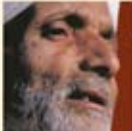


NATIONAL INSTITUTE ON AGING
NATIONAL INSTITUTES OF HEALTH
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

U.S. DEPARTMENT OF STATE

Why Population Aging Matters

A Global Perspective





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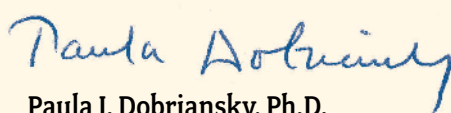
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Foreword >

People are living longer and, in some parts of the world, healthier lives. This represents one of the crowning achievements of the last century but also a significant challenge. Longer lives must be planned for. Societal aging may affect economic growth and many other issues, including the sustainability of families, the ability of states and communities to provide resources for older citizens, and international relations. The Global Burden of Disease, a study conducted by the World Health Organization and the World Bank, with partial support from the U.S. National Institute on Aging, predicts a very large increase in disability caused by increases in age-related chronic disease in all regions of the world. In a few decades, the loss of health and life worldwide will be greater from noncommunicable or chronic diseases (e.g., cardiovascular disease, dementia and Alzheimer's disease, cancer, arthritis, and diabetes) than from infectious diseases, childhood diseases, and accidents.

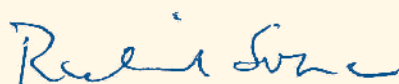
Despite the weight of scientific evidence, the significance of population aging and its global implications have yet to be fully appreciated. There is a need to raise awareness about not only global aging issues but also the importance of rigorous cross-national scientific research and policy dialogue that will help us address the challenges and opportunities of an aging world. Preparing financially for longer lives and finding ways to reduce aging-related disability should become national and global priorities. Experience shows that for nations, as for individuals, it is critical to address problems sooner rather than later. Waiting significantly increases the costs and difficulties of addressing these challenges.

This report paints a compelling picture of the impact of population aging on nations. It provides a succinct description of population trends that are transforming the world in fundamental ways. We hope this information will stimulate dialogue about biomedical, economic, and behavioral issues and encourage international study to determine the best ways to address this universal human experience. We trust that members of the global community will be inspired to share their recommendations and their experiences so that we can all plan for the aging of our world's population. We are, after all, planning for our own futures.



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OVERVIEW

Our Aging World

We are aging—not just as individuals or communities but as a world. In 2006, almost 500 million people worldwide were 65 and older. By 2030, that total is projected to increase to 1 billion—1 in every 8 of the earth’s inhabitants. Significantly, the most rapid increases in the 65-and-older population are occurring in developing countries, which will see a jump of 140 percent by 2030.

A Host of Challenges

While global aging represents a triumph of medical, social, and economic advances over disease, it also presents tremendous challenges. Population aging strains social insurance and pension systems and challenges existing models of social support. It affects economic growth, trade, migration, disease patterns and prevalence, and fundamental assumptions about growing older.

Using data from the United Nations, U.S. Census Bureau, and Statistical Office of the European Communities as well as regional surveys and scientific journals, the U.S. National Institute on Aging (NIA), with input from demographers, economists, and experts on aging, identified nine emerging trends in global aging. Together, these trends present a snapshot of challenges and opportunities that clearly show why population aging matters.

- The overall population is aging. For the first time in history, and probably for the rest of human history, people age 65 and over will outnumber children under age 5.
 - Life expectancy is increasing. Most countries, including developing countries, show a steady increase in longevity over time, which raises the question of how much further life expectancy will increase.
 - The number of oldest old is rising. People age 85 and over are now the fastest growing portion of many national populations.
 - Noncommunicable diseases are becoming a growing burden. Chronic noncommunicable diseases are now the major cause of death among older people in both more developed and less developed countries.
 - Some populations will shrink in the next few decades. While world population is aging at an unprecedented rate, the total population in some countries is simultaneously declining.
- Family structures are changing. As people live longer and have fewer children, family structures are transformed, leaving older people with fewer options for care.
 - Patterns of work and retirement are shifting. Shrinking ratios of workers to pensioners and people spending a larger portion of their lives in retirement increasingly strain existing health and pension systems.
 - Social insurance systems are evolving. As social insurance expenditures escalate, an increasing number of countries are evaluating the sustainability of these systems.
 - New economic challenges are emerging. Population aging will have dramatic effects on social entitlement programs, labor supply, trade, and savings around the globe and may demand new fiscal approaches to accommodate a changing world.

A Window of Opportunity

Some governments have begun to plan for the long term, but most have not. The window of opportunity for reform is closing fast as the pace of population aging accelerates. While Europe currently has four people of working age for every older person, it will have only two workers per older person by 2050. In some countries the share of gross domestic product devoted to social insurance for older people is expected to more than double in upcoming years. Countries therefore have only a few years to intensify efforts before demographic effects come to bear.

