capacity of the institutional and informal systems to provide support (World Health Organization, 2002d). The rate of increase in the number of persons needing help in daily living and the rate of change of the institutional and informal capacity shape the framework of a nation's system of long-term care as a whole.

Developed countries are attempting to provide a continuum of different types and levels of services, putting greater emphasis on home-care services

In developed countries, long-term care needs mainly results from population ageing, although the level and mix of services differ among them. On the whole, they are attempting to include home-based care service as part of a *continuum* of different types and levels of care, as called for by the Madrid International Plan of Action on Ageing (United Nations, 2002a). Many of these countries are thinking of ways to put greater emphasis on bringing home-care services to the appropriate level and to support and build the skills of family caregivers. Home-based health care is being encouraged through the provision of several financial incentives and various health-care and welfare services (see box VI.1).

In developing countries, however, population ageing is but one of the factors underlying the need for long-term care. Infectious diseases and injuries caused by armed conflicts and traffic accidents, which affect all age cohorts, also require such care. Demand for long-term care resulting from ageing is strongly increasing with the speed of the demographic transition in these countries. The focus of the remainder of the present section will be on the provision of long-term care to older persons.

In developing countries, family or networks of relatives and neighbours are the major sources of support and care

In many developing countries, institutionalized forms of long-term care services tend to be in poor supply. The extended family and networks of relatives, friends and neighbours remain the major sources of support and care. Even in cases where some forms of formal support are available, the health authorities often mainly concentrate on family guidance, counselling and education about health care. The care itself is then provided at home by family members.[11] Yet the declining importance of the extended family in many developing countries, as discussed in chapter III, is making it more and more difficult to rely exclusively on this form of informal care.

It is difficult, however, to draw an aggregate sketch of the coverage of long-term care because of widely differing country situations. Moreover, because the long-term care services are often provided not only to older persons, but also to the poor and the disabled within a single institutional or informal support system, separating the two components is not possible in many cases.[12] To achieve a better understanding of existing realities and to learn from what already existed in developing and transition countries in terms of care services available also for older persons, WHO (2002b; 2002c; 2002d) chose a case-study approach to the subject.

11 "Home care for the chronically ill" under the Mexican Institute for Social Security, the main social security institute in the country, is an example of such a strategy (see World Health Organization, 2002d).

12 Under the Mexican Institute for Social Security, only 8 per cent of total users were persons aged 65 years or over (World Health Organization, 2002d).

Box VI.1

The "ageing in place" movement: the growing importance of home-based health care

Family caregiving and programmes for older persons have recently received much policy-related attention in many countries, owing to the recognition that most families around the world continue to provide some care in spite of changing living patterns. The "ageing in place" movement, designed to help older people stay at the family home or in a home-like environment, emphasizes the need for programmes that support family caregivers to help achieve this objective. In developed countries where formal care is in place, there is a growing emphasis on making it complementary to, rather than a substitute for, informal care.

In some developed countries, there has been a rapid expansion of policies and programmes designed to support family caregivers. In Sweden, for example, municipal governments give priority attention to caregiver support policies and programmes (Herlitz, 1997; Sundstrom, 1994). These policies and programmes can be classified within three major categories: job support, financial support, and social services. Job support policies are designed to help working caregivers. They include a caregiver insurance programme which provides paid leave when a worker cannot report to work because of caregiving responsibilities, a family leave policy which guarantees job security without pay, and employment-based eldercare, which allows flexible work schedules and includes provision of counselling and referral services, adult day care in or near the workplace and other employee assistance programmes.

Financial support policies encourage family caregivers to offer care at home. They take three forms: subsidies, salaries and tax credits. Subsidies that older persons receive from government can be used to pay family members who provide care for them at home. Salaries can also be paid by government directly to the family caregiver so that the person can afford to "work" at home full-time. Finally, tax credits or deductions to lower the tax burden can be given to family caregivers who may have to incur expenditures on items for home-based care.

Social services, which are designed to assist the caregiver and provide relief from caring, include housekeeping and home maintenance services and day-care and sitter services for older persons. More recently, Governments in Scandinavian countries have started offering services to caregivers, including counselling, caregiver support groups, and information and referral services. Training programmes are designed to prepare caregivers for both the practical tasks of caregiving and the physical and emotional stress associated with care at home. The combination of these policies and programmes offers a multidimensional framework of support for family members providing care (Hokenstad and Johansson, 1996).

Norway has historically placed more emphasis on a programme in which family members—usually daughters or daughters-in-law—are paid part-time salaries to provide home help services for an elderly and/or disabled relative. Some provide care for elders of other families and so become full-time home helpers. About 25 per cent of all home helpers in the country are relatives or neighbours of those for whom they provide care. From the perspective of the family, this programme provides additional income while allowing a family member to have a major caregiving role. This approach to government financial support of family caring is now being expanded to many countries as part of the "consumer choice" movement in eldercare. Consumer choice enables older people receiving long-term care in their homes to choose between receiving home care from government and private agencies and having family members subsidized to provide the care.

Caregivers in the developing world have less access to both economic and service support, but such programmes are growing. Social development programmes in a number of countries help provide a source of income for older women, many of whom have primary caregiving responsibilities. An example of this type of programme is the Samridhi day-care centre set up in rural India, which helps elderly women learn traditional crafts that can assist them in earning a living, thereby supplementing the family living. Samridhi also helps by providing the women with raw materials and the infrastructure needed to earn an income through craft-making.[a]

a Further information available from http://www.helpageindia.org/daycarecentres.php.

Publicly funded long-term care is not available in many parts of the developing world

The WHO case studies show that developed countries typically offer a broad package of long-term services.[13] In contrast, publicly funded long-term care is not available in the majority of the 10 countries that were examined by WHO (2002c).[14] Of these, only richer countries, such as the Republic of Korea, as well as Lithuania and Ukraine, offer a wider range of long-term care services.

