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Health transitions, disease burdens, and health expenditure patterns

In rich and poor countries alike, health needs are changing in response to lower fertility rates, longer life expectancies, and the shifting burden of illness toward chronic diseases and injuries. These demographic and epidemiological transitions will pose health challenges for countries at every income level. In high-income countries, aging populations, rapidly increasing health costs, and shrinking numbers in the workforce will put increasing pressure on publicly financed health care systems. In some middle-income countries and in most low-income countries, which already are hard pressed to provide even the most basic health services, meeting projected health needs is likely to require additional funds from external financing sources.

Developing countries account for 84 percent of global population, 90 percent of the global disease burden, and 20 percent of global GDP, but only 12 percent of global health spending (Mathers, Lopez, and Murray, forthcoming). Health financing policies designed to ameliorate these disparities are subject to numerous and ever-changing conditions, as populations change, disease burdens shift, new infectious diseases emerge, and societies cope with civil and economic unrest. This unstable policy baseline means that health financing decisions must be firmly based on evidence but also flexible enough to contend effectively with uncertainty. These decisions will affect the demand and supply of health services, the health needs of individuals and populations, and the availability of financial and technical resources to meet those needs. Despite wide variation among countries, key lessons can be learned from analyzing the evidence:

- The ongoing health transition in many developing countries—which encompasses demographic changes, such as lower fertility and longer life expectancy, as well as epidemiological changes, such as the shifting burden of illness toward noncommunicable diseases and injuries[1]—will have profound effects on the quantity and type of health services needed. These trends will increase cost pressures on health care systems in most developing countries.

- High but declining rates of population growth, coupled with increases in life expectancy, mean that developing countries will face significant increases in

population in the medium term, particularly among the working-age population and the elderly.

- Low-income countries are struggling under a large burden of communicable disease, while also confronting increases in the prevalence of noncommunicable diseases and injuries, a trend that will likely continue for some time. The availability of resources to meet these numerous health needs is limited. The international community will have to make a considerable effort to raise levels of donor assistance for health and to ensure that adequate resources are available for low-income countries to increase spending for essential health services and to meet the Millennium Development Goals.

- Middle-income countries, some with growing working-age populations, will be challenged to provide adequate employment. Whether this burgeoning population will be a demographic gift bearing economic growth or a curse bringing more unemployment and social unrest will depend on whether government policies foster economic and labor force growth. Communicable diseases among younger populations will still lead to high demands on the health system, while increased life expectancy will heighten demand on the other end of the age spectrum.

- High-income countries will also have to contend with growing proportions of the elderly and rapidly rising health expenditures. These countries face serious concerns about how a declining working-age population can support the health and social services demanded by increasing numbers of elderly, as well as the large and growing contingent liabilities of publicly financed health and pension systems.

- Though cross-country comparisons of health expenditure data are complicated by wide variations across countries, a paucity of reliable national data, and multiple data sources, it is clear that as per capita income levels rise, the public share of total health spending increases, while private and out-of-pocket shares decrease. This trend translates into greater pooling of resources and financial protection. At the lower end of the income spectrum, out-of-pocket spending accounts for the bulk of total health spending.

This chapter assesses the impacts of the demographic and epidemiological transitions, explores the complex relationships between these transitions and disease burdens, and provides estimates of the impact of these transitions on health expenditures. Current patterns of health spending by region and income class are analyzed, and the global discrepancy between health financing needs and current expenditures is discussed.

Demographic dynamics

The size and composition of the world's population have changed dramatically in the past century and will continue to change in the coming decades. The number

of people who will be demanding health services is expected to increase as a result of these changes. The size of the productive population that could support health financing schemes will also change, and this has important implications for health financing decisions.
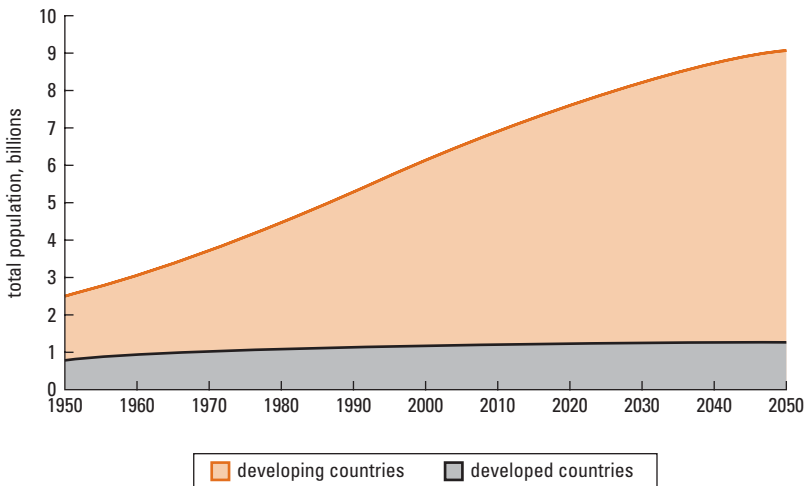
Global population

Population projections can indicate the future development of a population when certain assumptions are made about the future course of fertility, mortality, and migration. They can be helpful in estimating the impact of population change on health systems.

