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

U.S. DEPARTMENT OF STATE

Why Population Aging Matters

A Global Perspective

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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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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.

TREND

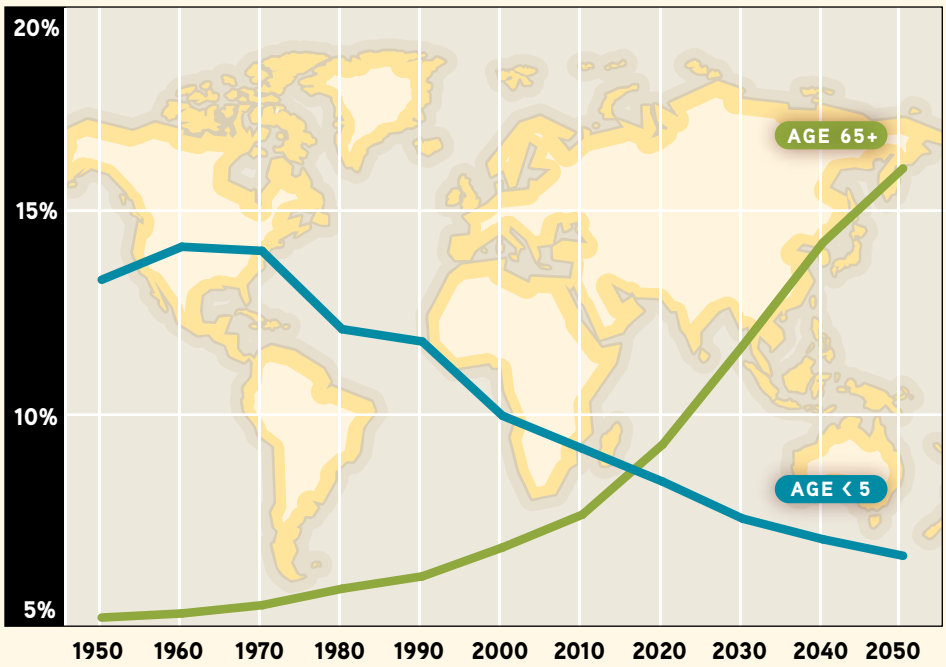
1

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.

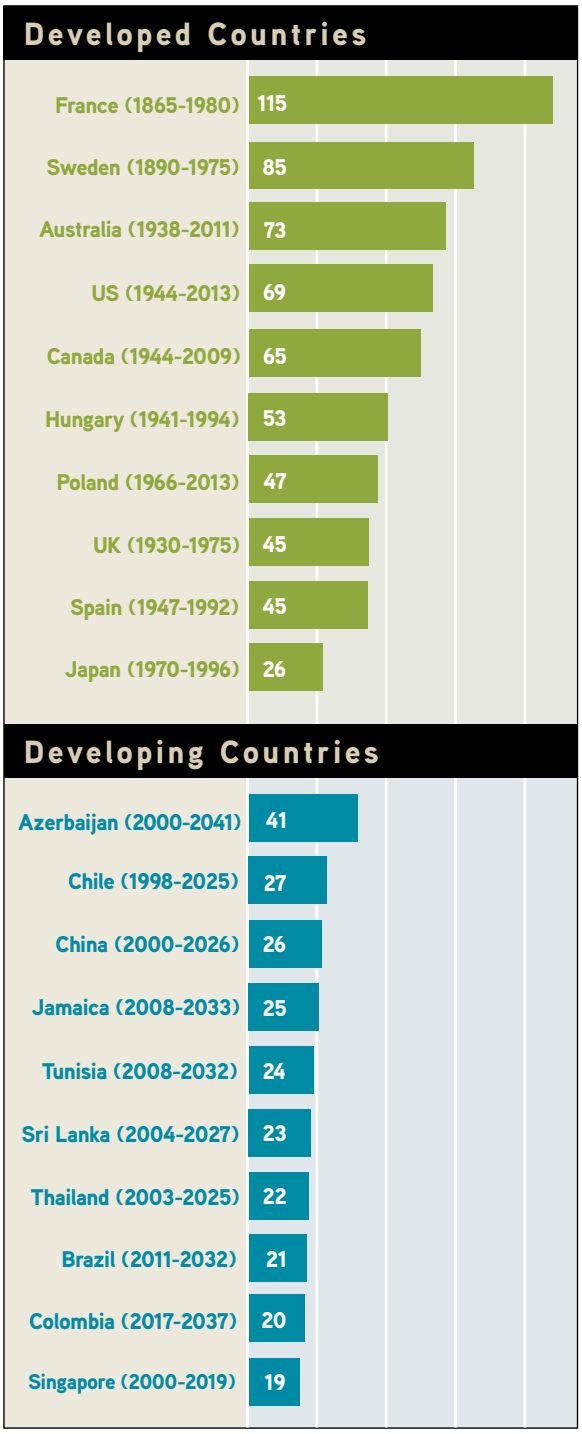
Population aging is driven by declines in fertility and improvements in health and longevity. In more developed countries, declines in fertility that began in the early 1900s have resulted in current fertility levels below the population replacement rate of two live births per woman. Perhaps the most 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.

TREND

2 *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:

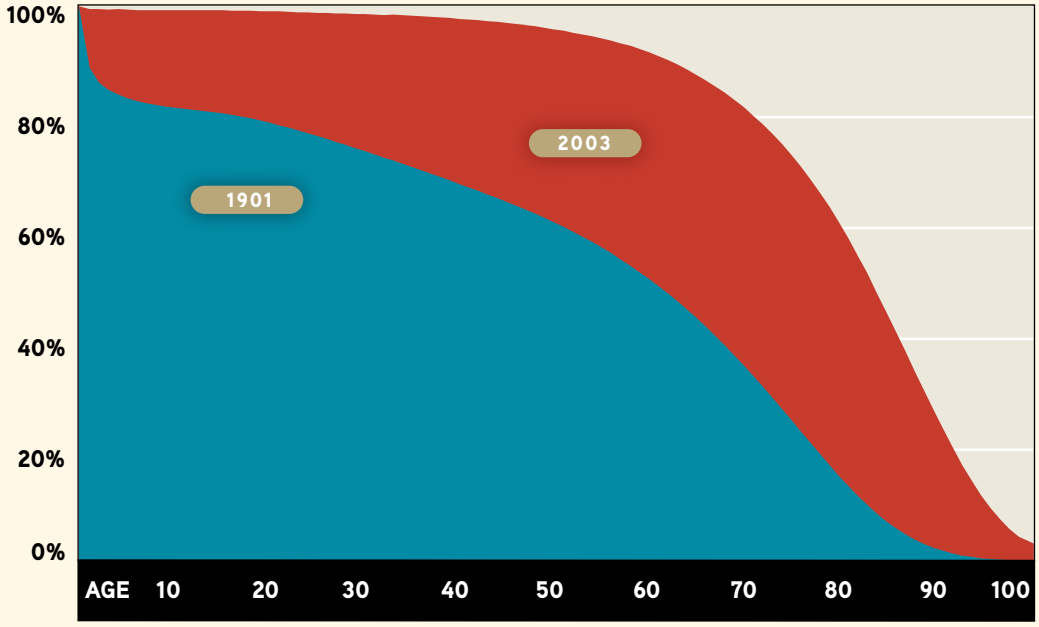
- A shift from high to low fertility;
- A steady increase in life expectancy at birth and at older ages; and
- A shift from the predominance of infectious and parasitic diseases to the growing impact of noncommunicable diseases and chronic conditions.