More generally, the sample countries with higher per capita income levels tend to provide a mixture of home-based long-term care services for those needing help for daily living, irrespective of age, and institutional long-term care. The broader package of services offered in Lithuania and Ukraine includes institutional care, home health care,[15] personal care at home and homemaking. In these countries, personal care at home and homemaking services are targeted at the poor in all age cohorts and at older persons without families. Publicly funded personal care services are not available to the non-poor population in these countries, but home health care is offered based on health conditions and disability, irrespective of their income levels.

In Lithuania, in 1998, there were found to be 90 institutional care facilities, 29 of which were operated by non-governmental organizations, including the Red Cross Society and faith-based organizations. Until 1990, the country had focused its social programmes on institutional care for older persons and the physically and mentally disabled. Since then, however, the number and variety of public institutions has grown, non-governmental organizations have become more active in providing long-term care for both older and younger persons, and the development of "non-institutional" (also called "community-based") forms of care have gained in importance (World Health Organization, 2002d). These government and non-government organizations offer a variety of types of care for disabled persons, both young and old, including personal care (grooming, bathing and provision of meals); household assistance (cleaning, laundry and shopping); remodelling of the home to meet the needs of disabled persons; provision of supplies, assistive devices, equipment and medicine; palliative care; and provision of information and guidance to the patient's family.

Non-governmental organizations in Lithuania were taking care of about 14 per cent of the total number of residents living in institutions in 1998, representing a doubling of the proportion in 1995. Health-care workers under the community-based form of programmes provide home-care nursing, but also other services such as shopping and housekeeping as mentioned above. In 1997, more than 2,200 workers and volunteers had been involved in care delivery, but WHO concluded that this number was insufficient to meet the current level of needs and also cautioned that the same conclusion applied to funding.

In most developing countries, long-term care services are limited

The other countries studied provide smaller ranges of care services for older persons. Yet, even if these services are available, the number of people covered is relatively small. In Thailand, for example, the Department of Public Welfare provides services for older persons, particularly those who are socially isolated and vulnerable, that include prevention of homelessness, abuse and family neglect through, inter alia, residential care, the creation of service centres, the dispatch of mobile units and the provision of emergency shelters. The private sector and non-governmental organizations also have programmes designed for older persons, including the provision of a monthly subsistence allowance and service centres located in temples. The number of older persons covered by such public and private programmes is not known. Given that the number of older persons in public institutions throughout the nation that provide for disabled residents who have been abandoned or neglected was 2,807 in 2000, it can be seen that the provision of public services is not yet satisfactory (World Health Organization, 2002d).

13 The countries examined were Austria, Canada, Germany, Israel, Italy, Japan, the Netherlands, Sweden and the United States (see World Health Organization, 2000; and Brodsky and others, 2002).

14 The countries examined were China, Costa Rica, Indonesia, Lebanon, Lithuania, Mexico, the Republic of Korea, Sri Lanka, Thailand and Ukraine.

15 Home health care refers to situations where doctors or nurses visit patients at home.

Many countries envisage taking measures to develop formal community health care. This approach seems compatible with the development of home-based long-term care. As noted previously, Lithuania and Ukraine, where long-term care has been institutionalized, are now making community-based care part of their formal health-care system. The Republic of Korea, where the formal system is still in its infancy, also emphasizes the importance of creating formal long-term care within the framework of community-based care in order to lower the rates of utilization by patients of more expensive hospital services.

The first and foremost challenge in home and long-term care for countries where large numbers of the populations are living in poverty, such as Cambodia, Haiti, Kenya, South Africa and Uganda, compared with the relatively rich countries considered above, is to provide, next to medical services, an adequate supply of food, decent housing, safe water and waste disposal, affordable soap and other basic supplies and medicines.

Older persons are also caregivers to their children and grandchildren

Meanwhile, the role of older persons in caregiving, to their children, grandchildren and to the community at large, should be stressed; and as called for in the Madrid International Plan of Action, provisions should be made to assist older persons in their caregiving role. This has been especially important in families where the parents of children have been lost to HIV/AIDS and other diseases and grandparents are providing support. In more general terms, it would appear that the ageing of the population will be accompanied by the growth in the number of healthy older persons who will be willing and able to serve as professional caregivers or volunteers. In this respect, the importance of non-governmental organizations and volunteers in the delivery of long-term care has been recognized in many countries including China, Indonesia, Sri Lanka and Ukraine.

Efforts to sustain the home-based care system may encounter difficulties because of changes in family structures and in the role of women

Those countries that attempt to maintain their existing home-based, informal care system could encounter difficulties in the future, largely because the traditional family structure and the role of women are changing, sometimes faster than anticipated, as examined in chapter III.

The case of Mexico illustrates how the traditional system of provision of home care by a family member, usually the daughter who works at home, is tending to break down (World Health Organization, 2002c). Over the past few decades, the country experienced an improvement in its educational performance, with higher enrolment ratios and higher average number of school years attended, and an increase in labour participation rates among working age groups. The economic crises that hit the country during this period may also have contributed to higher labour-force participation, with women, youth and children entering the labour market. This reduced the time that family members had available to care for young children, older persons and the sick (Knaul and others, 2002). Generally, long-term factors are making traditional care arrangements more difficult, including the increase in female labour-force participation, often associated with migration, and the greater importance of the nuclear household in urban areas. Some of these factors have been observed in other countries, such as China, where the massive migration of individuals from rural to urban areas has left behind older persons and disabled relatives for whom the migrants were formerly expected to care (Hua and Di, 2002).

Unfortunately, the extent of the provision by the State of alternative means of support, such as through social security institutions, has been insufficient to offset the effect of the diminishing role of the extended family. In the case of Mexico, for instance, about 45 per cent of the population over age 65, as well as many who suffer from a disability or a chronic disease, have no access to social security benefits. Moreover, the financial deficit of the social security system limits the level of the social benefits that can be paid out to those who are covered.