The world's population, which was about 2.5 billion in 1950, reached 6 billion by the end of 1999 and is projected to reach 7.5 billion by 2020 and 9 billion by 2050 (figure 1.1).[2] The world is now adding about 75 million people each year; nearly all world population growth until 2050 is projected to occur in developing countries. In contrast, the population of the developed countries is expected to remain close to its current size. Although projected population growth patterns have different implications for developed and developing countries, most countries will have difficulty generating sufficient revenues to adequately address the health needs of their increasing and aging populations.

Demographic change and health spending

All countries are experiencing varying degrees of demographic change. In general, high-income countries have low fertility and low mortality, and most of the

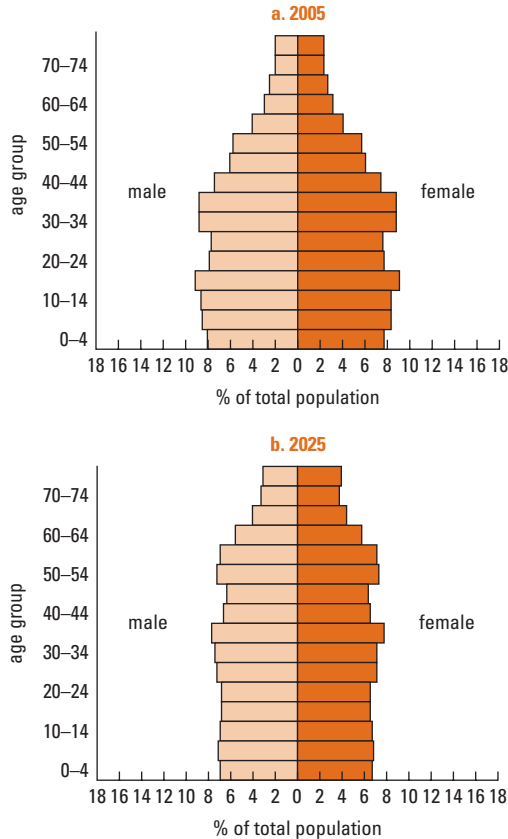**FIGURE 1.1   Global population growth, 1950–2050**

Source: United Nations 2005.

low-income countries are moving from high to low fertility, with significant variations in mortality levels. Projections for the next 50 years generally assume that population growth rates will fall, life expectancies will increase, and fertility rates will decline in all regions. As a result of varying patterns of demographic change, regions around the world will confront health financing challenges of different magnitudes at different times.

The contrasting population age structures for two regions—East Asia and the Pacific and South Asia—illustrate this point (figures 1.2 and 1.3). Overall, the average age of the populations in both the East Asia and the Pacific and the South Asia regions is older in 2025 than in 2005. The population pyramids in the figures indicate that, as fertility rates decline over time, the youngest proportion of the population shrinks, resulting in a more rectangular-shaped age pyramid.

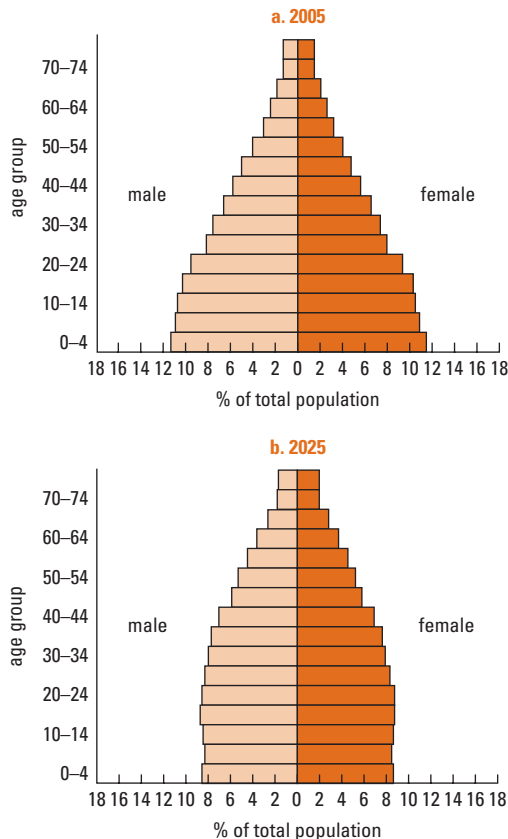**FIGURE 1.2   East Asia and Pacific population pyramids, 2005 and 2025**

Source: World Bank 2005.

(See figure A1.1 in this chapter's annex for population pyramids for the other World Bank regions.) It is important to remember that changes in the overall size of a population are the aggregate result of changes in the number of persons at different ages.

While developing economies, particularly low-income countries, are still confronting the health financing issues associated with high mortality and high fertility rates, the proportion of aging individuals in all populations will continue to increase as economic, social, and epidemiological advances occur. The future needs of these aging populations must be anticipated, and sustainable health financing schemes must be implemented in the near future to ensure that these populations have their needs met over the long term and that health systems remain functional.

FIGURE 1.3   South Asia population pyramids, 2005 and 2025

Source: World Bank 2005.