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:

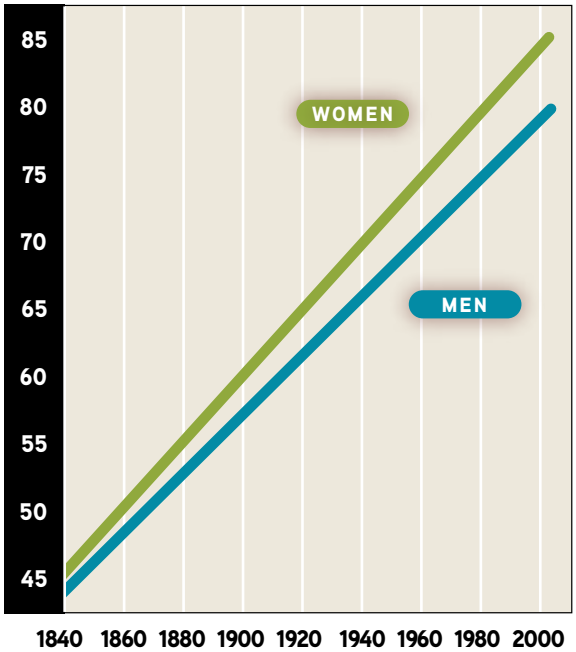
- Studies showing that death rates at very old ages level off or decline;
- The explosion in the number of centenarians worldwide;
- The finding that, even at older ages, mortality rates are malleable and amenable to social interventions; and
- Evidence that medical advances and new drugs are increasing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

TREND

3

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.

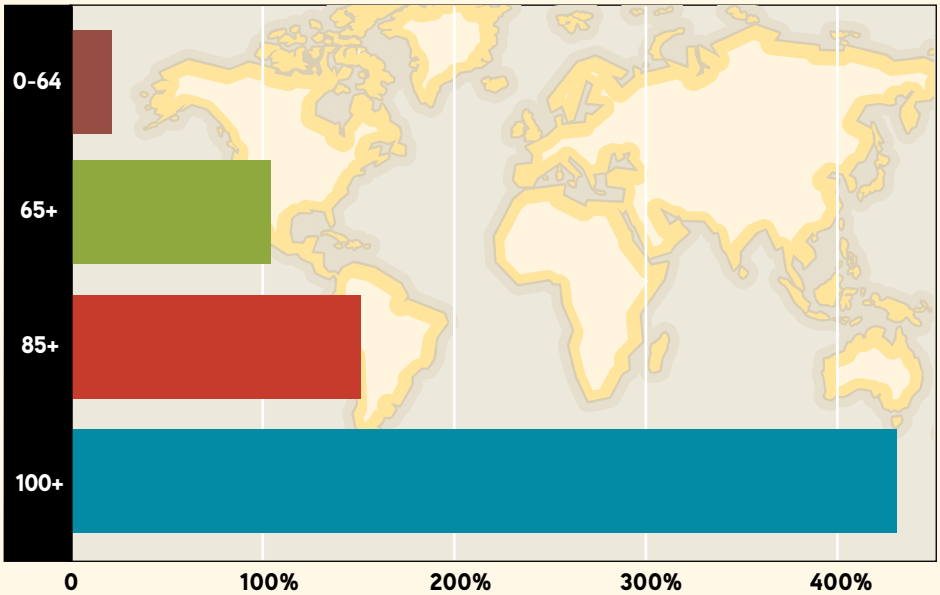
The percentage of oldest old will vary considerably from country to country. In the United States, for example, the oldest old accounted for 14 percent of all older people in 2005. By 2030, this percentage is unlikely to change because the aging baby boom generation will continue to enter the ranks of 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.

TREND

4

Growing Burden of Noncommunicable Diseases

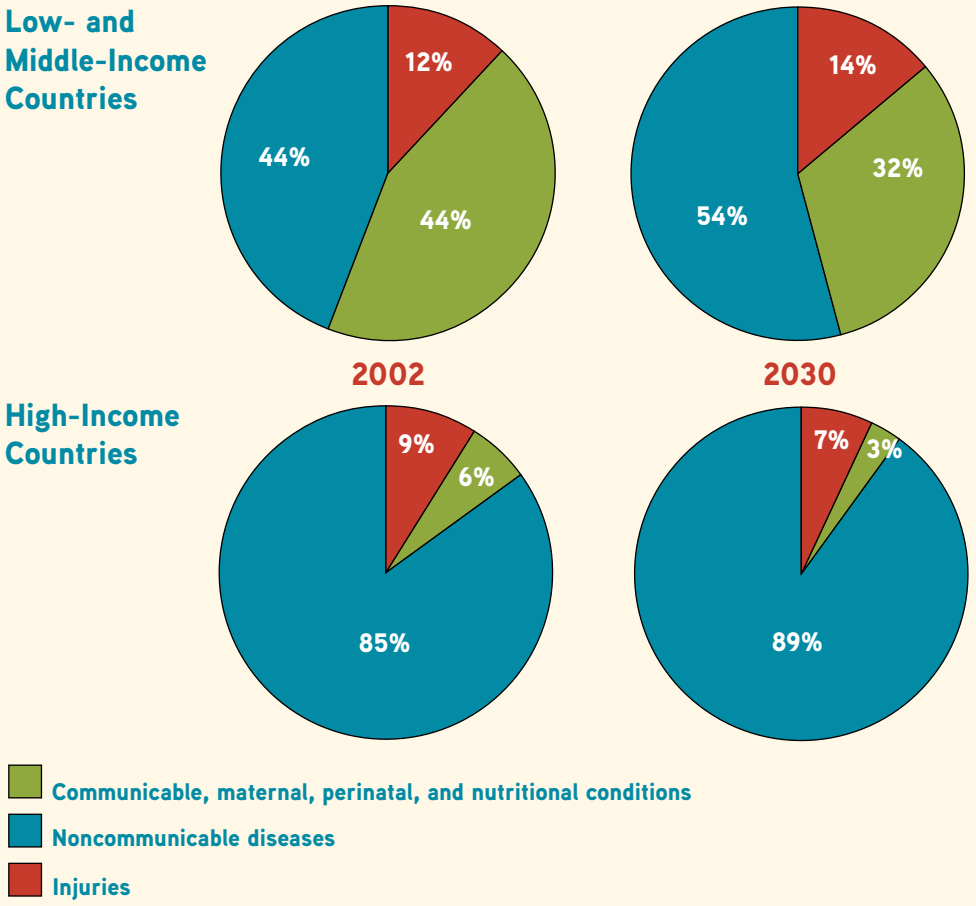
In the next 10 to 15 years, the loss of health and life in every region of the world, including Africa, will be greater from noncommunicable or chronic diseases, such as heart disease, cancer, and diabetes, than from infectious and parasitic diseases. This represents a shift in disease epidemiology that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



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.