Data on disability rates and morbidity are limited in many developing countries and thus the future need for long-term care services is difficult to predict. Moreover, studies on long-term care systems—both institutional and informal—are in their infancy. Even where such studies exist, the impacts of various long-term care measures on the welfare of older persons are not yet clearly understood. There is thus an urgent need for more studies on long-term care in developing countries which could facilitate a better-informed dialogue within and among countries.

There is an urgent need for more studies on long-term care in developing countries

Implications for future health costs

The above analysis was necessary to place in context attempts to calculate the future public-health costs of an ageing population. Many of the private and public actions aimed at improving overall health involve expenditure and lifestyle choices by individuals—factors that are not included in existing future health cost projections but they could play a major role in determining levels of health expenditure.

The expected rise in expenditure on health and long-term care, while not necessarily a result of ageing per se, will put pressure on the national economy and government budgets in many developing countries, particularly if economic growth does not turn out to be as robust as expected. Pressing questions concern how much health and long-term care expenditure could grow as a result of the various factors examined previously and how such increases could be contained if the financial burden on the national economy and the government budget is forecast to be too great.

Projections of the impact of ageing on health expenditures

Projections of the impact of population ageing on future health-care costs are mostly available only for developed countries, owing not only to greater policy interest in the issue, but also to the wider availability of data. Developing countries, in general, have only limited health data, making it more difficult for researchers to make such projections for those countries.

Actuarial and epidemiological approaches have been developed to project future health expenditure depending on the research objectives and policy/planning goals (see box VI.2). As demonstrated above, the relationship between population ageing and health expenditures displays a complex pattern and understanding it requires identifying all the factors that influence health expenditures and building a framework that can capture the complexity of the underlying dynamics.

Actuarial and epidemiological approaches have been applied to project future health costs

In an actuarial framework, future expenditure requirements are calculated based on the existing age and sex profile of expenditure. Projected population changes and changes in projected per capita costs, which are often extrapolated from observed trends, can then produce estimates of future health expenditures. Implicitly, the projected per capita costs are assumed to include all growth factors and can be seen to constitute the composite effect of the non-demographic factors discussed above. A study on Sri Lanka (Rannan-Eliya, 2007) offers an insightful application of the actuarial framework for a developing country.

The case of Sri Lanka

The health and demographic characteristics of Sri Lanka are in many respects similar to those of a developed country

Although Sri Lanka is a low-income country, it has relatively good coverage of social services, which is also reflected in a relatively good performance in terms of human development indicators. The adult literacy rate is over 90 per cent and life expectancy at birth was 68.7 years for men and 76.8

Box VI.2

Projecting health-care expenditures into the future[a]

[a] Based on Rannan-Eliya and Wijesinghe (2006) and Mahal and Berman (2001).

Growth in health expenditures since the last quarter of the twentieth century and, more recently, increasing awareness of the potential impacts of population ageing on fiscal balance and on national economic vitality have ignited considerable interest among policymakers and the general public in the possible future health "burden". Projecting health-care expenditures into the future is a useful tool in helping policymakers understand key factors that would influence expenditures and placing population ageing in a wider perspective. Among available projection methods, the actuarial and epidemiological approaches stand out.

In the actuarial methods, the population is divided into several age-sex groups. Aggregate personal health expenditures (that is to say, those for health services delivered to individuals) are calculated as the sum of the products of the number of people in each age-sex group and the average expenditure for health care per capita used by persons in the same group. Persons in older age groups are likely to use health-care services more often than their younger counterparts (although not necessarily) and when they use them, they are likely to require more resources. Similarly, older women are likely to use health services more than their male contemporaries. Population ageing, by this construction, leads to higher aggregate health expenditures. The per capita average health expenditure in each age group can further be decomposed into the age-sex-specific use of medical services per capita (the utilization component) and the unit costs or price of delivering medical services or pharmaceuticals (the price component). Public expenditures on preventive and collective health, administrative costs and capital expenditures are added to the aggregate costs of services delivered to individuals.

The epidemiological methods, as the name indicates, are based on epidemiological trends. Utilization of and expenditure for health services are linked to specific diseases or morbidity conditions. Aggregate health expenditures are calculated as the sum of the products of the number of persons in each age-sex group, the incidence of disease or morbidity in each group, the average volume of health-care services per capita used by persons in the group with a specific disease or morbidity condition, and the average price of the services. To undertake projections, the diseases or morbidity patterns have to be predicted based on current trends, and future expenditures per person in a specific age-sex group with a particular disease or morbidity condition must be estimated. The major difference between this and the actuarial approach is the inclusion of the prevalences of diseases or morbidities as cost-drivers.

The epidemiological method has the ability to project the incidence of diseases or morbidities and their associated expenditures. By knowing what types of diseases or morbidities are to prevail in the future, the health authorities will be able to arrange necessary health facilities and services in advance (treatments and necessary facilities for patients with dementia or diabetes, for example, are different from those for patients with ischaemic heart disease). Public campaigns for a healthy lifestyle—one that includes non-smoking, diet and moderate consumption of alcohol—can be cost-effective tools with which to reduce future costs if the incidence of such non-communicable diseases is projected to grow considerably. Information requirements for undertaking such an epidemiological approach are greater, however, than for an actuarial one, thus making the former a more difficult and expensive undertaking for developing countries. While the actuarial approach in its calculations of per capita health spending is more likely to capture all the major cost elements, it is silent about the linkage between diseases/morbidity and age-sex-specific health costs. Because of the lesser information requirement, this approach has been more widely applied in both developed and developing countries.

years for women according to the standard projection in 2002-2006. The fertility rate in Sri Lanka is around replacement level, varying from 1.86 according to the low projection to 2.1 according to the high projection for 2002-2006. The country has an extensive network of health institutions, and it is estimated that no one has to travel further than 1.4 kilometres to reach a fixed health facil-

ity (Abeykoon, 2002). Sri Lanka thus shares many of the demographic and epidemiological characteristics of a developed country. Total expenditure on health in 2005 was 4.2 per cent of GDP and was split between the private sector (2.0 per cent of GDP) and the public sector (2.2 per cent).