In contrast, developed economies are currently facing the challenges associated with supporting populations that have a large proportion of aging individuals. The costs to the health system posed by this segment of the population can be quite significant, because individuals generate greater health-related costs at the end of life than at any other point in their lifespan. In addition, as fertility rates decline, the proportion of the population that can contribute to health financing schemes that cover the health care costs of the elderly will eventually decrease, resulting in an increasing proportion of the population in retirement relying on a decreasing proportion of the population of working age (for example, an increase in the elderly dependency ratio).
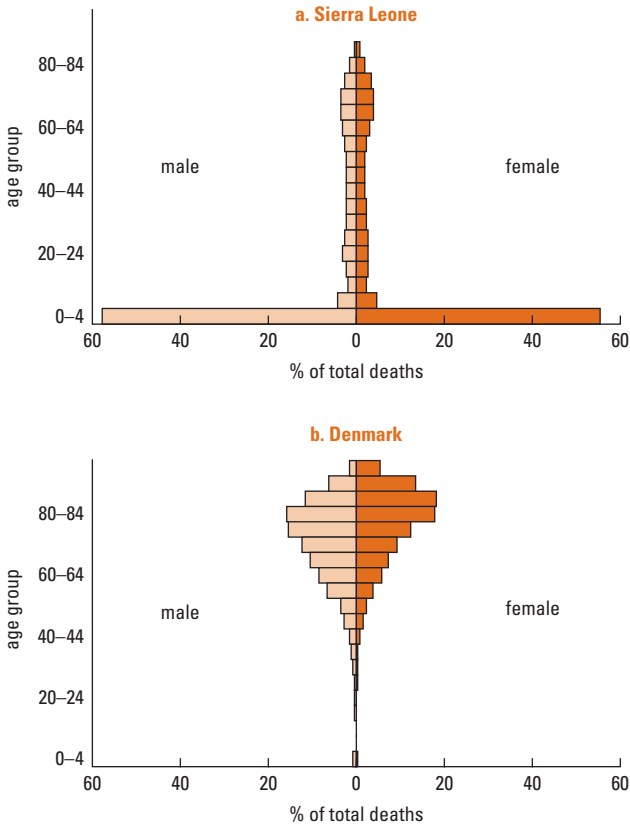
This dynamic poses particular problems for the long term, because fewer resources will be available in social protection systems (such as Social Security) that are designed to provide some financial protection in the future for the segment of the population that is currently middle aged. But in many developing countries it may be counterbalanced by population momentum to some extent, because countries with large proportions of young people will indeed have a sizable proportion of the population entering the working-age ranges for some time to come. That growing workforce, if gainfully employed, is capable of supporting health financing schemes. Lessons learned from high-income countries regarding best practices to support an increasingly aging population structure may prove useful to low- and middle-income countries in the years to come.

For example, the lessons learned by Denmark—a high-income country where the population has a long life expectancy—may prove useful to countries such as Sierra Leone, a low-income country where life expectancy is short. The two countries have dramatically different health financing needs because of the age distribution of deaths in their respective populations (figure 1.4). Most deaths in Denmark's population occur in the "old-old" age group (people age 80 or older). In contrast, most deaths in Sierra Leone's population occur in the under-five age group—indeed, very few deaths occur in the age group that is 80 or older, because few survive to that age. Thus Denmark is faced with the particularly high costs associated with the dying process of the "old-old," whereas Sierra Leone has minimal costs for that group. Furthermore, Denmark's costs are compounded by the capacity of its health system to provide technologically advanced (and expensive) health care services to people in their last years of life. Essentially, health care costs may escalate simply because the Danish health system has the capacity to provide care to the elderly. In contrast, Sierra Leone does not have the health system capacity to provide such care.

The epidemiological transition and health spending

In addition to accommodating changes in population size and structure, countries across the globe are also progressing through an epidemiological transition that has important implications for life expectancy, burden of disease, and (in turn), health financing. The epidemiological transition is the shift in the major causes of

FIGURE 1.4   Age distribution of death in Sierra Leone and Denmark, 2005

Source: United Nations 2005.

morbidity and mortality—from communicable, maternal, and childhood causes to noncommunicable diseases.

Demographic changes and the epidemiological transition are closely related. As discussed earlier, mortality levels start to decline at the beginning of the demographic transition. This is mainly caused by the reduction in mortality from infectious diseases and maternal and childhood conditions. As the health transition progresses, fertility levels and the burden of communicable diseases decline, and the average age of the population increases. Thus, eventually, there are more elderly people in the population, and they are more susceptible to noncommunicable diseases than younger people. The increase in the number of susceptible individuals at older ages increases the overall incidence and prevalence of noncommunicable diseases, thereby accelerating the epidemiological transition.