The challenges may seem daunting, but a host of opportunities await us as well. For instance, countries that have begun to address issues of population aging can share their experiences. There are exciting opportunities for economic expansion and cross-national collaboration as well, but we must act now or the costs of waiting—financial and social—will be overwhelming.



INTRODUCTION

The Cost of Waiting

Global aging is a success story. People today are living longer and generally healthier lives. This represents the triumph of public health, medical advancement, and economic development over disease and injury, which have constrained human life expectancy for thousands of years.

But sustained growth of the world's older population also presents challenges. Population aging now affects economic growth, formal and informal social support systems, and the ability of states and communities to provide resources for older citizens. Nations must quickly recognize the scope of the new demographic reality and adjust current policies accordingly. Experience has shown that such adjustments may be painful—changes in retirement ages and medical benefits, for example, are not widely popular. But experience also shows that it is easier to address problems sooner rather than later, when the cost of waiting may become insurmountable.

We can think about preparing for older age on both an individual and societal level. On an individual level, people need to focus on preventive health and financial preparedness. We know that many individuals approach older age with little or no savings. A simple example illustrates the financial cost of waiting to save and the value of a more farsighted perspective. A 40-year-old worker who begins to save \$10,000 per year will accumulate \$700,000 by the time he is 70 years old, assuming an interest rate of 5 percent per year. If he had begun saving when he was 30 years old, he would only have needed to save \$5,500 per year to accumulate the same amount by age 70.

Calculating the cost of waiting at the national level is much more complex, but similar reasoning applies. Just as for individuals, small and gradual changes distributed over a longer time horizon are more easily absorbed by a country than sudden and more substantial actions required to meet a particular savings target over a shorter time horizon. Countries and international organizations are now developing detailed models in recognition of looming costs and the need for pension reforms to ensure sustainable old-age support. In 2006, the



European Commission and the Economic Policy Committee submitted a report to European Finance Ministers with new projections of economic and budgetary costs for European Union (EU) member states. While Europe currently has four people of working age for every older citizen, it will have only two workers per older citizen by 2050 as a result of the baby boom generation retiring and life expectancy increasing. Given current policies, the pension, health, and long-term care costs associated with an aging population will lead to significant increases in public spending in most member states over the next half century. Gross domestic product growth rates are projected to fall across the EU, and in the absence of policy changes, the potential EU economic growth rate will be cut in half by 2030.

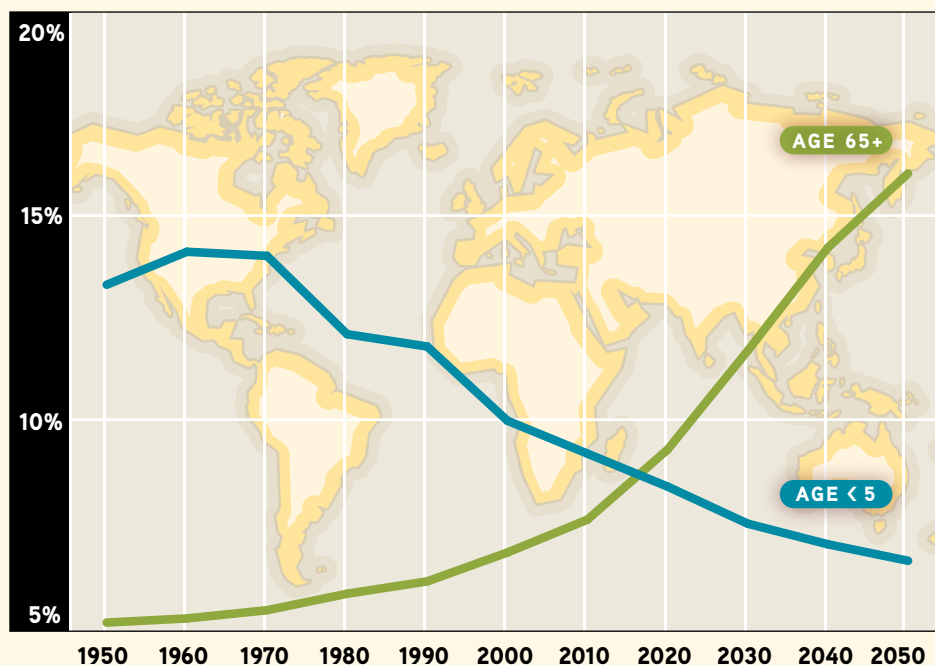
While some countries have initiated changes in retirement age that promise to ease the burden of public spending, the EU analysis emphasizes that such changes alone are inadequate. During the next few years, countries must exploit a fast-closing window of opportunity to intensify reform before demographic effects come to bear. The EU report notes that, similar to the impact of an individual worker delaying savings, delays at the national level will increase the costs of adjustment and shift an enormous economic burden to the next generation of workers and taxpayers.