The proportion of the total population over age 65 is projected to increase from 6.3 per cent in 2001 to between 23.5 and 29.7 per cent in 2101, by which time life expectancy is expected to have increased by about nine years. Because the available data for Sri Lanka indicate that morbidity compression is not taking place, the Sri Lankan study assumes that there would be no change in the age-sex-specific health status of the Sri Lankan population in future decades. This would put an upward bias in the projections if, in fact, the compression of morbidity does take place.

Health-seeking behaviour is one factor of importance in determining future health expenditure. Such behaviour refers to cases where individuals begin to visit the doctor or health facilities more often than before. The rate of outpatient visits is already relatively high in Sri Lanka (5.2 per capita per annum in 2005), and according to the different assumptions, this figure could increase slowly to 8.4 visits per capita per annum in 2101 or more rapidly to 13.5 visits in 2101 (compared with, for instance, 16 per capita per annum in Japan between 1993 and 1996). Little change is foreseen in the inpatient utilization rates over the period. In addition to the behavioural changes, productivity and price inflation are also expected to affect future expenditures on health-care services.[16]

The results under three different scenarios show that ageing is an important driver of increasing health costs in Sri Lanka …

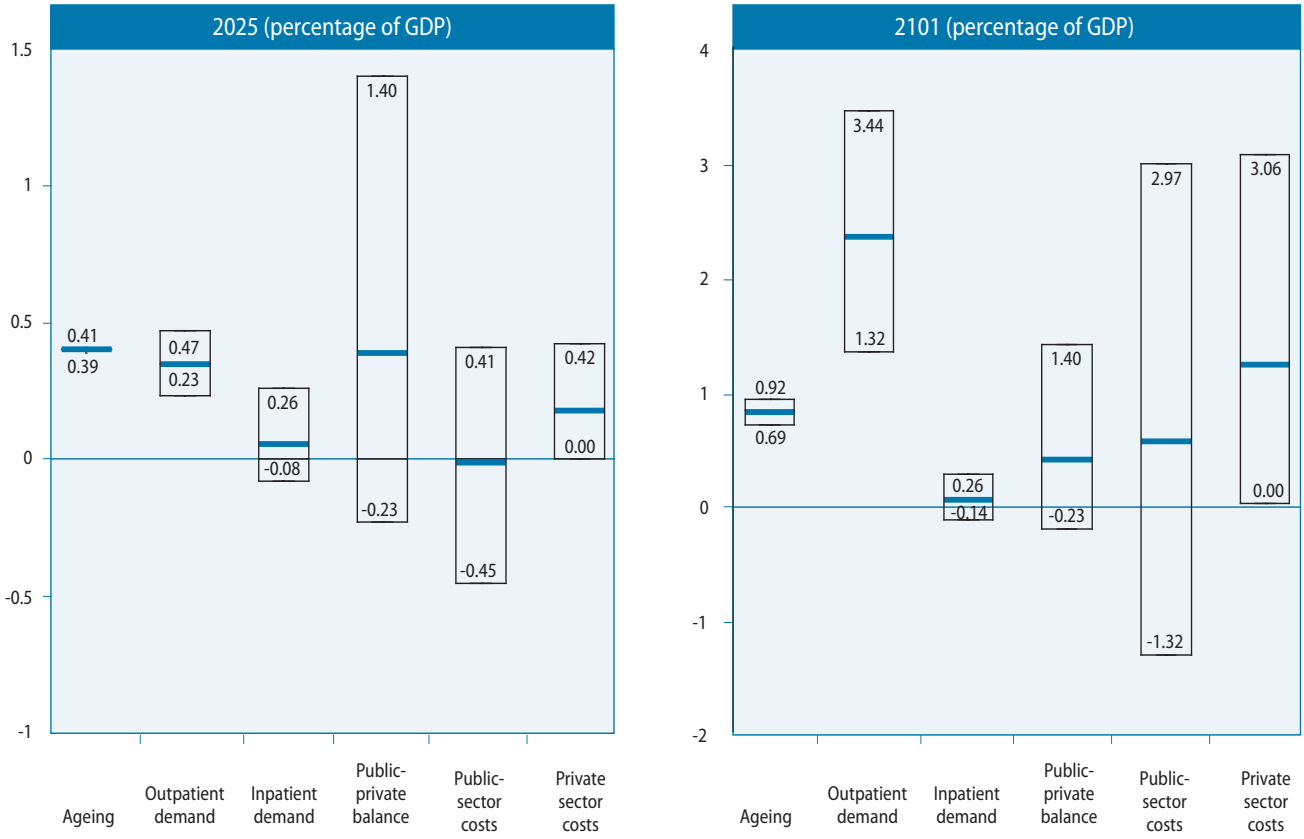
Three scenarios for projected health-care expenditures by 2101 were analysed in the study of Sri Lanka. The baseline projection assumes that the cost-drivers follow historical trends and that there will be no change in the public-private mix of provision. In this case, total national health expenditure would increase from 4.2 per cent of GDP in 2005 to 11.1 per cent in 2101. The low-cost projection envisages the Government acting to increase its role in the health sector. There would be high productivity gains from the public sector, a shift in patients from the private to the public sector and controls on price escalation in the private sector. In this case, expenditures would rise to 6.7 per cent of GDP in 2101. In the high-cost projection, government policy would work to reduce the involvement of the Government in the health sector, encourage private sector responsibility, not actively seek to control prices in the private sector and invest less effort in achieving productivity gains in the public sector. In this scenario, total national health expenditures would rise to 13.2 per cent of GDP in 2050 and to 26.4 per cent of GDP in 2101. In that year, public expenditure on health would amount to 4.8 per cent of GDP and private expenditure to 21.6 per cent of GDP. Figure VI.5 shows the impact of some of the different factors that, according to the baseline scenario, will help increase health expenditure as a percentage of GDP between 2005 and 2101. Over the longer term, outpatient activity rates would play a more important role than demographic factors in driving up this proportion.