Most developing countries are currently confronting a significant challenge because of a continued high burden of communicable diseases. These diseases—particularly malaria, tuberculosis, and HIV/AIDS—pose a serious challenge for public health and health systems in many low-income countries and some middle-income countries. An estimated 80 percent of the deaths due to HIV/AIDS in 2003 occurred in Sub-Saharan Africa, and 90 percent of total deaths due to malaria occurred there as well (WHO 2003; UNAIDS 2003). Furthermore, the incidence of tuberculosis in Sub-Saharan Africa is the highest in the world (WHO 2004).
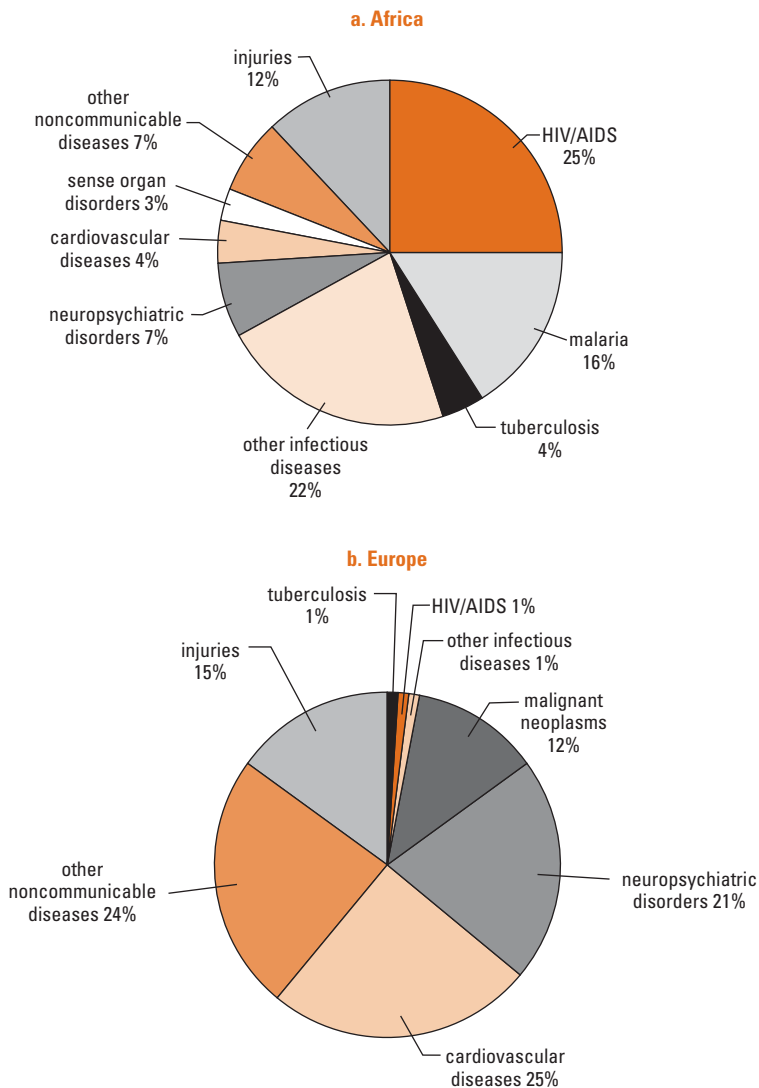
The staggering burden of disease from these major killers places a heavy burden on already weak and underfinanced health systems in low-income countries. Thirty percent of outpatient clinic visits in Africa are due to malaria-related symptoms, and these symptoms are also major contributors to inpatient deaths (WHO 2003). HIV/AIDS requires testing, counseling, treatment of opportunistic infections, and administration of antiretroviral therapy. Saving lives is of utmost importance and urgency in affected countries, but providing antiretroviral therapy is a long-term and costly undertaking, even if the drugs themselves are funded or subsidized by external sources. As such treatment is rolled out at an increasingly rapid pace, many countries will be faced with the prospect of HIV/AIDS becoming a chronic condition (in addition to a communicable disease), which poses major long-term cost burdens for both the affected individuals and the private or public programs providing support to them.

Tuberculosis is another highly prevalent and expensive disease in low-income countries, even though most of the cost for the treatment is borne by external donors. The most successful method for treating tuberculosis requires an adequate supply of antibiotics as well as intensive participation of health staff to monitor the administration of treatment, which raises both cost and workforce issues. The recent outbreaks of sudden acute respiratory syndrome (SARS), as well as avian influenza in Asia and Europe, are chilling reminders that even the most prescient planning in health systems and health financing may not be enough to counter the global threat of emerging infectious diseases.

The epidemiological transition influences health systems and health financing by affecting population health needs and the type and level of services demanded, and thus the amount and distribution of funds available to pay for them (WHO 2002). As disease burdens shift, health systems need to adapt, expanding or narrowing the scope and scale of services provided and integrating new technologies and approaches as needed.

Figure 1.5 displays the dramatic differences in disease burdens in Sub-Saharan Africa and Europe. Coping with the current burden of communicable diseases, and at the same time laying the groundwork for transforming the health system to deal with the impending noncommunicable disease burden, presents the major

FIGURE 1.5   Global burden of disease, 2002

a. Africa

injuries
12%

other
noncommunicable
diseases 7%

sense organ
disorders 3%

cardiovascular
diseases 4%

neuropsychiatric
disorders 7%

other infectious
diseases
22%

HIV/AIDS
25%

malaria
16%

tuberculosis
4%

b. Europe

tuberculosis
1%

HIV/AIDS 1%

other infectious
diseases 1%

injuries
15%

malignant
neoplasms
12%

other
noncommunicable
diseases 24%

neuropsychiatric
disorders 21%

cardiovascular
diseases 25%

Source: WHO 2004.

challenge for health policy makers in both African and other developing countries. High-income countries, with both significantly more resources and a more stable but overarching burden posed by noncommunicable diseases, face serious health financing and delivery issues but have far more financial latitude to act.
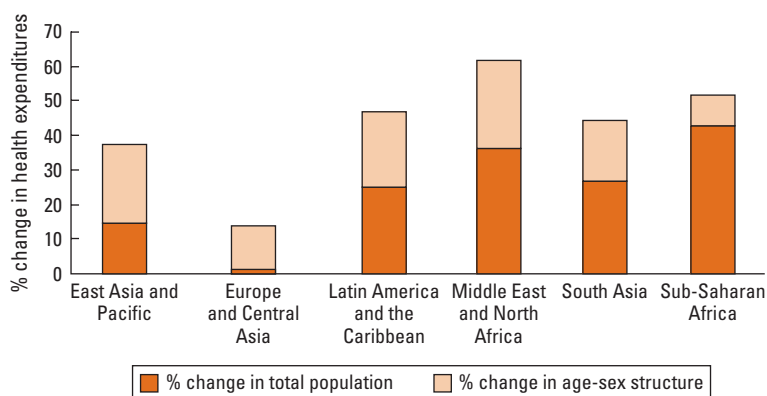
Implications of demographic and epidemiological transitions for health financing