TREND

5

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.

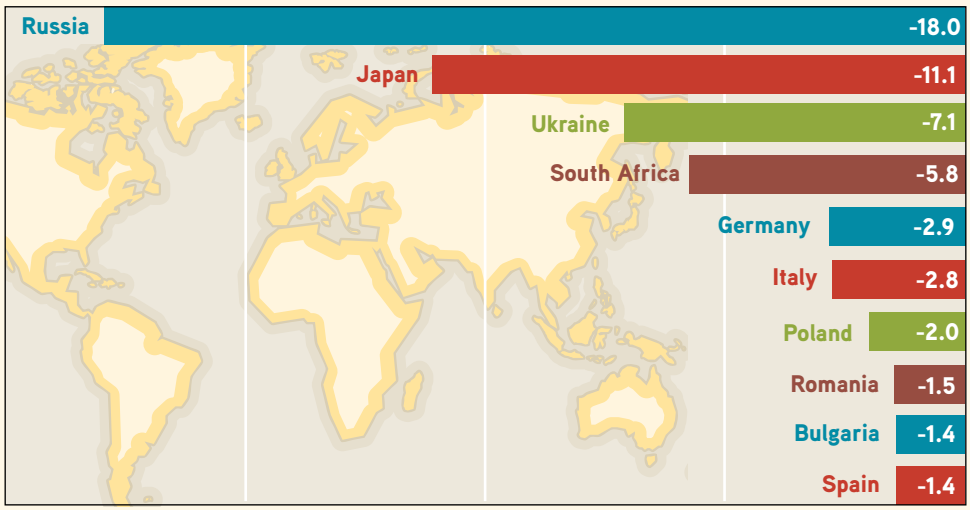
More than 20 countries are projected to experience population declines in the upcoming decades. Russia's population, for example, is expected to shrink by 18 million between 2006 and 2030, a decrease of nearly 13 percent. Nine other countries are projected to experience a decline of at least 1 million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

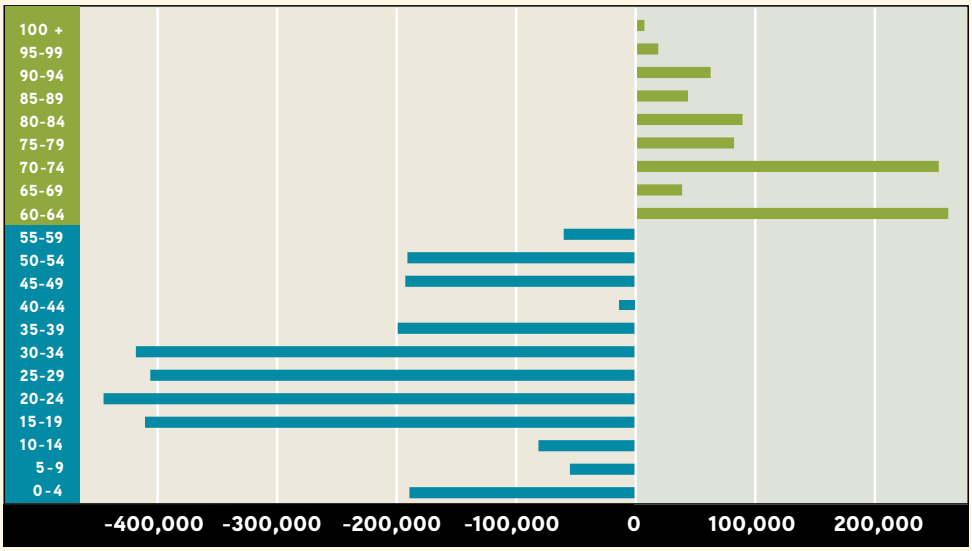
PROJECTED POPULATION DECLINE BETWEEN 2006 AND 2030 (IN MILLIONS)



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.

TREND 6

Changing Family Structure

As people live longer and have fewer children, family structures are transformed. This has important implications in terms of providing care to older people.

Most older people today have children, and many have grandchildren and siblings. However, in countries with very low birth rates, future generations will have few if any siblings. As a result of this trend and the global trend toward having fewer children, people will have less familial care and support as they age.

As life expectancy increases in most nations, so do the odds of different generations within a family coexisting. In more developed countries, this has manifested itself as the "beanpole family," a vertical extension of family structure characterized by an increase in the number of living generations within a lineage and a decrease in the number of people within each generation. As mortality rates continue to improve, more people in their 50s and 60s likely will have surviving parents, aunts, and uncles. Consequently, more children will know their grandparents and even their great-grandparents, especially their great-grandmothers. There is no historical precedent for a majority of middle-aged and older adults having living parents.

While the picture of the nuclear or extended family that stays together through life is still the norm in most nations, it is changing in many countries around the world. Among baby boom generations in the West, the family unit may take a variety of shapes. This reflects higher rates of divorce, remarriage, blended and step-family relations, and adults who have never married or are voluntarily childless. Further, many couples and single mothers delay childbearing until their 30s and 40s, households increasingly have both adults working, and more children are being raised in single-parent households.

People currently divorced constitute a small proportion of older populations. This will soon change in many countries as younger populations with higher rates of divorce and separation age. In the United States, for example, 9 percent of the 65-and-over population is divorced or separated compared to 17 percent of people age 55 to 64 and 18 percent of people age 45 to 54. This trend has gender-specific implications: Nonmarried women are less likely than nonmarried men to have accumulated assets and pension wealth for use in older age, and older men are less likely to form and maintain supportive social networks.

Childlessness is another important factor that will affect caregiving but has received relatively scant attention. In modern societies, around 20 percent of women do not give birth. Rising percentages of childless women are seen in Europe and North America and, increasingly, in Latin America and Southeast Asia as well. Research among European adults age 18 to 39 shows that, in some countries, more than one-third either intend to remain childless or are uncertain about remaining childless. Given the variation in family structure worldwide, it will be increasingly important to distinguish

between the various reasons for childlessness—voluntary, involuntary coerced, involuntary natural, or loss of children due to HIV/AIDS. Each has different implications for care arrangements as middle-aged women reach older age.