An Aging Population

Since the beginning of recorded human history, young children have outnumbered older people. Very soon this will change. For the first time in history, people age 65 and over will outnumber children under age 5 (Figure 1). This trend is emerging around the globe. Today almost 500 million people are age 65 and over, accounting for 8 percent of the world's population.

Figure 1:

YOUNG CHILDREN AND OLDER PEOPLE AS A PERCENTAGE OF GLOBAL POPULATION



Source: United Nations Department of Economic and Social Affairs, Population Division. *World Population Prospects. The 2004 Revision*. New York: United Nations, 2005.

By 2030 the world is likely to have 1 billion older people, accounting for 13 percent of the total population. While today's proportions of older people typically are highest in more developed countries, the most rapid increases in older populations are occurring in the less developed world. Between 2006 and 2030, the number of older people in less developed countries is projected to increase by 140 percent as compared to an increase of 51 percent in more developed countries.

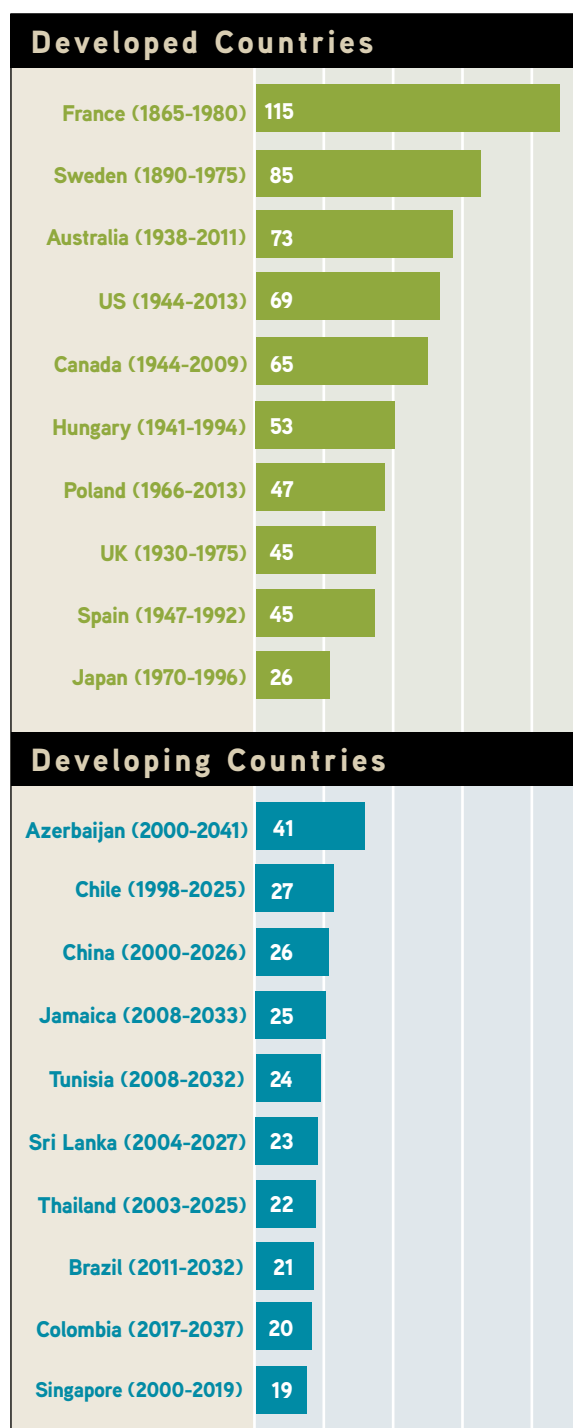
Population aging is driven by declines in fertility and improvements in health and longevity. In more developed countries, declines in fertility that began in the early 1900s have resulted in current fertility levels below the population replacement rate of two live births per woman. Perhaps the most surprising demographic development of the past 20 years has been the pace of fertility decline in many less developed countries. In 2006, for example, the total fertility rate was at or below the replacement rate in 44 less developed countries.