Although changes in the size and age structure of the population will surely have important consequences for current and future health financing needs, the exact impact is subject to debate. Some researchers have found that health expenditures among an aging population will continue to exert significant pressures on health systems for years to come; others contend that at least in the high-income setting, the aging populations are increasing but healthier, so the effect on health expenditures may not be as serious as anticipated (Olin and Machlin 1999; Fogel 2003; see also chapter 9).

Some low-income countries and many middle-income countries will spend both proportionately and absolutely more on health because of both population increases and higher proportions of the elderly (especially the very elderly). As discussed earlier, the increase in the portion of the elderly population will lead to some increase in overall health expenditures (although the effect will vary by country), given that, on average, health care costs among the elderly are much higher than among other segments of the population (Fogel 2003; Mahal and Berman 2001). As Mahal and Berman point out, "Over time, the share of aggregate health spending accounted for by the elderly can vary depending on their share of the population and whether health spending per person is changing differentially across various age groups" (2001, p. 5). Actuarial estimates using per capita health expenditures in the United States show that a person age 65 to 74 spends, on average, between 3.0 and 4.4 times as much as a person age 35 to 44, and the amount is even higher for someone over 80 (Mays and Lazar 2003; Cutler and Meera 1997; Reinhardt 2000).

Figure 1.6 provides information by region on projected changes in total health spending between 2005 and 2025, as a result of both changes in the numbers of people and changes in the demographic structure of the population—assuming that the base year per capita health spending by age and sex remains unchanged.[3] Alternatively, the figure shows what the spending levels in 2005 would be if each region had its 2025 population structure. For each region, three figures are provided: (1) total effect—changes in total spending as a result of changes in the numbers of people and the age-sex structure, (2) growth effect—changes in total spending due only to changes in the numbers of people, and (3) age-sex structure effect—changes in spending as a result of a person's sex and age bracket.[4]

The figure shows large differences across regions in both the total increases in health spending and the extent to which such increases are the result of changes in population size and age-sex structure. For example, the Middle East and North

FIGURE 1.6 Effects of changes in numbers of people and age-sex structure on health spending by region, 2005–25

Source: 2000 National Medical Expenditures Survey and HNPStats (Health, Nutrition, and Population database compiled by the World Bank).

Africa, a middle-income region with high population growth rates and relatively long life expectancies, will face a 62 percent increase in health spending over this 20-year period (some 3 percent per year) as a result of population changes alone. Of that total increase, almost three-fifths (37 percentage points) are attributable to increases in population size and the remaining two-fifths (25 percentage points) are due to age-sex structure changes. In contrast, Sub-Saharan Africa, a low-income region characterized by high population growth rates and short life expectancies, will experience a 52 percent increase in health spending, of which 43 percentage points are the result of population growth and only 9 percentage points are the result of age-sex structure changes.

In Europe and Central Asia, a middle-income region with close to zero population growth and long life expectancies, health spending is expected to rise 14 percent overall: 1 percentage point is the result of population growth, and the other 13 percentage points are the result of age-sex structure changes. Latin America and the Caribbean, another middle-income region with moderate population growth and long life expectancies, will experience an overall spending increase of 47 percent, of which 25 percentage points are the result of population growth and 22 percentage points are the result of age-sex structure changes.

East Asia and the Pacific, where population growth is moderate, and South Asia, where it is rapid, also provide interesting contrasts. Life expectancies in East Asia and the Pacific are near the median for developing countries and higher than in South Asia, which, nevertheless, has life expectancies significantly higher than Sub-Saharan Africa. In East Asia and the Pacific, health spending will increase by 37 percent, of which 15 percentage points are the result of population growth and 22 percentage points are the result of changes in the age-sex structure. In South

Asia total spending will increase by 45 percent, of which 27 percentage points are the result of population growth, and 18 percentage points are the result of age-sex structure changes.

Although this analysis is simplistic, it does indicate the orders of magnitude of spending changes that are likely to result as populations grow and age. Excluding Europe and Central Asia, overall increases of 37 percent to 62 percent indicate that governments would need to increase their health spending by two or three percentage points a year just to accommodate demographic changes. These are not insignificant increases, given the relatively low growth rates in GDP expected in several regions highlighted below. They are clearly lower bounds on increases, because they do not take into account critical factors such as the development of new technology, the pace of inflation, or the scope of insurance coverage. Nor do these estimates include the impact of potential new medical crises such as avian flu or the availability of new and expensive drugs to treat malaria. The proportion of the increases due to population increases verses age-sex composition changes also provides policy makers with rudimentary information on changes needed in health delivery systems.

Global distribution of health expenditures

Accurate cross-country comparisons of national health expenditure data are complicated by the fact that many developing countries do not have national health accounts. The following discussion relies on estimates from country-level data compiled by the Organisation for Economic Co-operation and Development (OECD), the World Health Organization (WHO), and the World Bank. Estimates for external resources on health are based on aggregates from the OECD, donor governments, and private foundations.