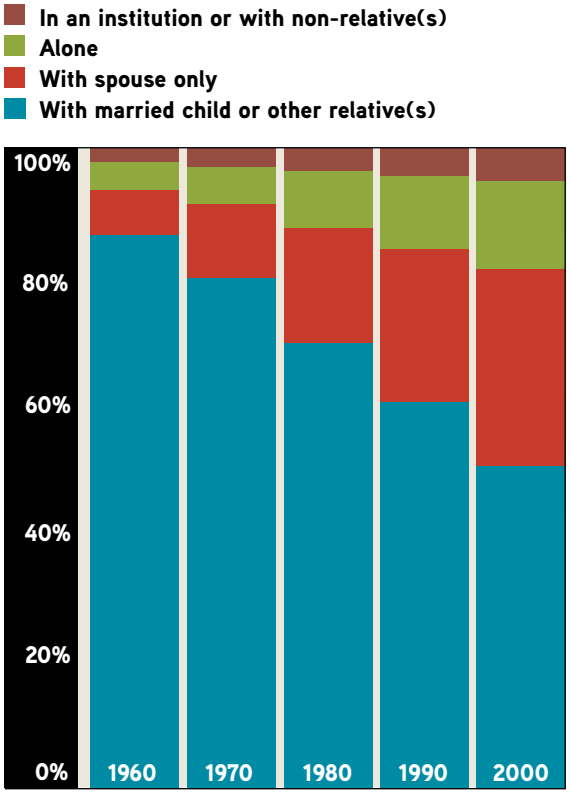
Older people's living arrangements reflect their need for family, community, or institutional support. Living arrangements also indicate sociocultural preferences—for example, some choose to live in nuclear households while others prefer extended families. The number, and often the percentage, of older people living alone is rising in most countries. In some European countries, more than 40 percent of women age 65 and older live alone. Even in societies with strong traditions of older parents living with children, such as in Japan, traditional living arrangements are becoming less common **(Figure 9).** In the past, living alone in older age often was equated with social isolation or family abandonment. However, research in many cultural settings shows that older people, even those living alone, prefer to be in their own homes and communities. This preference is reinforced by greater longevity, expanded social benefits, increased home ownership, elder-friendly housing, and an emphasis in many nations on community care.

While multigeneration households are dwindling in the more developed world, two- and three-generation households are still the norm in most less developed countries. Despite the apparent robustness of such living arrangements for older people, concerns are emerging. For example, unmarried women or widows without children can have little support and nowhere to live if extended family will not take them in. Further, changes in household structures occurring in the face of large numbers of AIDS deaths in parts of Africa and Asia may leave many orphans living with and supported by grandparents. There also are broader concerns related to young adult migration to urban areas, levels of intrafamily remittances, and return migration of adults after extended periods of employment in other countries.

Long-term care for older people has become a key issue in the West and also in many less developed, middle-income nations. Such care involves a range of support mechanisms such as home nursing, community care and assisted living, residential care, and long-stay hospitals. While the cost of long-term care is a burden to families and society, there are other concerns as well. For example, the staffing needs of caring for aging populations have increased the migration of health workers from lower income to higher income nations. Clearly, it is not premature to talk about the globalization of support for older persons.

Figure 9:

LIVING ARRANGEMENTS OF PEOPLE AGE 65 AND OVER IN JAPAN: 1960–2000



Source: National Institute of Population and Social Security Research. *Population Statistics of Japan 2003.* Available at: http://www.ipss.go.jp/index-e.html. Accessed January 18, 2007.

TREND 7

Shifting Patterns of Work and Retirement

No set of issues has stimulated public discourse about population aging more than work, retirement, and economic security in old age. In Western democracies, in Eastern Europe's transitional economies, and in much of the less developed world, policymakers struggle with the balance between public and private income security systems.

The precariousness of security in old age can be seen in stagnant and declining real pensions in transitional economies, in the fate of pensioners during the collapse of Argentina's economy in 2001, in the high poverty rates among Japanese elderly, and perhaps most vividly in the lack of formal social safety nets for most older people in Africa and Asia.

A prominent economic concern in our aging world is the shrinking of the workforce relative to the number of pensioners. Typically, this ratio declines as people live longer and as their participation in the workforce falls. From the 1950s to the mid-1980s, workforce participation rates for older men declined in most of the more developed countries. But beginning in the 1990s, this trend reversed. Among women in more developed countries, there has been a steady increase in workforce participation at older ages for the past two decades **(Figure 10).** Although data on less developed countries are inconsistent, the most common picture shows workforce participation rates decreasing for older men and increasing for older women. The latter trend will have important implications for the ability of women to accumulate and control economic resources in older age.

One central issue for policymakers in regard to pension funds is the relationship between the official (statutory) retirement age and actual retirement age (the average age at which retirement benefits are awarded). Over several decades in the latter 20th century, many of the more developed nations lowered the official age at which people become fully entitled to

public pension benefits. This was propelled by general economic conditions, changes in welfare philosophy, and private pension trends. Despite the recent trend toward increased workforce participation at older ages, a significant gap between official and actual ages of retirement persists. This trend is emerging in rapidly aging developing countries as well. In Taiwan, for example, the average actual retirement age dropped below 55 in 2004, the lowest level on record.

Just as the tendency to work at older ages varies from country to country, so do the routes workers take to retirement. These routes may involve working part time, leaving career jobs for transition jobs, or leaving the workforce because of disability. In South Korea, the average worker leaves company employment at age 54 but then engages in part-time or low-wage employment for another 14 years before retiring completely at age 68.

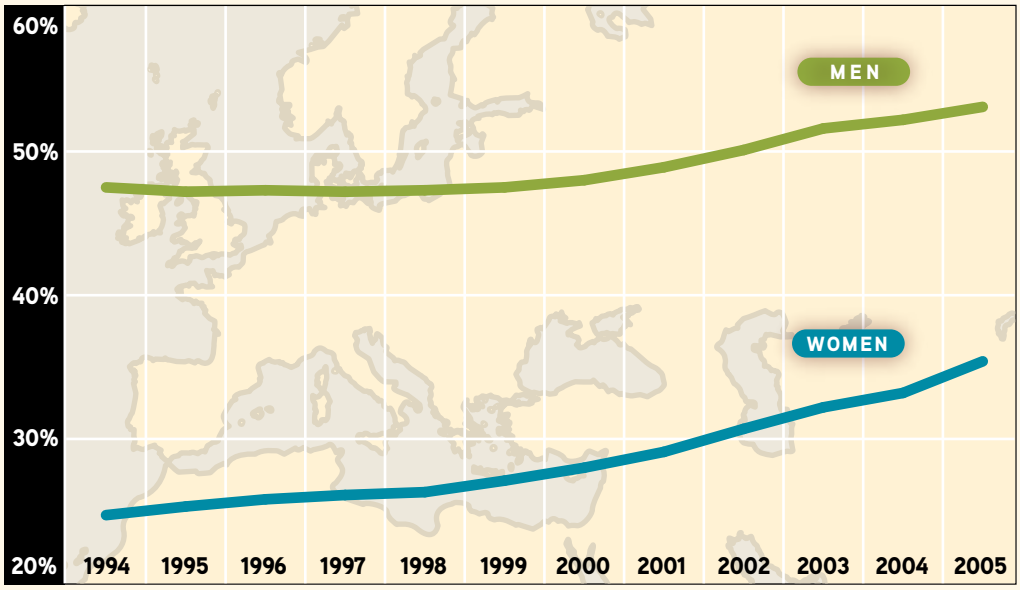
As life expectancy has increased through the 20th century, retirement ages have decreased. Consequently, people are spending more time in retirement. The OECD, using data from 15 member countries, divided the lifespan into four periods:

