Global Health and Population Aging

The age structure of the world has been changing as people have fewer children and live longer. The number of people ages 60 and older is rising rapidly and is expected to exceed the number of 15-to-24-year-olds within two decades (Bloom and Canning 2005). Historically, many of the early gains in life expectancy reflect declines in infant and child mortality, resulting from improved sanitation and medical interventions such as vaccinations and antibiotics over the last two centuries. More recent gains in life expectancy and projected gains, however, are mostly associated with reduced death rates at middle and older ages.

Not all countries have experienced the same gains in life expectancies. In high-mortality, low-income countries, deaths of children make up a large fraction of all deaths. In low-mortality, high-income countries, the elderly account for most deaths (see table, page 2). Accordingly, elimination of childhood infectious diseases has the greatest effect on reducing mortality in poor countries, and treatments for adult conditions have the greatest effect in rich countries.

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Living Longer and Healthier?

As we live longer, are we also living healthier?

The Global Burden of Disease Project combined information about death and illness to assess the total loss of healthy years of life due to disease and injury. Estimates from this project indicate that among people of all ages, noncommunicable diseases account for a large share—85 percent—of the number of years spent in ill health in high-income areas including the United States and Western Europe (see figure, page 2). Among people ages 60 and older, heart disease, cancer, and other chronic illnesses already account for over 87 percent of health problems globally.

Chronic diseases associated with lifestyle and environment may progress into disability, but it is not clear that as we live longer more people will live with disabilities. In the United States, a significant reduction in disability has accompanied increased longevity, but countries show varying disability trends among older people (OECD 2005). In Denmark, Finland, Italy, and the Netherlands, as in the United States, rates of severe disability have dropped. In contrast, even as the population has aged, disability rates remain stable in Australia, Canada, and France. In Belgium, Japan, and Sweden, severe disability rates have increased.

In the next 10 to 15 years, heart disease, cancer, diabetes, and other chronic illnesses will produce greater declines in health and take more lives than infectious and parasitic diseases (Lopez et al. 2006). This is a major shift in the pattern of causes and transmission of diseases. The aging of the world's population is partly responsible for these changes. Many more people survive into adulthood and into old age, long enough for health behaviors such as poor diet or smoking, and environmental factors such as indoor pollution and stress, to take their toll.

The Population Aging Factor

If world population size did not change and the share of the population in each major age group remained the same, the number of deaths would decline between 2002

In wealthier countries, dealths of older adults represent the largest share of all deaths annually.

Selected causes of death	Accepted treatment/prevention	Millions of deaths, 2002		
		All countries	Low-income countries	High-income countries
Respiratory infections	Antibiotics	3.96	2.90	0.34
HIV/AIDS	Retroviral therapy	2.78	2.14	0.02
Perinatal deaths[a]	Prenatal/postnatal care	2.46	1.83	0.03
Diarrheal disease	Oral rehydration therapy	1.80	1.50	0.00
Tuberculosis	DOTs[c]	1.57	1.09	0.01
Malaria	Partially treatable	1.27	1.24	0.00
DPT/measles/polio[b]	Vaccinations	1.12	1.07	0.00
Percent of total deaths				
Children 0-4		18.4	30.2	0.9
Adults 60+		50.8	34.2	75.9

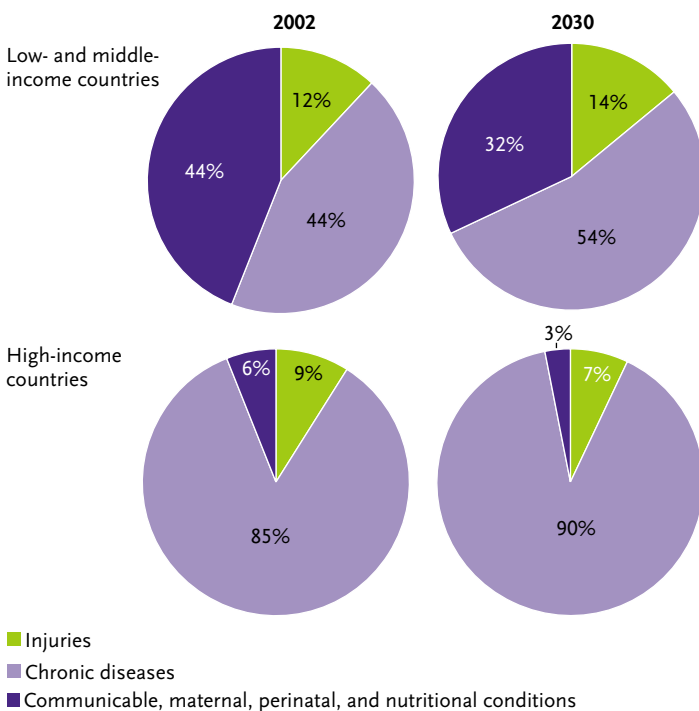[a] Deaths within the first seven days of life.
[b] Diphtheria, pertussis (whooping cough), and tetanus.
[c] Directly Observed Therapy shortcourse.
Note: Data are based on data from the World Health Organization and subject to substantial margin of error.
Source: Angus Deaton, "Global Patterns of Income and Health: Facts, Interpretations, and Policies," WIDER Annual Lecture, Helsinki, Sept. 29, 2006.

Chronic diseases are an increasing proportion of the burden of disease.