In analyzing health spending patterns, it is important to distinguish between the sources of health spending and the revenue bases that support these funding sources. National health accounts provide data on sources of health spending, as well as the uses of health spending. Such data give information only on the immediate source of the expenditure, whether from the public sector (e.g., expenditures financed through governmental bodies or social insurance funds), the private sector (e.g., expenditures financed out of pocket and by private insurance), or external sources (e.g., grants or loans from international donors). The mix of these sources has many implications for health systems, particularly in terms of access, equity, efficiency, and financial sustainability.

National health accounts do not provide information on the sources of the government revenues that finance these expenditures (general government tax and nontax revenues, earmarked payroll tax contributions, households, and so on). Revenue source data are critical for understanding the equity of contributions (tax/revenue incidence) and the efficiency and sustainability of the revenue base, whereas the spending information is critical for understanding technical and

allocative efficiency, the equity of benefits (benefit incidence), administrative costs, and risk pooling. Expenditure sources and patterns are discussed in this chapter; revenue sources are discussed in chapter 2.
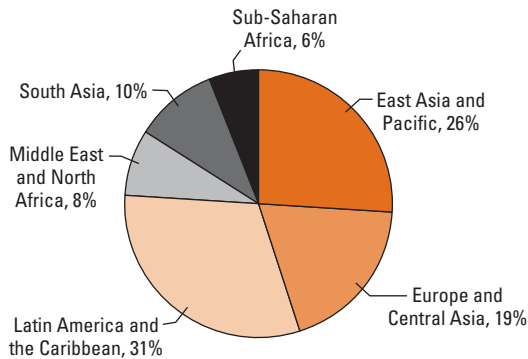
It is clear that low- and middle-income countries bear a disproportionately large share of the global burden of disease compared with high-income countries, yet they spend proportionately very little on health. In 2002 some $3,198 billion (about 10 percent of global GDP) was spent on health care worldwide (World Bank 2005). Yet only about 12 percent of the total was spent in low- and middle-income countries, which account for 84 percent of the global population, 20 percent of global GDP, and 90 percent of the global disease burden (Mathers, Lopez, and Murray 2006). Shares of global GDP and health expenditures are disproportionate by region and income level (figure 1.7).

FIGURE 1.7   Global distribution of GDP and health expenditures in developing countries, 2002

a. Total health expenditures = $351 billion (12% global total)

- Low-income countries, 2%
- Middle-income countries, 10%
- High-income countries, 88%

b. Total GDP in developing countries = $6,319 billion (20% global total)

- Sub-Saharan Africa, 6%
- South Asia, 10%
- Middle East and North Africa, 8%
- East Asia and Pacific, 26%
- Europe and Central Asia, 19%
- Latin America and the Caribbean, 31%

Source: World Bank 2005.

Sources of health spending

Information from several sources about the nature and sources of health spending is essential for developing sound national policies for financing health care. Beyond basic economic indicators such as GDP and GDP per capita, it is helpful to calculate health spending–related measures, including per capita health spending, total health spending as a share of GDP, the public share of total health spending, the percentage of public spending by social security organizations, the private share of total health spending, the percentage of private spending out of pocket, and the share of total health spending through external assistance. For absolute comparisons across countries, amounts should be denominated in U.S. dollars adjusted by standard exchange rates or by purchasing power parities.

Another important element in providing aggregated global and regional information on health spending patterns is the weighting system used to aggregate individual country information to global, regional, and income class levels. Using individual country weights (treating each country the same) provides a measure of the average impact by country. However, weighting by population may also be appropriate, given that some countries have much larger populations than others, and global health policy often focuses on numbers of people in need when calculating external assistance costs. Tables A1.1 and A1.2 in the annex provide health spending information for various components of health expenditure using population and country weights. The following analysis focuses on the population-weighted information. Country-weighted figures are discussed for those components in which there are large differences and in those cases in which country averages may be more meaningful (such as public shares of total health spending and average external assistance by country and region).

High-income countries spent, on average, more than 10 percent of GDP on health in 2002, while middle-income countries and low-income countries spent some 6 percent and 5.3 percent, respectively (annex table A1.1). In exchange rate–based U.S. dollars, per capita total health spending was $26 in South Asia, $32 in Sub-Saharan Africa, $64 in East Asia and the Pacific, $99 in the Middle East and North Africa, $151 in Europe and Central Asia, and $218 in Latin America and the Caribbean. These figures compare with an average per capita health expenditure level in high-income countries of $3,039—an amount more than a hundred times the average spent in all low-income countries ($30). Even after adjusting for differences in costs of living, the differentials are still on the order of 30 times the level in low-income countries (discussed in chapters 6 and 7). The health spending figures in low-income countries fall far short of the amounts needed to provide an essential package of services or to scale up to meet the Millennium Development Goals.

The public share of total health spending provides a measure of how actively governments intervene to ensure the financing of basic public health and personal health services, protect the poor, and facilitate risk pooling through public

programs. Public shares increase as countries' incomes increase (annex tables A1.1 and A1.2). Based on population-weighted data, public shares increase from 29 percent in low-income countries to approximately 50 percent in middle-income countries, to 65 percent in high-income countries. The comparable country-weighted figures are 48 percent, approximately 60 percent, and 71 percent, respectively. The key points here are that the bulk of all health spending in low-income countries is private and that, as countries get richer, they cover increasing amounts of health services through the public sector as a result of market failures in private health insurance markets, information asymmetries, and other well-known market failures in the health sector.