Most of the more developed nations have had decades to adjust to this change in age structure (Figure 2). For example, it took more than a century for France's population age 65 and over to increase from 7 to 14 percent of the total population. In contrast, many less developed countries are experiencing rapid increases in the number and percentage of older people, often within a single generation. The same demographic aging process that unfolded over more than a century in France will occur in two decades in Brazil. In response to this "compression of aging," institutions must adapt quickly to accommodate a new age structure. Some less developed nations will be forced to confront issues, such as social support and the allocation of resources across generations, without the accompanying economic growth that characterized the experience of aging societies in the West. In other words, some countries may grow old before they grow rich.

Figure 2:

THE SPEED OF POPULATION AGING

Number of years for population age 65+ to increase from 7% to 14%



Source: Kinsella K, Gist Y. *Older Workers, Retirement, and Pensions. A Comparative International Chartbook*. Washington, DC: U.S. Census Bureau and U.S. National Institute on Aging, 1995; and U.S. Census Bureau. International Data Base. Available at: <http://www.census.gov/ipc/www/idbnew.html>. Accessed January 8, 2007.

Increasing Life Expectancy

Some nations experienced more than a doubling of average life expectancy during the 20th century. Life expectancy at birth in Japan now approaches 82 years, the highest level among the world's more developed countries, and life expectancy is at least 79 years in several other more developed countries.



Less developed regions of the world have experienced a steady increase in life expectancy since World War II, with some exceptions in Latin America and more recently in Africa, the latter due to the impact of the HIV/AIDS epidemic. The most dramatic gains have occurred in East Asia, where life expectancy at birth increased from less than 45 years in 1950 to more than 72 years today.

Changes in life expectancy reflect a health transition occurring around the globe at different rates and along different paths. This transition is characterized by a broad set of changes that includes:

- A shift from high to low fertility;
- A steady increase in life expectancy at birth and at older ages; and

- A shift from the predominance of infectious and parasitic diseases to the growing impact of noncommunicable diseases and chronic conditions.

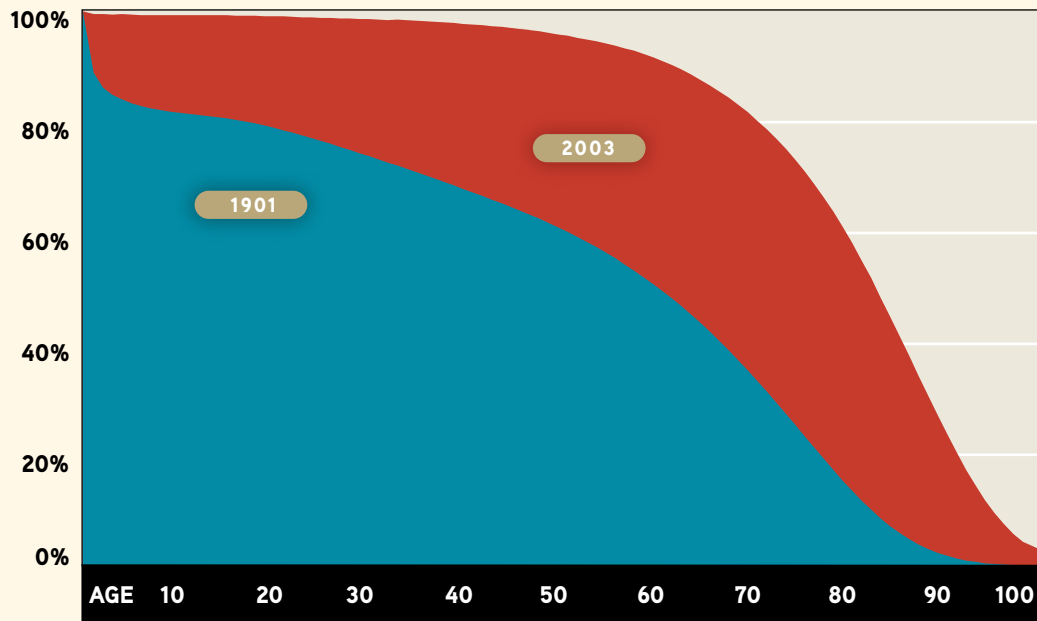
The health transition shifts the human survival curve so that the chances of surviving another year are higher at every age. In early nonindustrial societies, the risk of death was high at every age, and only a small proportion of people reached old age. In modern survival curves for industrialized societies, most people live past middle age, and deaths are highly concentrated at older ages.

Figure 3 depicts the evolution of survival for White females in the United States from 1901 to 2003. In most countries, the curve shifts to the right as longevity increases.