- Years before entry into the workforce (primarily spent in school)
- Years not working due to unemployment or economic inactivity
- Years in the workforce
- Years in retirement

In 1960, men on average could expect to spend 46 years in the workforce and a little more than one year in retirement. By 1995, the number of years in the workforce had decreased to 37 while the number of years in retirement had jumped to 12.

Figure 10:

EUROPEAN UNION EMPLOYMENT RATE, AGES 55-64: 1994–2005 (15-COUNTRY AGGREGATE)



Source: European Statistical System (EUROSTAT). Available at: http://epp.eurostat.ec.europa.eu. Accessed January 8, 2007.

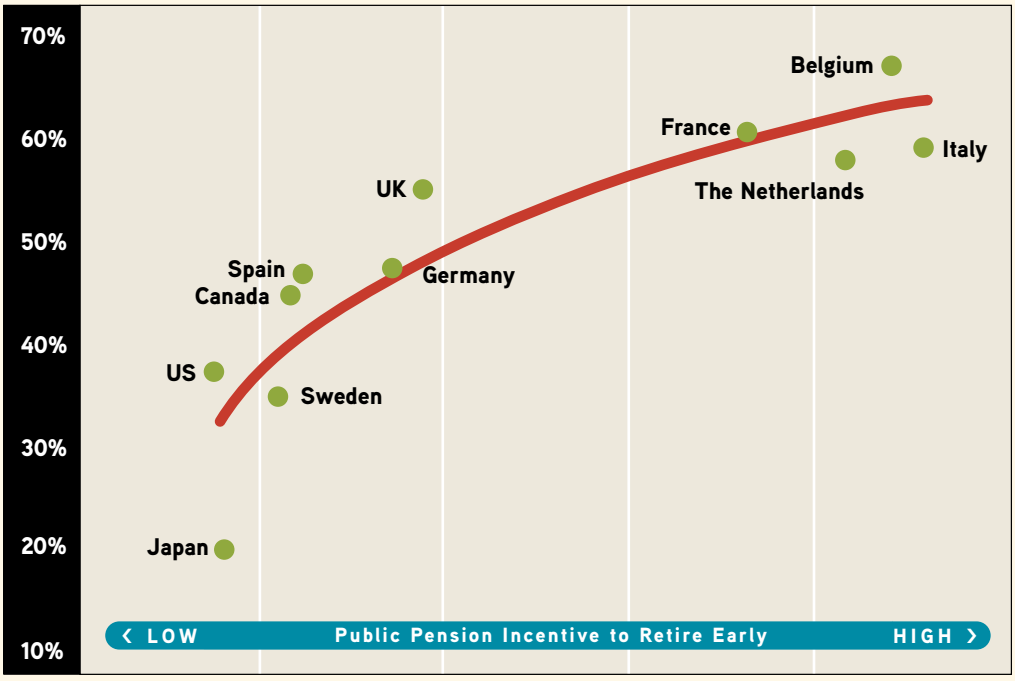
Estimates for Italian men in the year 2000 suggest a median retirement age of less than 59 years and a retirement duration of nearly 21 years.

If official retirement ages are increased, considerable attention will focus on the productivity of older workers. As a result, continuing education, workplace design, and part-time employment opportunities for older workers will become more important. Rising retirement ages also will spur reconsideration of early retirement provisions. Studies of retirement rules around the globe suggest that increasing workforce participation at older ages will require policy changes in national social security systems. A major ongoing NIA-funded series of studies in 11 industrialized countries (Belgium, Canada, France, Germany, Italy, Japan, The Netherlands, Spain, Sweden, the United Kingdom, and the United States) documents that in most countries public pensions provide enormous disincentives for continued work at older ages and encourage early retirement **(Figure 11).** This ongoing research shows that in spite of cultural differences across countries, there is an important relationship between the incentives for workforce participation of older workers and the provisions of social security programs. The study highlights the analytical power of focusing on the design of national retirement systems and the importance of incentives.

Figure 11:

PUBLIC PENSION INCENTIVES TO LEAVE THE LABOR FORCE FOR MEN IN 11 COUNTRIES

Percent of men age 55 to 65 not working



Source: Gruber J, Wise DA, eds. *Social Security and Retirement around the World.* Chicago, IL: University of Chicago Press, 1999.

TREND 8

Evolving Social Insurance Systems

In response to escalating pension expenditures, an increasing number of countries across the development spectrum are evaluating the sustainability of old-age social insurance systems.

Expenditures in today's 25 EU countries consumed one-eighth of gross domestic product in 2003 **(Figure 12).** In the future, the economic well-being of older populations will depend on a combination of income sources—earnings from continuing to work, social insurance programs, occupational pensions, and private savings. Public policies affect each of these sources, and proposed policy reforms have both costs and benefits. More empirical research, including cross-national comparative research, is needed to inform the development of policy.