Two other important spending trends are apparent from annex tables A1.1 and A1.2. These are the very small share of total health spending derived from social security spending in low-income countries and regions and the importance of out-of-pocket costs in private spending. In Sub-Saharan Africa only 2 percent of all public spending on health (less than 1 percent of total health spending) is made through social insurance institutions, in South Asia it is 8 percent, and for all low-income countries it is 6 percent. Country weighting does not appreciably change this picture. However, for East Asia and the Pacific and middle-income countries, population weighting generally results in significantly higher social security shares.

The importance of out-of-pocket spending in both private and total health spending is a key measure of both the lack of risk pooling (see chapter 2) and the potential inequities in health financing, given poor people's limited ability to pay. Out-of-pocket expenditures are defined as any direct outlay, including gratuities or in-kind contributions, that households make for services and goods from health practitioners, pharmacists, medical supply vendors, and others. Out-of-pocket spending accounts for 93 percent of private spending and more than 60 percent of total health spending in low-income countries (annex table A1.1). In both Sub-Saharan Africa and South Asia, roughly half of all health spending is out of pocket. When countries move up the economic ladder and pursue equity and risk pooling goals increasingly through public financing and the facilitation of private health insurance markets, public shares increase and out-of-pocket shares decrease. In high-income countries, out-of-pocket spending accounts for less than 20 percent of total health spending. Country weighting reduces the out-of-pocket shares somewhat (they account for more than 40 percent of total low-income country health spending), but the story remains the same.

External funds accounted for almost 8 percent (on average) of total health spending in low-income countries in 2002, 18 percent in Sub-Saharan Africa, and 2 percent in South Asia. However, the picture changes appreciably with country weighting, as evidenced by the fact that external assistance accounts for 20 percent of all spending in low-income countries, 19 percent in Sub-Saharan Africa, and 11 percent in South Asia and in East Asia and the Pacific. In 13 Sub-Saharan African countries, external financing accounted for more than 30 percent of overall health

spending (Schieber and others forthcoming). External funding is an important and growing source of financing in low-income countries and in Sub-Saharan Africa and South Asia. Given the constraints on domestic resource mobilization in low-income countries, large increases in external assistance are critical for scaling up to reach the Millennium Development Goals (see chapter 2).

There is a clear upward trend between countries' income levels and the levels of public and total health spending as a share of GDP (figure 1.8). However, spending for any given income level varies a great deal, particularly at lower-income levels (Musgrove, Zeramdini, and Carrin 2002). The composition of private health spending also differs across income levels. As incomes increase, both private and out-of-pocket shares of total health spending decrease, and public spending predominates.

Low- and middle-income countries with high levels of out-of-pocket spending have limited opportunities for risk pooling, which hinders allocative efficiency and financial protection efforts.[5] Moreover, low overall spending levels in many low-income countries and some middle-income countries result in limited access to essential services and financial protection, particularly for the poor. As Musgrove (2004) indicates, if GDP is adjusted for basic subsistence needs, poor countries appear to be spending a substantial share of their postsubsistence income on health, reinforcing much of the discussion in the following chapters regarding the need to dedicate additional funds from external financing sources to health.

FIGURE 1.8   Total and public health spending by GDP per capita, 2002

Source: World Bank 2005.

Annex 1.1 Population pyramids and global health expenditures by region and income group

FIGURE A1.1 **Population pyramids for World Bank regions**

a. Eastern Europe and Central Asia

b. Latin America and the Caribbean

Source: World Bank 2005.   *(Continues)*

FIGURE A1.1   Population pyramids for World Bank regions *(Continued)*

c. Middle East and North Africa

2005 population pyramid. age group (vertical axis) from 0–4 to 70–74; male (left), female (right); % of total population axis: 18 14 10 6 2 0 2 6 10 14 18

2025 population pyramid. age group from 0–4 to 70–74; male (left), female (right); % of total population axis: 18 14 10 6 2 0 2 6 10 14 18

d. Sub-Saharan Africa

2005 population pyramid. age group from 0–4 to 70–74; male (left), female (right); % of total population axis: 18 14 10 6 2 0 2 6 10 14 18

2025 population pyramid. age group from 0–4 to 70–74; male (left), female (right); % of total population axis: 18 14 10 6 2 0 2 6 10 14 18

TABLE A1.1 Composition of health expenditures in high-, middle-, and low-income countries, population-weighted averages, 2002