Increases in the probability of survival raise questions about limits to life expectancy and the potential for human lifespan. Despite assertions that life expectancy must be approaching a limit, data on female life expectancies from 1840 to 2000 show a steady increase of 3 months per year (**Figure 4**). The country with the highest average life expectancy has varied over time—in 1840 it was Sweden, and today it is Japan—but the

Figure 3:

WHITE FEMALE SURVIVAL IN THE UNITED STATES: 1901 AND 2003



Source: Glover J. *United States Life Tables, 1890, 1901, 1910, and 1901-1910*. Washington: Bureau of the Census, 1921. Available at: <http://www.cdc.gov/nchs/data/lifetables/life1890-1910.pdf>; and Arias E. *United States Life Tables, 2003*. National Vital Statistics Report: 2006;54(14):1-40. Available at: http://www.cdc.gov/nchs/data/nvsr/nvsr54/nvsr54_14.pdf.

linearity of the pattern (also seen for males) is remarkable. While HIV/AIDS, obesity, and similar trends may temper expectations for continued increases in longevity, several findings encourage a more optimistic outlook. These include:

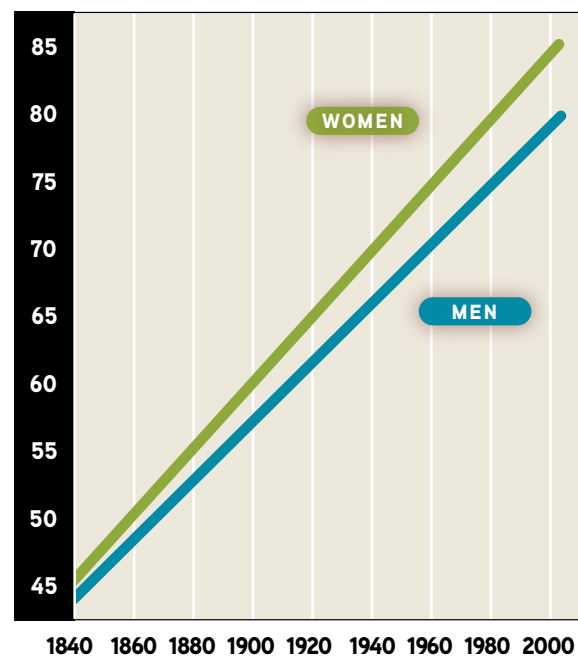
- Studies showing that death rates at very old ages level off or decline;
- The explosion in the number of centenarians worldwide;
- The finding that, even at older ages, mortality rates are malleable and amenable to social interventions; and
- Evidence that medical advances and new drugs are increasing life expectancy.

Recent research raises other questions about the future of life. Researchers have been able to experimentally increase lifespan in insects and animals through gene insertion, caloric restriction, and diet. It remains to be seen whether similar increases can be replicated in humans.

Figure 4:

HIGHEST NATIONAL LIFE EXPECTANCY AT BIRTH: 1840–2000

Life expectancy in years



Source: Adapted from Oeppen J, Vaupel JW. Broken Limits to Life Expectancy. *Science*. 2002;296:1029-1031.

Rising Numbers of the Oldest Old

An important feature of population aging is the progressive aging of the older population itself. Over time, more older people survive to even more advanced ages. For research and policy purposes, it is useful to distinguish between the old and the oldest old, often defined as people age 85 and over. Because of chronic disease, the oldest old have the highest population levels of disability that require long-term care. They consume public resources disproportionately as well.

The growth of the oldest old population has a number of implications:

- Pensions and retirement income will need to cover a longer period of life.
- Health care costs will rise even if disability rates decline somewhat.
- Intergenerational relationships will take on an added dimension as the number of grandparents and great-grandparents increase.
- The number of centenarians will grow significantly for the first time in history. This will likely yield clues about individual and societal aging that redefine the concept of oldest old.

The oldest old constitute 7 percent of the world's 65-and-over population: 10 percent in more developed countries and 5 percent in less developed countries. More than half of the world's oldest old live in six countries: China, the United States, India, Japan,



Germany, and Russia. In many countries, the oldest old are now the fastest growing portion of the total population. On a global level, the 85-and-over population is projected to increase 151 percent between 2005 and 2030, compared to a 104-percent increase for the population age 65 and over and a 21-percent increase for the population under age 65 (Figure 5). Past population projections often underestimated

decreases in mortality rates among the oldest old; therefore, the number of tomorrow's oldest old may be significantly higher than anticipated.

The percentage of oldest old will vary considerably from country to country. In the United States, for example, the oldest old accounted for 14 percent of all older people in 2005. By 2030, this percentage is unlikely to change because the aging baby boom generation will continue to enter the ranks of the 65-and-over population. In Europe, some countries will experience a sustained rise in their share of oldest old while others will see an increase during the next two decades and then a subsequent decline. The most striking increase will occur in Japan: By 2030, nearly 24 percent of all older Japanese are expected to be at least 85 years old. Most less developed countries should experience modest long-term increases in their 85-and-over population.