Low- and middle-income countries

2002: 12% Injuries, 44% Chronic diseases, 44% Communicable, maternal, perinatal, and nutritional conditions

2030: 14% Injuries, 54% Chronic diseases, 32% Communicable, maternal, perinatal, and nutritional conditions

High-income countries

2002: 9% Injuries, 85% Chronic diseases, 6% Communicable, maternal, perinatal, and nutritional conditions

2030: 7% Injuries, 90% Chronic diseases, 3% Communicable, maternal, perinatal, and nutritional conditions

■ Injuries
■ Chronic diseases
■ Communicable, maternal, perinatal, and nutritional conditions

Source: Alan D. Lopez et al., eds., *Global Burden of Disease and Risk Factors* (Washington, DC: The World Bank, 2006).

and 2030 (Mathers and Loncar 2006). Health improvements—declines in age-specific mortality rates—would lead to fewer deaths globally. Health improvements related to infectious diseases, malnutrition, chronic diseases, and injuries are projected to reduce mortality globally. (HIV/AIDS is the exception to this pattern.)

Because the risk of dying from any specific condition changes with age, population aging may affect the number of deaths in a country. If the number of people over age 60 increases and mortality rates for this group remain the same, then the number of deaths will increase due to population aging. For most communicable diseases and for maternal, perinatal, and nutritional conditions, population aging should decrease the number of deaths globally. This change will occur largely because children tend to be most at risk of dying from these conditions. HIV/AIDS is again the major exception. Both population growth and aging are projected to add to the number of deaths from HIV/AIDS (Mathers and Loncar 2006).

For noncommunicable diseases, population growth and aging will each increase deaths in all regions of the world. However, the increase in deaths due to changes in the shares of the population in older age groups will be more than twice the increase attributable to changes in the size

of the world population. In lower middle-income countries, population aging will play a more important role than population growth in increasing deaths from noncommunicable diseases. Population growth will have the largest relative impact for low-income countries and the smallest for lower middle-income countries such as those eastern European countries with shrinking populations.

Heart Disease v. Cancer

In the United States, an aging population will influence trends in the causes of death such that the proportion of deaths attributable to heart disease will rise faster than the proportion caused by cancer (Sonnenschein and Brody 2005). The aging population contributes substantially to the increase in mortality from heart disease because the risk of dying from heart disease rises dramatically after age 65. The risk of dying from cancer, however, increases more slowly with age.

According to the Centers for Disease Control and Prevention, heart disease is the leading cause of death in the United States and cancer ranks second. The number of deaths from heart disease, as a proportion of the population, has been declining over the past 40 years, but has recently leveled off. Much of this decline is the result of progress in reducing important risk factors such as cholesterol levels. Without further progress in reducing other risk factors such as obesity, deaths from heart disease will likely increase nearly threefold—from 739,658 in 2000 to 2,104,834 in 2050 (Sonnenschein and Brody 2005). In the same period, deaths from cancer will probably increase slightly more than twofold—from 558,723 to 1,259,518.

Demographic Dividend

As death rates decrease, the proportion represented by each age group in the population changes. Initially, increases in child survival result in more people at the young ages than in earlier generations, creating a baby boom. Over time, as more children survive birth, people have fewer children. This sequence of changes means that, for a time, the working-age population will be larger than the child population and the older age groups, producing a bulge at these ages.

A larger working-age population represents an opportunity for greater economic growth, the potential for a "demographic dividend." In developed countries that have already experienced a baby boom, as the United States has, increased labor supply, higher female participation in the labor force, more incentives to invest in education, and

greater rates of personal savings have accompanied this boom and the increase in life expectancy. According to economists David Bloom and David Canning (2005), this demographic dividend, however, is not automatic. A lack of appropriate policies to encourage new businesses to use this increased supply of labor might result in unemployment and higher crime rates. Openness to international trade, labor laws flexible enough to allow businesses to respond to changing global and national conditions, and a financial environment that encourages investment are among the factors necessary to capitalize on the stage of population aging that increases labor supply.

Because population aging is a new phenomenon, there is no precedent on which to judge its likely effects. Although analysts expect that the labor supply will fall and thus slow down economic growth, this effect is not certain. If the risk of disease and disability in old age continues to lessen, people may work longer than they currently do.

A Virtuous Circle

The demographic dividend described above is essentially a product of health improvements that reduce child mortality and malnutrition (Bloom, Canning, and Jamison 2004). Such health improvements may encourage economic growth through:

- The connection between healthier children and a healthier and more productive work force.
- Improved school attendance (leading to higher education levels).
- Greater savings over the life cycle because of increased life expectancy.

Health improvements, in effect, lead to greater income per person, and rising incomes spur further health improvements. However, the relationship between health and income ends as health improvements for the older adult population do not provide the same benefits as improvements that reduced child mortality and increased the size of the young adult population.

References

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The NIA Demography Centers

The National Institute on Aging supports 13 research centers on the demography and economics of aging, based at the University of California at Berkeley, the University of Chicago, Harvard University, the University of Michigan, the National Bureau of Economic Research, the University of North Carolina, the University of Pennsylvania, Pennsylvania State University, Princeton University, RAND Corporation, Stanford University, the University of Southern California/University of California at Los Angeles, and the University of Wisconsin.

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Center for Health and Well-Being Working Papers
http://weblamp.princeton.edu/chw/research/papers.php

Disease Control Priorities Project
www.dcp2.org

Global Demography of Aging
www.hsph.harvard.edu/pgda

Health Systems, Population Health, and Development in China and India
www.hsph.harvard.edu/pgda/seminars/workshopsIndia2006.htm

Summer Undergraduate Program in Population, Health, and Aging
www.acadweb.wwu.edu/eesp/summer/soc07.shtml