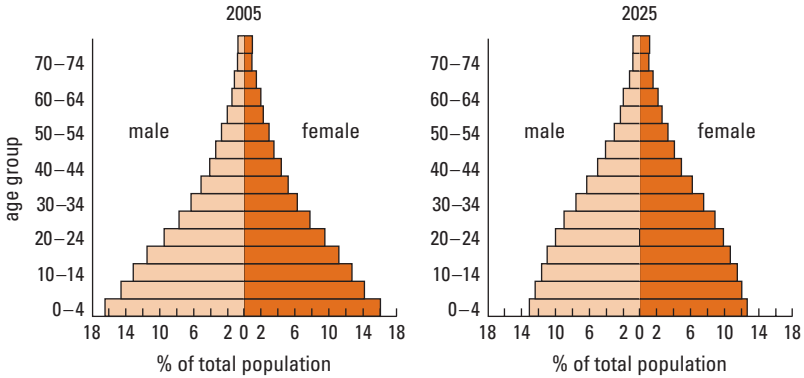|	Per capita GDP (current US$)	Per capita GNI (current US$)	Per capita health expenditures (US$)[a]	Per capita health expenditures (international dollar rate)[b]	Total health expenditures (% of GDP)	Public health expenditures (% of total health expenditures)	Social security expenditures (% of total public health expenditures)	Private (% of total health expenditures)	Out-of-pocket (% of private health expenditures)	External (% of total health expenditures)
Regions										
East Asia and the Pacific	1,013.68	999.76	63.66	250.30	5.21	35.29	39.35	64.71	91.86	0.72
Eastern Europe and Central Asia	2,416.54	2,371.17	151.07	459.29	5.93	61.33	41.35	38.67	85.10	1.58
Latin America and the Caribbean	3,284.31	3,182.82	217.85	515.57	7.04	50.27	32.50	49.73	74.28	1.39
Middle East and North Africa	2,153.12	2,105.48	98.92	252.17	4.83	44.92	23.60	55.08	84.77	1.02
South Asia	475.17	471.92	26.04	140.39	5.45	23.66	8.04	76.34	97.08	2.48
Sub-Saharan Africa	487.14	440.72	31.58	119.71	5.32	39.58	1.92	60.42	79.17	17.58
Income levels										
Low-income countries	423.63	408.55	29.52	115.18	5.30	29.14	6.18	70.86	92.84	7.89
Lower-middle-income countries	1,333.33	1,309.93	81.60	304.50	5.60	41.59	35.55	58.41	86.02	0.86
Upper-middle-income countries	5,266.89	5,156.73	309.96	602.33	6.18	56.27	53.43	43.73	82.93	0.43
High-income countries	27,464.45	27,653.55	3,039.30	3,168.54	10.37	65.15	43.95	34.85	55.78	0.03

Sources: World Bank 2005; IMF 2005; WHO 2005.

a. Exchange rate–based U.S. dollars.

b. Purchasing power parity–adjusted U.S. dollars.

TABLE A1.2 Composition of health expenditures in high-, middle-, and low-income countries, country-weighted averages, 2002

	Per capita GDP (current US$)	Per capita GNI (current US$)	Per capita health expenditures (US$)[a]	Per capita health expenditures (international dollar rate)[b]	Total health expenditures (% of GDP)	Public health expenditures (% of total health expenditures)	Social security expenditures (% of total public health expenditures)	Private (% of total health expenditures)	Out-of-pocket (% of private health expenditures)	External (% of total health expenditures)
Regions										
East Asia and the Pacific	1,170.04	1,195.70	96.14	198.72	5.86	61.76	8.32	38.24	80.73	11.44
Eastern Europe and Central Asia	2,432.28	2,380.18	152.11	434.02	5.79	61.24	45.06	38.76	94.31	3.42
Latin America and the Caribbean	3,445.66	3,269.69	217.78	431.18	6.62	55.47	26.20	44.53	81.78	3.47
Middle East and North Africa	2,708.87	2,613.70	143.71	290.41	5.29	47.57	15.41	52.43	78.32	2.46
South Asia	767.90	735.86	27.50	95.11	4.81	46.67	8.91	53.32	93.75	11.32
Sub-Saharan Africa	954.93	806.64	47.34	133.07	5.08	51.36	3.17	48.64	79.59	19.44
Income levels										
Low-income countries	452.74	348.29	26.76	82.44	5.18	48.39	4.07	51.61	85.26	19.83
Lower middle-income countries	1,514.00	1,504.44	94.19	282.64	5.89	55.82	21.94	44.18	81.34	4.73
Upper middle-income countries	5,152.12	4,950.51	308.38	578.45	6.10	63.59	34.75	36.41	84.09	1.85
High-income countries	22,794.32	22,918.68	1,921.84	2,258.50	7.94	70.51	36.68	29.48	74.66	0.18

Sources: World Bank 2005; IMF 2005; WHO 2005.

a. Exchange rate–based U.S. dollars.

b. Purchasing power parity–adjusted U.S. dollars.

Endnotes

1. As introduced by Mosley, Bobadilla, and Jamison (1993), the "health transition" encompasses the relationship among demographic, epidemiologic, and health changes that collectively and independently have an impact on the health of a population, the financing of health care, and the development of health systems.

2. According to United Nations medium projections (United Nations 2005) and World Bank projections (World Bank 2005).

3. Because age-sex–specific health spending weights for developing countries are generally not available, U.S. spending weights are used. This may result in overstating the age-sex impact, because the weights reflect the higher levels of technology and resources in the United States, much of it disproportionately focused on the elderly, compared with the levels in developing countries. Nonetheless, much of the health spending in developing countries goes to teaching hospitals in large urban settings and also may disproportionately benefit the rich and elderly.

4. The total effect is calculated by multiplying the number of males and females in each age group by an age-sex–specific spending weight and then dividing the total age-sex weighted spending for 2025 by the total for 2005. The population growth effect is calculated by dividing the projected 2025 total population by the 2005 total population. The age-sex composition effect is calculated as a residual by dividing the total effect by the growth effect. This age-sex effect reflects the changes in the age and sex composition of the population, as well as the interaction of this structural change with changes in the size of the population. Because changes in sex composition are quite small, the results largely reflect age structure changes.

5. For a detailed analysis of country-specific and global health expenditure trends, see Musgrove, Zeramdini, and Carrin (2002).

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