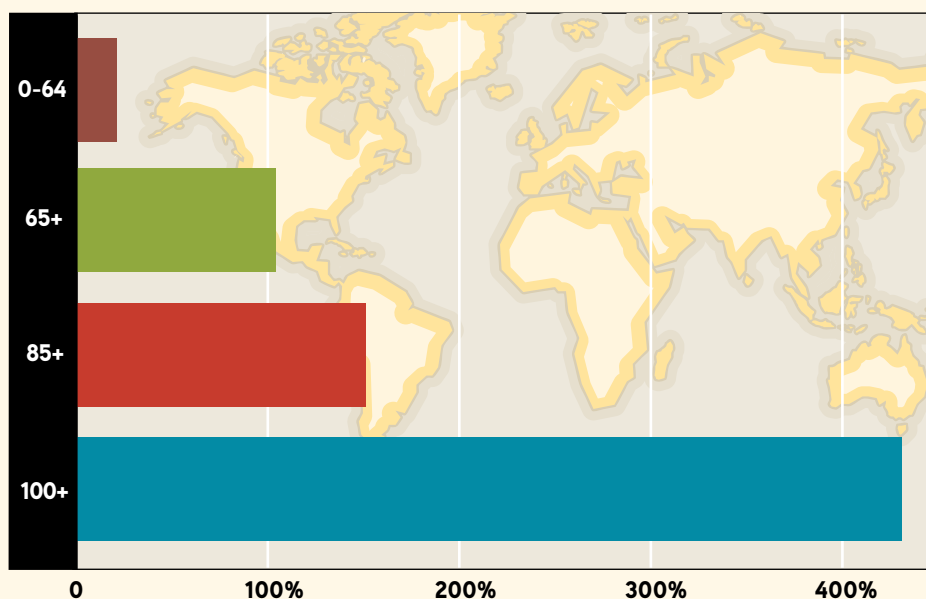
As life expectancy increases and the oldest old increase in number, four-generation families

become more common. The aging of the baby boom generation, for example, is likely to produce a great-grandparent boom. As a result, some working adults will feel the financial and emotional pressures of supporting both their children and older parents and possibly grandparents simultaneously.

While people of extreme old age—that is, centenarians—constitute a small portion of the total population in most countries, their numbers are growing. The estimated number of people age 100 and over has doubled each decade since 1950 in more developed countries. In addition, the global number of centenarians is projected to more than quintuple between 2005 and 2030 (Figure 5). Some researchers estimate that, over the course of human history, the odds of living from birth to age 100 may have risen from 1 in 20 million to 1 in 50 for females in low-mortality nations such as Japan and Sweden.

Figure 5:

PROJECTED INCREASE IN GLOBAL POPULATION BETWEEN 2005 AND 2030, BY AGE



Source: United Nations Department of Economic and Social Affairs, Population Division. *World Population Prospects. The 2004 Revision*. New York: United Nations, 2005.

Growing Burden of Noncommunicable Diseases

In the next 10 to 15 years, the loss of health and life in every region of the world, including Africa, will be greater from noncommunicable or chronic diseases, such as heart disease, cancer, and diabetes, than from infectious and parasitic diseases. This represents a shift in disease epidemiology that has become the focus of increasing attention in light of global aging.



The myth that noncommunicable diseases are diseases of affluence is dispelled by the results of the Global Burden of Disease project, which combines information about mortality and morbidity to assess the total loss of healthy years of life due to disease and injury. In 2002, the project estimates, noncommunicable diseases accounted for 85 percent of the burden of disease in high-income countries and a surprising 44 percent of the burden of disease in low- and middle-income countries. Noncommunicable

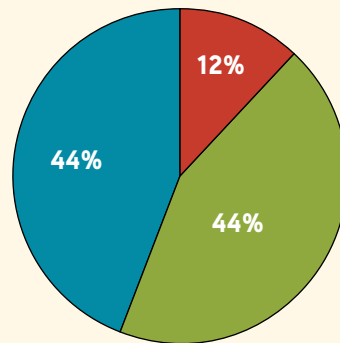
diseases already account for as much of the burden of disease in low- and middle-income countries as all communicable diseases, maternal and perinatal conditions, and nutritional conditions. By 2030, according to projections, the share of the burden attributed to noncommunicable diseases in low- and middle-income countries will reach 54 percent while the share attributed to communicable diseases will fall to 32 percent (Figure 6). If we restrict attention to older ages, noncommunicable diseases already account for more than 87 percent of the burden for the over-60 population in low-, middle-, and high-income countries. The critical issue for low- and middle-income countries is how to mobilize and allocate resources to address noncommunicable diseases as they continue to struggle with the high prevalence of communicable diseases.