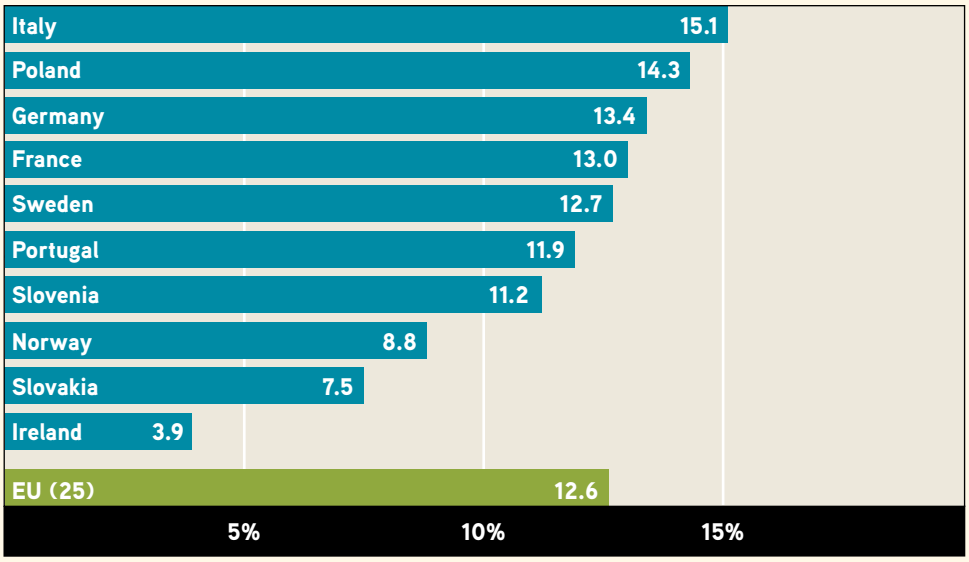
Many countries already have taken steps toward reforming their old-age social insurance programs (see box on page 23, "The Chinese Experience"). One common reform has been to raise the age at which workers are eligible for full public pension benefits. In 1983, the United States changed the age at which workers are eligible for full retirement benefits to increase incrementally beginning in 2003. Japan raised the pension age for men from 60 to 65 and for women from 57 to 65 in the past 15 years. The highest current statutory pensionable age is 67 for workers in Norway and Iceland. Increases in pensionable age have focused on women, who as recently as the early 1990s were entitled to draw pensions at a younger age than men in most countries. About 60 percent of countries now have the same pensionable age for both men and women. While the trend is to raise

the pensionable age, nearly one-third of African countries that offer social insurance benefits to their older populations have a life expectancy less than the statutory pensionable age for men and, in most cases, also for women.

Another strategy for bolstering economic security for older people has been to increase the contribution or tax rate on workers. Twenty-four countries (two-thirds of which are in Europe) now have payroll tax rates that equal or exceed 20 percent of wages. While payroll taxes raise needed revenues, they have the potential to discourage work in the formal sector. Other measures to enhance income for older people include new financial instruments for private savings, tax incentives for individual retirement savings, and supplemental occupational pension

Figure 12:

PENSION EXPENDITURES IN THE EUROPEAN UNION AS A PERCENTAGE OF GROSS DOMESTIC PRODUCT: 2003



Note: Pensions include old-age, anticipated old-age, partial, and disability benefits, as well as early retirement benefits due to reduced capacity to work.

Source: European Statistical System (EUROSTAT). Available at: http://epp.eurostat.ec.europa.eu. Accessed January 8, 2007.

plans. Eight countries already have chosen to make occupational pension plans mandatory.

Sixteen countries, primarily in Asia and the Pacific, have a Provident Fund, a compulsory savings program that is funded fully with investments typically managed by the government. Most existing Provident Funds were established in the 1950s; very few have been established since 1985. Instead, countries wishing to achieve a closer link between contributions and benefits have adopted some form of individual accounts. Chile, in the early 1980s, was the first to introduce individual accounts as part of a defined contribution plan. More than 20 other countries, mostly in Europe and South America, have since followed suit. In some countries, however, individual accounts are notional—in other words, no real accumulation of wealth exists because workers' contributions fund existing pension obligations. Depending on their design, individual retirement accounts may be risky for account holders who make uninformed decisions about diversification.

A trend toward defined contribution plans (in which employees contribute a portion of earnings, sometimes with matching contributions from employers, into investment accounts that they control) rather than defined benefit plans (in which employers guarantee specified levels of pension payments in the future) is evident. Among private-sector workers covered by an occupational pension plan in the United States, 40 percent were in a defined benefit plan in 2000, down from 84 percent in 1980. In contrast, the number of workers in defined contribution plans increased nearly fivefold from 1975 to 1998. In the private sector, the popularity of defined contribution plans is not driven by population aging but by increased job mobility, global competition, and the growth in the number of smaller firms. An important question concerning this trend is whether defined contribution plans, which shift risk and decisionmaking to the employee, will provide adequate income security for the duration of retirement.

The Chinese Experience: Rethinking Social Security in an Emerging Market Economy

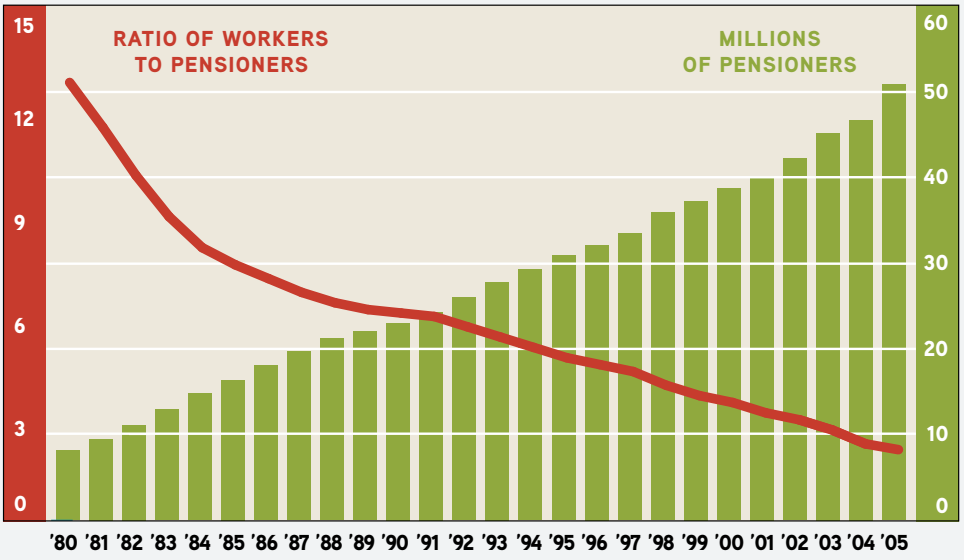
Although China is rapidly urbanizing, it remains a predominately rural country. The majority of Chinese workers are not yet covered by any formal pension system. Among those who have been and are now covered, there has been a steady rise in the number receiving formal pensions during the past 25 years. Concurrently, there has been a sustained decline in the ratio of covered workers to pensioners in China, a trend that threatens the well-being of the Nation's formal old-age security system **(Figure 13).**

Following a decade of experimentation, a new framework for old-age security emerged in the mid-1990s. The intent is twofold: (1) To replace cradle-to-grave support provided by State-owned enterprises with an expansion of coverage beyond the State sector and (2) to introduce pooled funding, which deflects risk. The new system includes a defined benefit pension providing a 20-percent replacement rate of the average wage and a defined contribution individual account. Owing to the unfunded liabilities of the former system, individual accounts have remained largely notional as today's workers pay for today's pensioners.

Social security reforms in China were brought about primarily because of the restructuring of State-owned enterprises and changes associated with the movement toward a market economy. However, new pressures have emerged in light of the rapid pace of population aging. Researchers are calling for a higher retirement age to counter the falling ratio of workers to pensioners. The Government is also considering converting to a system with a fully funded component, which raises questions about funding the transition to a new system. Another concern with this approach is where to invest funds that will accumulate in individual accounts, given that China's capital markets are relatively immature.