… but not necessarily the main driver

This variance in projected health spending under different cost assumptions is in itself much higher than the impact of ageing on future health costs under the three scenarios. In fact, the demographic factor would raise health expenditures by a mere 0.7 to 0.9 per cent of GDP by 2101. The conclusion therefore is that the key driver of increasing cost will in fact be not demographic change but the changing health awareness and increased propensity of Sri Lankans to use medical care when ill. According to Rannan-Eliya (2007, p.33): "It is possible to maintain current levels of provision, access and quality levels, with no substantial increase in national health spending as a proportion of GDP, that is to say, within the range of 5-7 per cent of GDP, if productivity improvements can keep pace with ageing."

16 Productivity is measured by the non-quality-adjusted unit costs, that is to say, recurrent expenditures at the facility level divided by the volume of units of services for outpatient visits and inpatient admissions. A decline in unit costs is regarded as a productivity improvement.

Figure VI.5.
Range in impacts, under three different scenarios, of key cost drivers on national health-care expenditure in Sri Lanka in 2025 and 2101[a]



Source: UN/DESA, based on Rannan-Eliya (2007).

Note: The values in the top and bottom boxes represent the maximum and minimum; the middle bar represents the median.

a As measured by the change in health spending as a percentage of GDP from the level in 2005.

Other actuarial health cost projections

A study on Hong Kong SAR shows that innovation and higher-quality services will increase health costs

A similar actuarial study for Hong Kong Special Administrative Region of China (SAR) also found that population ageing and growth per se, without taking into account related technological innovation for chronic conditions that particularly afflict older adults, contributed relatively little to projected future health costs. Under the given assumptions of the study,[17] total health spending is projected to increase to close to 10 per cent of GDP in 2033, up from 5.5 per cent of GDP in 2001-2002. According to the projections, the share of public-health spending would gradually decline from 57 per cent in 2001-2002 to somewhere between 46 and 49 per cent by 2033 (Leung, Tin and Chan, 2007, p. 1). The results were highly sensitive to the assumption about the expected future increase in unit costs for health-care delivery. The authors concluded that adaptation of new medical technology was the major long-term cost growth-driver and that, while measures of expenditure control could perhaps slow such growth in costs, in practice the imperative to innovate and deliver higher-quality care would almost always prevail over efforts to economize.

17 These assumptions include, for the baseline scenario, increases in unit costs of health over and above average inflation of 0.8, 1.6, and 1.2 per cent per year for, respectively, public, private and other costs/charges. The baseline scenario further assumes a constant growth rate in the use of services of 0.2 per cent per annum.

An OECD study emphasizes that non-demographic factors are the key to the future increase in health expenditures

An OECD study (2006b), like the study on Sri Lanka, emphasizes the importance of the cost-push factors in health expenditures. In this study, changes in the cost of health and long-term care are determined as a result of technological progress and relative price movements in the supply of health-care services. Under a "cost pressure" scenario, health expenditures are assumed to grow at a rate that is 1 percentage point faster than the growth of mean incomes. For given trends in demographic change, this scenario projects that public-health and long-term care spending across OECD countries would almost double from close to 7 per cent of GDP in 2005 to about 13 per cent in 2050. Under a "cost containment" scenario, average expenditures would still reach 10 per cent of GDP, an increase of 3.5 percentage points (Organization for Economic Cooperation and Development, 2006b, p.7). The study observes that non-demographic factors—the effects of technology and movements in relative prices—are important in determining the degree of upward pressure on long-term care expenditures and, indeed, constitute the most important driver of the projected increase in health-care expenditures.

The compression of morbidity will mitigate the rise in future health costs

The health status of older persons in future generations also affects the projected cost estimates of health-care delivery. According to the calculations of the European Commission, Directorate-General for Economic and Financial Affairs (2006), public health care expenditures would rise from 6.4 to 7.5 per cent of GDP between 2004 and 2030 and further to 8.2 per cent of GDP in 2050 in the case of the member countries of the European Union prior to 1 May 2004 (EU-15). The more recent member States, EU-10, which were poorer when entering EU and spent less on health, would have to increase health spending from 4.9 per cent of GDP in 2004 to 5.7 per cent in 2030 and to 6.1 per cent in 2050 (ibid, p. 9). The above figures are for the "pure ageing" scenario, under which age-related expenditure per capita on health care in the base year would remain constant over time. This assumes that there would be no compression of morbidity. An alternative set of projections assumed the presence of the compression of morbidity. In this scenario, the number of years spent in bad health during a lifetime in 2050 would be identical to that in 2004, even though people are expected to live longer. In this case, public spending on health would have to increase to 7.4 per cent of GDP in EU-15 by 2050 and to 5.5 per cent of GDP in EU-10. The projections therefore show that "if healthy life expectancy (falling morbidity rates) evolve broadly in line with change in age-specific life expectancy…then the expected increase in spending on health care due to ageing would be approximately halved" (ibid, p. 16).

The epidemiological approach applied to Australia

An Australia case study used the epidemiological approach to projecting health expenditure

One weakness of the actuarial approach is that it does not take into account the disease profile of the country and its future evolution and the cost of treating each disease. The data required for this are very difficult to obtain even in developed countries, let alone developing ones. If such data were available, an alternative method could be used, namely, the epidemiological approach, whereby disease rates and the costs of treatment are projected into the future. A study for Australia (Vos and others, 2007) derived a consistent set of five epidemiological parameters for each disease, with those parameters being incidence, prevalence, remission (that is to say, cure), average duration and excess mortality. The study found that total health expenditure is expected to increase by 127 per cent in the period from 2002-2003 to 2032-2033 from A$ 71 billion to A$ 162 billion. The Australian Treasury forecasts that over the same period GDP in real terms would increase by 97 per cent (or 2.3 per cent per annum); as a result, health expenditure is projected to increase from 9.4 per cent of GDP in 2002-2003 to 10.8 per cent in 2032-2033. Of the total increase of $91 billion, about $17.7 billion would be on account of increased demand for residential long-term care (a cost increase of 242 per cent), with neurologic cases accounting for 47 per cent of long-term care expenditures in 2032-2033.