There is extensive debate about the relationship between increased life expectancy and disability status. The central question is: Are we living healthier as well as longer lives, or are our additional years spent in poor health? Some researchers posit

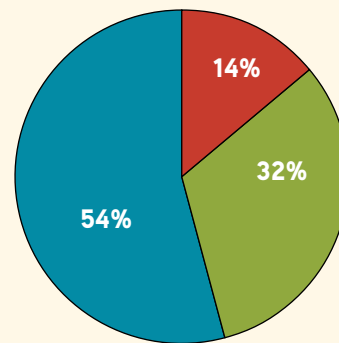
Figure 6:

THE INCREASING BURDEN OF CHRONIC NONCOMMUNICABLE DISEASES: 2002–2030

Low- and Middle-Income Countries

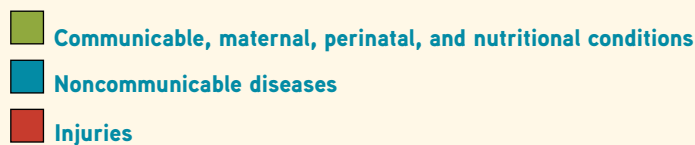
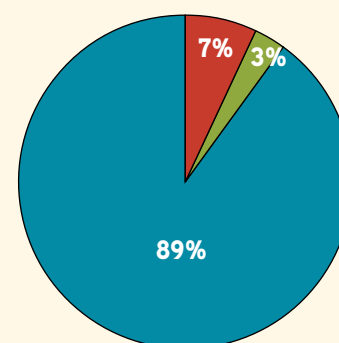
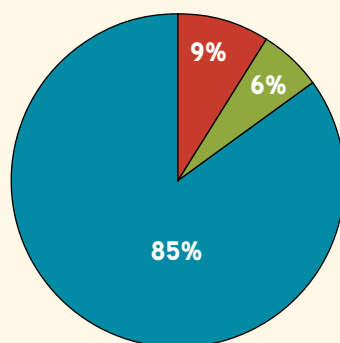


2002



2030

High-Income Countries



Source: Lopez AD, Mathers CD, Ezzati M, Jamison DT, Murray CJL, eds. *Global Burden of Disease and Risk Factors*. Washington, DC: The World Bank Group, 2006.

a “compression of morbidity”—a decrease in the prevalence of disability as life expectancy increases. Others contend an “expansion of morbidity”—an increase in the prevalence of disability as life expectancy increases. Yet others argue that, as advances in medicine slow the progression from chronic disease to disability, there is a decrease in the prevalence of severe disability but an increase in milder chronic diseases.

A significant reduction in disability has accompanied the increase in longevity in the United States. However, a recent NIA-sponsored analysis across the Organisation for Economic Cooperation

and Development (OECD) member countries documents three patterns of disability trends among older people over the past 5 to 10 years:

- A reduction in severe disability rates in Denmark, Finland, Italy, The Netherlands, and the United States;
- Stable rates, even as the population has aged, in Australia, Canada, and France; and
- An increase in severe disability rates in Belgium, Japan, and Sweden.

There is a great need for cross-national efforts to monitor these trends and understand the causes.

Aging and Population Decline

While the global population is aging at an unprecedented rate, some countries are witnessing an historically unprecedented demographic phenomenon: Simultaneous population aging and population decline.

More than 20 countries are projected to experience population declines in the upcoming decades. Russia's population, for example, is expected to shrink by 18 million between 2006 and 2030, a decrease of nearly 13 percent. Nine other countries are projected to experience a decline of at least 1 million people during the same period (Figure 7).

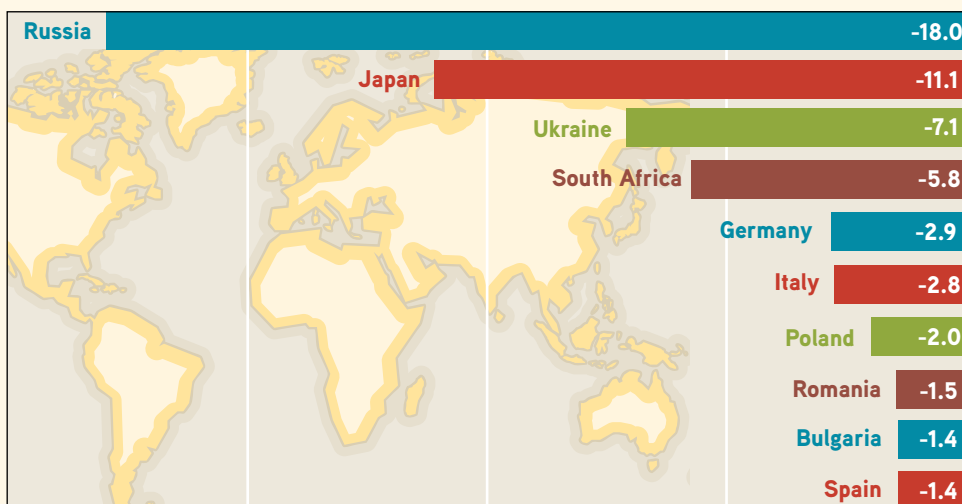
While Japan's total population is projected to decrease by 11 million, the population age 65 and