Figure 13:

CHINA'S DECLINING RATIO OF COVERED WORKERS TO PENSIONERS



Source: China Ministry of Labor and Social Security and China National Bureau of Statistics. *China Labor Statistics Yearbook.* Beijing: China Statistics Press, various years; and China National Bureau of Statistics. *China Statistical Abstract.* Beijing: China Statistics Press, 2006.

TREND 9

Emerging Economic Challenges

Population aging will have dramatic effects on local, regional, and global economies. Most significantly, financial expenditures, labor supply, and total savings will be affected.

In the past 5 years, academics and policymakers have begun to direct attention to the potential economic impact of unprecedented demographic change. Currently, however, we do not fully understand the interaction between policies and economic growth. A good deal will depend on how well markets function.

Population aging will strain some national budgets. Countries with extensive social programs targeted to the older population—principally health care and income support programs—find the costs of these programs escalating as the number of eligible recipients grows and the duration of eligibility lengthens. Further, few countries have fully funded programs; most countries fund these programs on a pay-as-you-go basis or finance them using general revenue streams. Governments may be limited in how much they can reshape social insurance programs by raising the age of eligibility, increasing contribution rates, and reducing benefits. Consequently, shortfalls may need to be financed using general revenues. Projections of government expenditures in the United States and other OECD countries show major increases in the share of gross domestic product devoted to social entitlements for older populations. In some cases, this share more than doubles as a result of population aging.

As countries reach a relatively high level of population aging, the proportion of workers tends to decline. Some European countries, including France, Germany, Greece, Italy, Russia, and the Ukraine, already have seen an absolute decline in the size of their workforce. And in countries where tax hikes are needed to pay for transfers to growing older populations, the tax burden may discourage future workforce participation. The impact on a country's gross domestic product will depend on increases in labor productivity and that country's ability to substitute capital for labor. Less developed countries can shift their economies from labor-intensive to capital-intensive sectors as population aging advances. Options for more developed countries may be more constrained.

Because countries age at different paces, it is possible for the elements of production—labor and capital—to flow across national boundaries and mitigate the impact of population aging. Studies predict that, in the near term, surplus capital will flow from Europe and North America to emerging markets in Asia and Latin America, where the population is younger and supplies of capital relatively low. In another 20 years, when the baby boom generation in the West has mostly retired, capital likely will flow in the opposite direction. However, these studies rest on the uncertain assumption that capital will flow easily across national boundaries.

Traditionally, labor is viewed as less mobile than capital, although migration could offset partially

the effects of population aging. Currently, 22 percent of physicians and 12 percent of nurses in the United States are foreign born, representing primarily English-speaking African countries, the Caribbean, and Southeast Asia. The foreign-born workforce also is growing in most OECD countries. Over the next 10 years, the European experience will be particularly instructive in terms of the interplay of aging and migration.

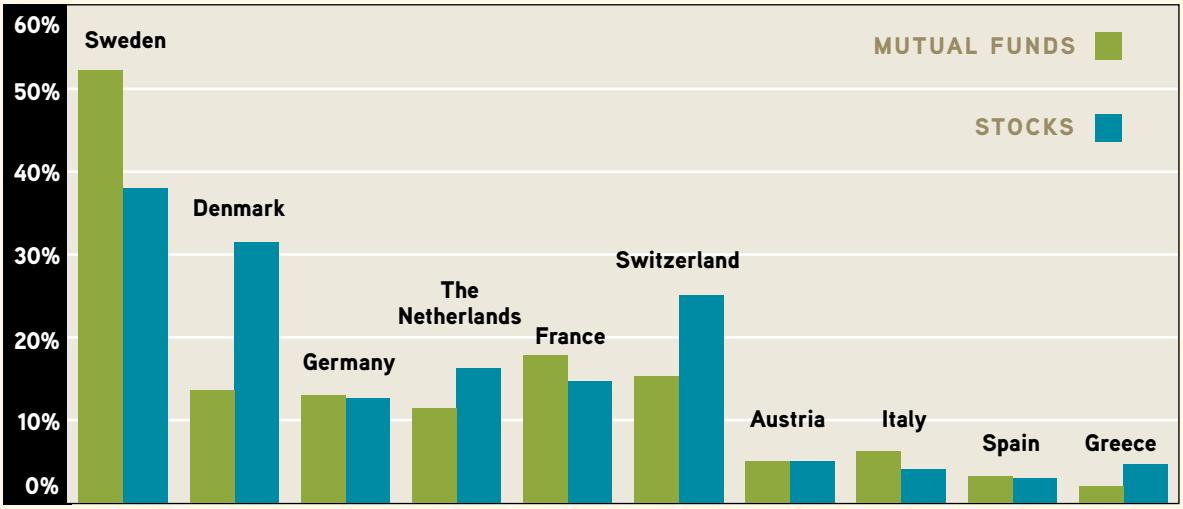
The life-cycle theory of consumption and savings is that households accumulate wealth during working years to maintain consumption in retirement. The total of a country's individual life-cycle savings profiles determines whether households in that country are net savers or nonsavers at any point in time. A country with a high proportion of workers will tend to be dominated by savers, placing downward pressure on the rate of return to capital in that economy. Countries with older populations will be tapping their savings and driving rates of return higher because of the scarcity of capital.

Retirement resources typically include public and private pensions, financial assets, and property. The relative importance of these resources varies across countries. For example, a groundbreaking study revealed that only 3 percent of Spanish households with at least one member age 50 or older own stocks (shares), compared to 38 percent of Swedish households **(Figure 14).** The largest component of household wealth in many countries is housing value. This value could fall if large numbers of older homeowners try to sell houses to smaller numbers of younger buyers.

Financial markets need to be flexible and innovative to meet the needs of aging populations. Undoubtedly, population aging will create new economic pressures. At the same time, however, it will create exciting opportunities for expanding our collection of financial tools to accommodate a changing world (see box on page 26, "Expanding Opportunities for Economic Growth").

Figure 14:

PERCENT OF OLDER HOUSEHOLDS OWNING MUTUAL FUNDS (UNIT TRUSTS) AND STOCKS (SHARES): 2004



Note: Data refer to households with at least one member age 50 or above.

Source: Börsch-Supan A, Brugiavini A, Jurges H, Mackenbach J, Siegrist J, Weber G, eds. *Health, Ageing and Retirement in Europe. First Results from the Survey of Health, Ageing and Retirement in Europe.* Mannheim: Mannheim Research Institute for the Economics of Aging, 2005.