The projected cost increase is largest for diabetes (by 401 per cent), largely owing to expected growth in the prevalence of obesity, followed by that for neurologic disorders (280 per cent), musculoskeletal conditions (164 per cent) and dental services (144 per cent). Expenditures on preventing cardiovascular disease through blood pressure lowering drugs and lipid lowering drugs are projected to increase by 96 per cent, leading to an overall change in cardiovascular expenditure of 105 per cent. Increases in cancer (84 per cent), injuries (67 per cent) and maternal and neonatal services (41 and 42 per cent) would be comparatively low.

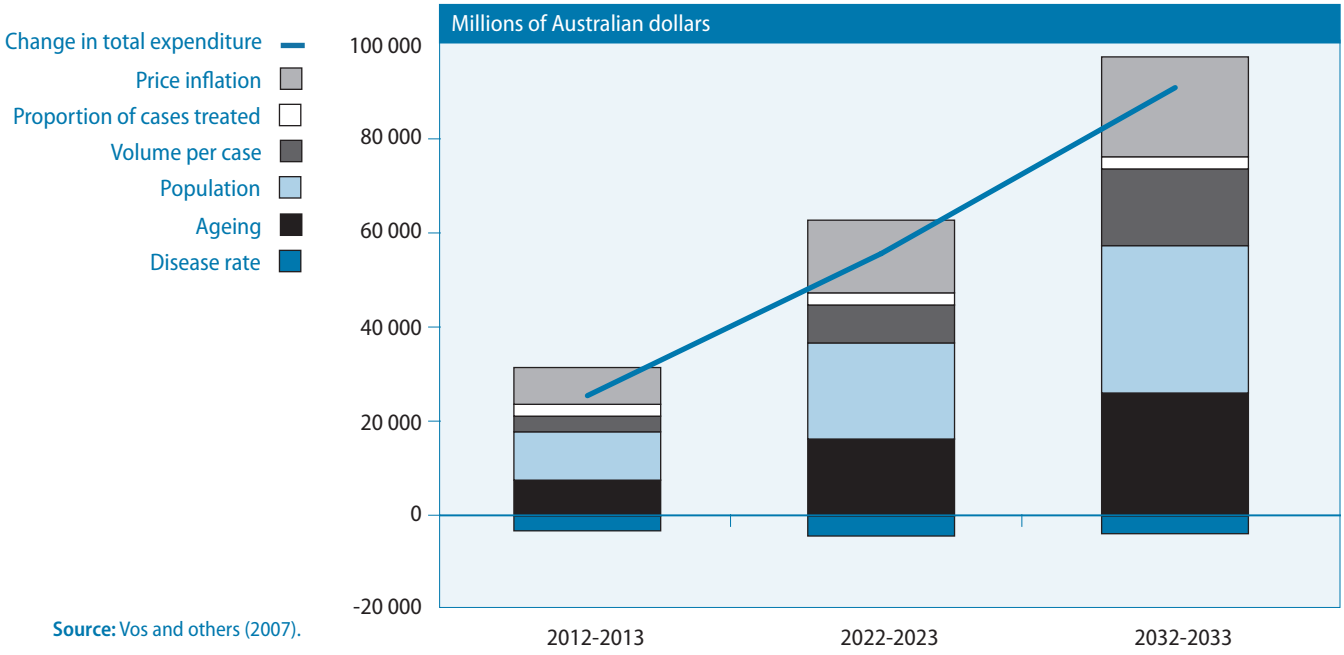
About one third of the increase in Australian health expenditures is expected to result from the ageing of the population

The study estimates that of the $91 billion growth in total health expenditure, $29 billion (32 per cent of the increase) will be due to the ageing of the population and $28 billion (31 per cent) to normal overall population growth (Australia's population is forecast to increase from 19.9 million in 2003 to 26.6 million in 2033) (see figure VI.6). Excess price inflation ($19 billion), changes in the number of health services provided per case ($14 billion) and, to a lesser extent, the proportion of cases treated ($1.3 billion) would account for smaller increases in overall expenditure. Projected health expenditures would be $1.3 billion higher if disease trends were ignored. Favourable trends in the disease rates of cardiovascular disease, chronic obstructive pulmonary disease, cancers and injuries over the period would lead to a reduction in expenditure of $5.5 billion, countered by the steep increase in the projected cases of diabetes and other diseases estimated, which would result in an expenditure increase of $4.0 billion (see figure VI.6).

Developments in health technologies and health service utilization could radically alter the picture, however

The study concedes that "in most cases the changes into the future have been estimated according to what has happened with a particular disease in the past, but the future does not necessarily repeat the past. For instance, developments in health technologies and health service utilisation may drastically alter the outlook for some diseases" (Vos and others, 2007, p. 35). Given the forces driving medical research and advances in medical technologies referred to earlier which now include considerable work on stem cells, it is highly likely that significant advances will be made over the next thirty years and that, indeed, the outlook for some diseases

Figure VI.6.
Australia: decomposition of projected change in health expenditure for all projected disease patterns between the base year of 2002-2003 and 2012-2013, 2022-2023 and 2032-2033



Source: Vos and others (2007).

could be completely different. Nevertheless, an increase in overall expenditure on health of 1.4 percentage points of GDP (from 9.4 to 10.8) between 2002-2003 and 2032-2033, especially when the size of the economy is expected to double in the same period, would seem quite manageable for a wealthy country like Australia.