over is projected to increase by 8 million between 2006 and 2030. The proportion of older people in Japan should therefore grow from 20 percent in 2006 to about 30 percent in 2030.

Population declines in more developed countries are primarily the result of low fertility. Russia and Japan, for instance, have total fertility rates of 1.4 births per woman, significantly below the rate needed to replenish a population

Figure 7:

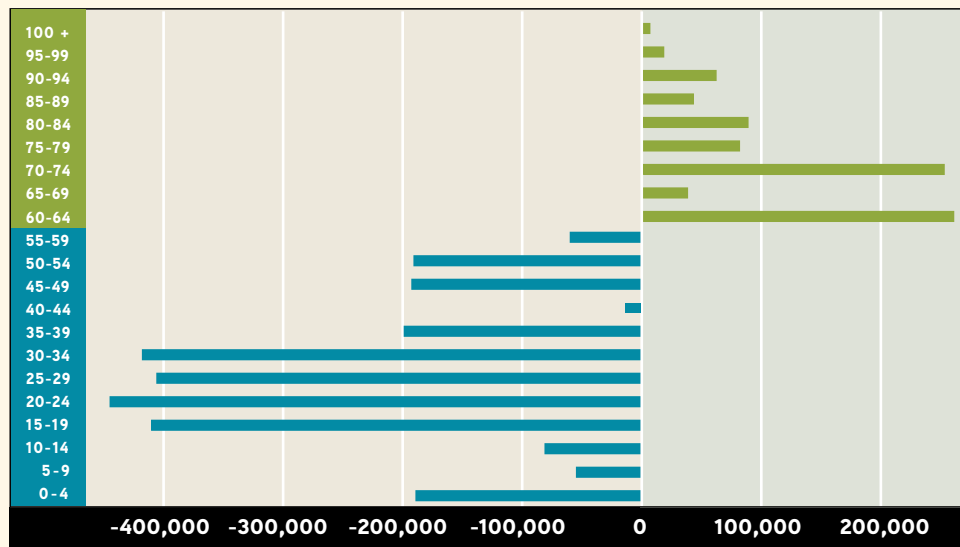
PROJECTED POPULATION DECLINE BETWEEN 2006 AND 2030 (IN MILLIONS)



Source: U.S. Census Bureau International Data Base. Available at: <http://www.census.gov/ipc/www/idbnew.html>. Accessed January 8, 2007.

Figure 8:

PROJECTED AGE-SPECIFIC POPULATION CHANGE BETWEEN 2006 AND 2030 IN RUSSIA



Source: U.S. Census Bureau International Data Base, Available at: <http://www.census.gov/ipc/www/idbnew.html>. Accessed January 8, 2007.

in the absence of migration. In contrast, less developed countries facing population declines are experiencing increased mortality largely due to HIV/AIDS. Life expectancy in South Africa fell from 60 years in 1996 to 43 years in 2006, and current projections suggest that South Africa could lose nearly 6 million people between 2006 and 2030. Clearly, reversing the trend toward population decline in South Africa and other affected nations will depend on the pace of innovations targeting HIV/AIDS, particularly with regard to the efficacy of antiretroviral drug regimes.

In the face of overall population decline, officials and policy planners must be especially attentive to age-specific changes within populations. In Russia, for example, the population under age 60 is likely to decrease in size between 2006 and 2030 as the size of older age groups increases (Figure 8). It therefore appears likely that the demand for health care services in Russia will outweigh the need to build more

schools. Most notable is the large decline in the number of younger adults of working age. The working-age population, which contributes to economic growth and the pension system, is shrinking at the same time that the older, nonworking population is increasing. As a result, economic expansion could be hampered as businesses struggle to attract new workers.

This shift in age structure is seen in many of the more developed countries, including those that are not expected to face population declines in the near future. Both France and the United Kingdom, for example, will experience population increases between 2006 and 2030; nevertheless, their age structure is expected to shift much like Russia's with nonworkers outnumbering workers. These changes have many implications for the development and funding of social programs, including those addressing potentially contentious issues such as fertility and international migration.

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