Expanding Opportunities for Economic Growth

Because of fertility declines, nearly all countries have experienced, or will soon experience, a large increase in the share of their population concentrated in the working ages. This increase should raise per capita income and government tax revenues, leading to the first demographic dividend. An analysis of 228 regions suggests that the first dividend lasted 30 to 35 years in most developed and transitional economies. It was considerably longer in much of Asia and Latin America, and it likely will be longer still in sub-Saharan Africa. The economic gain resulting from large numbers of young workers critically depends on the policy environment. In several countries in East and Southeast Asia, for example, large birth cohorts reached working ages with valuable skills and high educational attainment, and export-oriented economies were flexible enough to put their skills to productive uses. In other countries, however, weak educational systems and labor market rigidities have resulted in a youth employment crisis rather than the hoped-for demographic dividend.

In the decades following the youth bulge in the labor force, as the large cohorts move into their middle and later working years, a second demographic dividend is possible. This is because the peak productive ages in a modern economy are also peak ages for saving, and in a modern economy, savings can be mobilized for productive investment. With an unusually large proportion of the population consisting of workers in their 40s and 50s, countries should be able to increase their savings rates, and thus investment rates, which can produce a long-lasting increase in national output. As with the first demographic dividend, the second one works only in the right institutional and policy settings. Many countries, including the United States, did not experience higher personal savings rates during the decades when Baby Boomers were in their 40s and 50s.

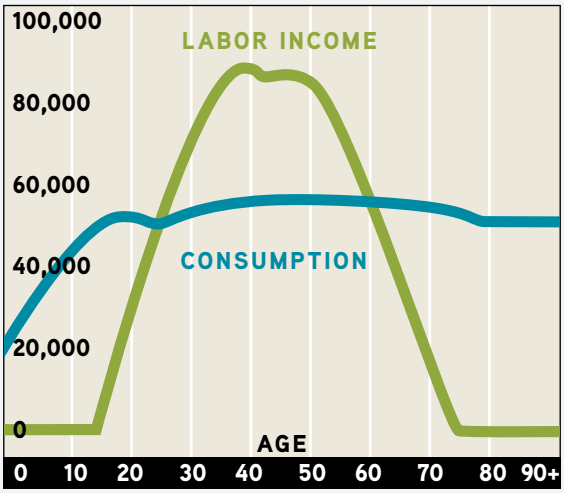
Researchers differ in their estimates of the importance of these dividends. One estimate is that demographic dividends, if fully exploited, would have contributed between 1 and 2 percentage points to income growth between 1970 and 2000 for most regions of the world. However, demographic dividends are not automatic; they depend on the existence of strong institutions and policies that transform population aging into economic growth. Weaknesses in the governance and management of pension programs—for instance, significant tax evasion and unsustainable increases in public pension benefits—can offset the benefits of demographic dividends, as can persistent high levels of unemployment and underemployment. As a result, governments and employers may be tempted to make promises to the working-age population that prove difficult to keep.

A useful tool for understanding dividends and their impact is to estimate production and consumption over the life cycle **(Figure 15).** Researchers can use these estimates to account for transfers across generations, examine savings patterns, estimate spending on public programs, and assess the burden of family support for older people.

Figure 15:

ECONOMIC LIFE CYCLE OF A TYPICAL THAI WORKER

Annual per capita labor income and consumption (in baht)



Source: Chawla A. National Transfer Account Estimates for Thailand, as reported in Lee R, Mason A, eds. What Is the Demographic Dividend? *Finance and Development*. 2006:43(3). Available at: http://www.imf.org/external/pubs/ft/fandd/2006/09/basics.html.

Endnote › DATA FOR AN AGING WORLD

Ten years ago at the Summit of the Eight in Denver, Colorado, the Group of Eight (G8) leaders recognized the importance of population aging. The Denver Communique encouraged nations to collaborate in biomedical and behavioral research and to learn from one another how policies and programs can help strengthen pension, health, and long-term care systems. With support from the U.S. National Institute on Aging, three important cross-national efforts have emerged to provide policymakers with information essential for understanding the complexities of our aging world.

The Survey of Health, Ageing and Retirement in Europe (SHARE) is an interdisciplinary longitudinal data set covering people age 50 and over. Modeled after the U.S. Health and Retirement Study (HRS) and the English Longitudinal Study on Ageing (ELSA), SHARE allows comparison of the effects of different pension and health care systems on the lives of middle-aged and older Europeans. Already underway in 15 European countries, SHARE is designed to cover all 27 members of the European Union, plus Israel and Switzerland, in 2008.

The International Network for the Demographic Evaluation of Populations and Their Health (INDEPTH) comprises 37 sites in Africa, Asia, and Latin America that monitor populations living in distinct geographic areas. Combining demographic surveillance with innovative techniques, INDEPTH sites provide mortality data otherwise lacking for the less developed world, especially with regard to adult populations. The longitudinal nature of these data is essential to understanding emerging patterns of adult mortality and noncommunicable diseases and will help shape chronic disease prevention and control programs.

Launched by the World Health Organization, the Study of Global Ageing and Adult Health (SAGE) is a longitudinal study in six countries: China, Ghana, India, Mexico, Russia, and South Africa. SAGE follows groups of individuals age 50 and over for 10 to 15 years to examine changes in their health and well-being and determine predictors of change, such as economic activity, life transitions, and social cohesion. SAGE will be linked to data from INDEPTH sites in Asia and Africa to enhance the breadth and analytic potential of both data sets.

Suggested Resources

Readings

Federal Reserve Bank of Kansas City. *Global Demographic Change: Economic Impacts and Policy Challenges.* Symposium proceedings. August 26–28, 2004. Available at: http://www.kc.frb.org/Publicat/sympos/2004/sym04prg.htm.

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Organisation for Economic Cooperation and Development (OECD) Directorate for Employment, Labour and Social Affairs. *Disability Trends among Elderly People: Re-Assessing the Evidence in 12 OECD Countries (Interim Report).* Paris, France: OECD, *forthcoming 2007.*

United Nations Department of Economic and Social Affairs, Population Division. *World Population Ageing 1950–2050.* New York: United Nations, 2002.

Web Resources

English Longitudinal Study of Ageing
http://www.ifs.org.uk/elsa/

European Statistical System (EUROSTAT)
http://epp.eurostat.ec.europa.eu

Health and Retirement Study
http://hrsonline.isr.umich.edu/

International Network on Health Expectancy and the Disability Process
http://www.prw.le.ac.uk/reves/

Survey of Health, Ageing and Retirement in Europe
http://www.share-project.org/

United Nations Expert Group Meeting on Social and Economic Implications of Changing Population Age Structures
http://www.un.org/esa/population/meetings/EGMPopAge/EGMPopAge.htm

United Nations Second World Assembly on Ageing
http://www.un.org/esa/socdev/ageing/waa/

U.S. Census Bureau International Data Base
http://www.census.gov/ipc/www/idbnew.html

U.S. National Institute on Aging
http://www.nia.nih.gov/

World Health Organization Study on Global Ageing and Adult Health
http://www.who.int/healthinfo/systems/sage/en/index.html

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