The epidemiological approach helps countries identify areas where they can make progress in combating prevalent diseases

The epidemiological approach can help identify some areas where countries can make progress in combating disease. In Australia, almost all the gains in life expectancy in recent decades have occurred in just two areas: tobacco-related disease and cardiovascular health. Thus, measures to discourage tobacco use should be vigorously pursued in developing countries. In regard to cardiovascular health, the Disease Control Priorities Project in developing countries (see Jamison and others, 2006) indicated that in those countries the "poly-pill"—a combination of aspirin and blood pressure- and cholesterol-lowering agents produced cheaply as a generic drug—would be an affordable and cost-effective intervention with a sizeable impact on reducing the disease burden.

Projections of the impact of ageing on future expenditures on long-term care

In the developed countries, the obligation of the Government to contribute towards long-term care has budgetary implications; and attempts have been made, using the actuarial or the epidemiological approach, to provide estimates for the future share of GDP that will be absorbed by public long-term care costs. As shown previously, Canada, for example, allocated about 35 per cent of total per capita health expenditure for those aged 85 years or over in 2000-2001 for institutions other than hospitals. Whereas health-care services aim at changing a health-care condition, long-term care aims at making the current condition of ill health bearable and so is treated separately.

Estimates project substantial increases in future expenditure on long-term health care in developed countries …

Vos and others (2007) project that for Australia health expenditure (excluding aged long-term care) will increase by 114 per cent between 2002-2003 and 2032-2033, while that for residential aged care will grow by 242 per cent during the same period. Neurologic-related expenditure associated with dementia is expected to dominate this large increase. In the EU-15 countries, it has been estimated that the costs of public long-term care will rise from 0.9 per cent of GDP in 2004 to 1.5 per cent in 2050. In EU-10, these costs are expected to increase from 0.2 to 0.5 per cent of GDP in the same period (European Commission, Directorate-General for Economic and Financial Affairs, 2006, p. 10). According to OECD estimates, these costs are expected to increase on average from 1.1 per cent of GDP in 2005 in member countries to between 1.9 and 3.9 per cent in 2050, depending on the assumptions made (Organization for Economic Cooperation and Development, 2006b, pp. 65-72). The pure ageing effect is estimated to be 1.7 percentage points of GDP.

… but much depends on the system in place in the individual country

Public spending on long-term health care varies greatly across countries. The Scandinavian Governments are among the highest spenders. Public spending on long-term care in Denmark, for instance, was 2.6 per cent of GDP in 2005, well above the OECD average of 1.1 per cent (Organization for Economic Cooperation and Development, 2006b, p. 65). This public spending priority is part of extended social welfare provisioning. This system is sustained by high tax rates and high labour-force participation, both for men and for women, a relatively late retirement age and a higher rate of employment for those over age 60 than the EU average. These high activity levels sustain the tax base, but also require high investment in services such as childcare and services for older persons. In a way, "the services support the employment which supports the services" (United Kingdom, 1999, Research Vol. 1, chap. 6, p. 178).

Healthy ageing and preventive and rehabilitative medicine may reduce the need for long-term care

It should be noted that the Scandinavian countries are further into their demographic transition and thus the growth in demand for long-term care as a result of ageing between 2005 and 2050 is expected to be below the OECD average (Organization for Economic Cooperation and Development, 2006b, p. 65). In the Republic of Korea, in contrast, rapid ageing is projected to lead to a rise in the costs of long-term care from 0.3 to 4.7 per cent of GDP between 2005 and 2050. For Mexico, where spending was 0.1 per cent of GDP in 2005, the pure ageing effect has been calculated as adding 2.6 per cent of GDP to public long-term care costs. These figures are illustrative of the magnitudes of changes in the public cost of the provision of long-term care brought about by ageing, but these costs could be offset over time by reductions in the need for such care as a result of healthy ageing and advances in preventive and rehabilitative medicine.

Conclusions

The demographic transition towards ageing societies is almost universally accompanied by an epidemiological transition from the predominance of infectious diseases to the predominance of chronic diseases. Both transitions have been well under way in developed countries and are now under way in developing ones. Increased longevity in developing countries is the result of improved nutrition, sanitation and hygiene and, more recently, the rapid spread of medical knowledge and its application in medical practices. In the developed countries, increased longevity has been accompanied by longer healthy life expectancy and the compression of morbidity. However, a positive correlation between longevity and healthy life expectancy is not so clear in developing countries, where people are more likely to spend a greater portion of their total—and shorter—life in poor health.

An ageing population challenges health care systems in developing countries...

This chapter has demonstrated that population ageing challenges the existing national health systems in many parts of the world. Developed countries are concerned with the possibility of the future strain on national and budgetary resources as a consequence of increased demand for health- and long-term care services by an ageing population. The challenge for many developing countries is larger: they have not yet addressed adequately public-health goals such as sanitation, clean water, better nutrition, reproductive health education and mass vaccination whose achievement results, in particular, in the lowering of infant and maternal mortality rates and of the incidence of HIV/AIDS and tuberculosis. While grappling with these challenges, which largely impact upon the younger populations, developing countries are also confronting rapid population ageing, which is leading to greater demands for health-care services by older persons.

...but in and of itself, this challenge is not insurmountable

In examining such developments, this chapter has argued that the challenge they pose is large, but not insurmountable. It has shown that population ageing contributes to rising health-care spending, but is not necessarily the most significant cost-driver: By itself, its impact would be reflected in no more than a few percentage points of GDP. Indeed, the experience of many countries suggests that changes in health-seeking behaviour, in productivity in the health sector, in prices of pharmaceuticals and medical care services and in health policies are other significant cost-drivers. In the past, new drugs and treatments exerted, on the whole, an upward pressure on the prices of health-care services. Public and private health insurance has, in turn, become more comprehensive in covering such new items, in response to the desire of the public to have access to better health- and medical-care services. Yet, such increased coverage is pushing up insurance costs, and some countries are now introducing mandatory insurance to cover the cost of long-term care. Germany established a new system of statutory long-term care insurance

in 1995-1996 (United Kingdom, 1999, Research Vol. 1, chap. 6, p. 182) and Singapore formulated a family-based savings account scheme, called Medisave, in1983 (Phua and Teng, 1998). The establishment of a medical savings account scheme to finance acute care for those over age 65 has been proposed in Hong Kong SAR (Leung, Tin and Chang, 2006, p. 3).

Health-care systems must be adapted to deal with an ageing population …

Despite the challenges, policymakers in developed and developing countries are finding that the existing health-care systems can be adapted to cope with population ageing. This chapter has cautioned that the increasing number of cases of chronic illness associated with ageing and disabilities will require significant changes in the composition of overall health expenditures and in the range of services provided. At the same time, rising income levels and increasing awareness by the public of the availability and effectiveness of new medical treatment and medicines will create greater demands for health-care services, particularly in developing countries, irrespective of population ageing. These factors are likely to push up medical expenditures.

… and with the expected increase in the number of people with chronic illnesses needing long-term care

This chapter, looking beyond cost considerations, has argued that population ageing is most likely to affect the health-care system in two ways. First, the increase in the total number of cases of chronic illness and the larger number of persons with disabilities will require large shifts in health-care inputs and the acquisition by health-care professionals and workers of new skills. As noted here, per capita health expenditures on older persons in developing countries are significantly lower than those in developed countries, partly reflecting the shortage of access to the nursing, palliative care and more intensive medical treatment that are widely available to older persons in developed countries. It is suggested that developing countries need to expand such health-care services for older persons and to expand access through a combination of new tax sources and public pensions so as to cover high medical costs at older ages.

The provision of long-term care becomes more difficult in the face of changes in family structures

Second, there is the concern over how to provide long-term care for those whose health conditions are irreversible. The challenge is to find solutions that preserve the dignity and independence of those who need care, while allowing them to maintain contact with a familiar environment and not to be fearful of the consequences of entering long-term care, such as the loss of their house or other assets. The traditional family structure and the role of women, who provided much informal care to older persons, especially family members, are changing and the number of children per family is declining in many parts of the world. It will thus become increasingly difficult for many developing countries to maintain the current forms of informal long-term care arrangements, which are mainly provided by the family or friends of older persons or by their community. While every society should build a long-term care system in a manner that accords with its own traditions and the best interests of those needing such care, the trend has been to seek to provide care to persons in their own home or community. Where home care is not possible, a home-like environment in which the number of residents is not so great as to break the personal bonds between caregivers and residents is considered to be desirable.

Non-demographic factors are at least as important drivers of future health costs as population ageing

However, it is of interest to policymakers and the general public to know how much the costs of health and long-term care could grow as a result of the various factors examined above. Projections are based on, among other things, the recent trends of epidemiological patterns and per capita health-care costs by age and sex, together with information on health cost inflation, public expenditures on preventive care and collective health. Several studies show that non-demographic factors have at least as significant an impact on future health expenditure as the demographic factors. The non-demographic factors include medical price inflation, the productivity of the health sector as a whole and new technologies and pharmaceuticals. It has been noted above, however, that these non-demographic factors are also sources of uncertainties in all the projections.

Overall, these projections as well as the experience of many countries indicate that, although population ageing will definitely influence health-care expenditures, it need not con-

sume an unsustainably large share of national income in the future. What the projections into the future and the recent trends show is that population ageing will not only alter the composition of health-care spending by age, but also require the health system to introduce or to strengthen, if they are already in place, certain types of medical and long-term care services so as to cope with the increasing number of cases of chronic illness and disabilities. Policymakers in developing countries need to upgrade the existing health-care systems to encompass preventive measures, such as those aimed at reducing smoking and excessive alcohol intake and encouraging exercise and rehabilitative regimens for chronic illness, as well as palliative treatment, while improving the provision of effective essential health care for all and of those public services that improve health and reduce infection.

Health-care financing is another large challenge

The demographic and epidemiological transitions will pose challenges to health-care financing for developing countries which have to deal with the double burden of disease that is the need to combat communicable diseases while at the same time meeting the rising health demand associated with non-communicable diseases and population ageing. To meet these challenges, developing countries need to pool the financial risks associated with poor health or morbidity by adopting better-organized schemes, including insurance schemes. At the present time, private payments account for a major share of total health expenditure in developing countries. Because the scope for private insurance schemes is still limited in many developing countries, Governments should initiate risk-pooling mechanisms. In middle-income developing countries, there may be greater scope for combining social health insurance with private health insurance schemes to provide universal coverage for all, including older persons who have never been insured previously. For low-income developing countries, however, the expansion of health-care systems also needs a combination of different private and public mechanisms; but if financing this expansion risks crowding out other social goals, external financing could be needed for the formation of an ultimately self-sustaining health-care system.

International cooperation is essential to ensuring a necessary increase in the number of medical practitioners

With population ageing, the demand for medical practitioners in developed countries is set to rise. This demand must not be met through the brain drain of skilled medical staff from the developing countries. Developing countries need to strengthen their own health delivery systems, including a sufficient growth in the supply of qualified health-care personnel. This will require action in both the developed countries and the developing countries to increase the resources available for the training of medical personnel. The developed countries should expand their teaching facilities in order to train domestic medical students and also students from developing countries. They can also take steps like those taken by the United Kingdom through the 2002 Commonwealth Code of Practice for the International Recruitment of Health Workers to encourage increase domestic health-care training and eliminate recruitment in poor countries without the full approval of the host Government (Garrett, 2007, p. 31). The developing countries, too, need to expand their medical training programmes to meet present unmet needs and the new and rising demands that population ageing is already creating.