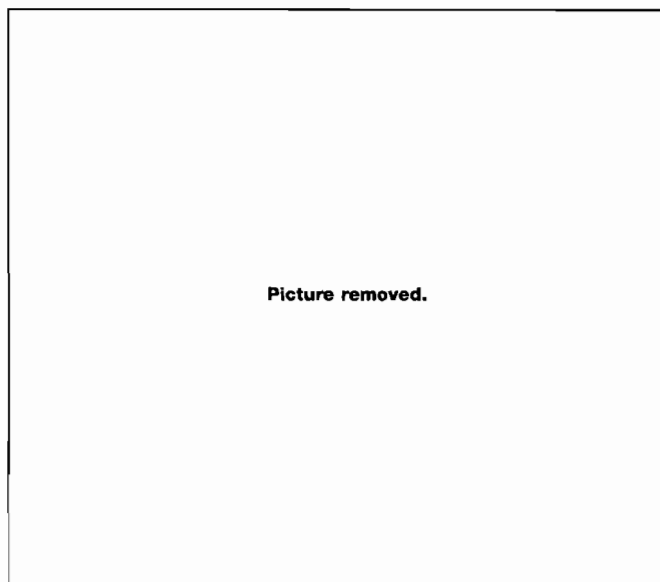


Global Aging: The Challenge of Success

By Kevin Kinsella and David R. Phillips

Populations are growing older in countries throughout the world. While the populations of more developed countries have been aging for well over a century, this process began recently in most less developed countries, and it is being compressed into a few decades. By 2050, nearly 1.2 billion of the expected 1.5 billion people age 65 or older will reside in today's less developed regions.¹ Just 22 percent of the world's older people will live in what we today call more developed countries. This demographic transformation will profoundly affect the health and socioeconomic development of all nations.

Population aging may be seen as a human success story—the triumph of public health, medical advancements, and economic development over diseases and injuries that had limited human life expectancy for millennia. But the worldwide phenomenon of aging also brought an acknowledgment by the United Nations (UN) of the many challenges regarding aging and national development, issues concerning the sustainability of families and the ability of states and communities to provide for aging populations.² In April 2002, representatives from 159 nations met in Madrid to convene the Second UN World Assembly on Aging, two decades after the first such assembly. During the 20-year interim between these major conferences, the focus had shifted from basic demographic and economic issues of aging to the inclusion of older people at all levels of society, a movement to



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Russia, like many industrialized countries, has seen its population age because of decades of low birth rates.

expand roles for older people, and active aging policies. Policymakers increasingly recognize that policies on aging must address the entire society and people of all ages and that global aging needs to be integrated into the broader process of development. The central themes running throughout the Madrid International Plan of Action on Ageing 2002 fall under three priorities:

- Older people and economic development,
- Advancing health and well-being into old age, and
- Ensuring enabling and supportive environments.

This *Population Bulletin* addresses many issues that fall under these overarching priorities. It examines the causes of global population aging and considers related dimensions such as the importance of health improvements and extended life expectancy for the individual well-being of older people and for social costs related to health care.

This *Bulletin* also considers whether mounting evidence of declining disability at older ages answers the question: Are longer life expectancies accompanied by better health or simply more years of poor health? Related to this are questions surrounding intergenerational relationships affected by demographic and social changes, all central to the three priorities outlined at the Madrid conference. How will smaller families and new forms of familial organization, for example, affect social and personal support systems? How will the labor market, pension plans, and services adapt to longer life expectancies, as retirees require 25 or more years of income as well as social and other services?

Who Is Old?

When does someone become “old” or “elderly”? A number of terms are used to describe people considered old, but there is an increasing awareness that the terms used should acknowledge the tremendous diversity inherent in a group of people whose ages can span a range of 40 or more years.

Some gerontologists object to the terms “elderly” and “senior citizen” as inadequate generalizations that connote negative stereotypes, including social isolation, frailty, and physical and financial dependence. At the same time, a general term is useful for crossnational comparisons. In this *Bulletin*, “older people” and “older population” refer to people age 65 or older; the “oldest old” refers to people age 80 or older, unless otherwise noted.

The Global Process of Aging

The world’s older population has been growing more numerous for centuries, but the pace of growth has accelerated. The global population age 65 or older was estimated at 461 million in 2004, an increase of 10.3 million just since 2003.⁵ Projections suggest that the annual net gain will continue to exceed 10 million over the next decade—more than 850,000 each month. In 1990, 26 nations had older populations of at least 2 million, and by 2000, older populations in 31 countries had reached the 2 million mark. Projections to 2030 indicate that more than 60 countries will have at least 2 million people age 65 or older.

People usually associate the growth of older populations with the industrialized countries of Europe and North America. Indeed, industrialized nations have the highest percentages of older people in the world today; before the middle of the 21st century, some of these countries may have more grandparents than children under age 18. But less developed nations also have large numbers of older citizens—and the numbers of older people are increasing rapidly. Sixty percent of the world’s older population now live in less developed countries—an estimated 279 million people. By 2030, this proportion is projected to increase to 71 percent (690 million). Many less developed countries have had or are now experiencing a significant downturn in natural population increase (births minus deaths) similar to the decline that previously occurred in industrialized nations. As the rate of natural increase slows further, age structures will change, and the older population will be an ever-larger proportion of each nation’s total population.

Measures of Aging

Population aging is usually defined as the percentage of a given population age 65 or older (and sometimes the

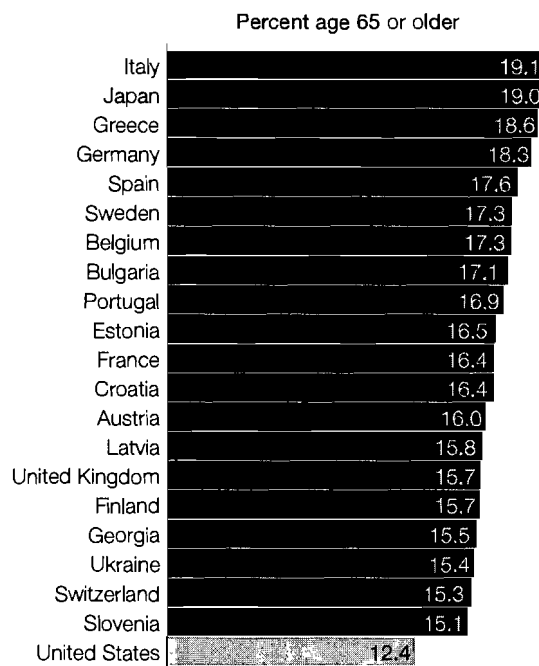
percentage ages 60 and older). More than 19 percent of Italy's population is age 65 or older, making it the world's "oldest" major country. Except for Japan, the world's 20 oldest countries are all in Europe (see Figure 1). The U.S. population is relatively "young" by European standards, with less than 13 percent age 65 or older. The United States ranks as the 38th oldest country. The U.S. proportion will rise only slightly during the first decade of the 21st century as the early large birth cohorts of the baby boom (born between 1946 and 1964) approach 65. Beginning in 2011, the aging of the baby-boom generation will push the proportion of older Americans to 20 percent by 2030. It will still be lower than in most Western European countries.

Europe should remain the world's oldest region well into the 21st century. The older share of population is expected to more than double between 2000 and 2030 in Asia and Latin America and the Caribbean. Aging is occurring more slowly in sub-Saharan Africa, where relatively high birth rates are keeping the population "young" (see Table 1, page 6).

But these regional averages often mask great diversity among and within countries. India and Thailand may be close geographically, but Thailand is aging much more rapidly. Likewise, many Caribbean nations have high proportions of older people (the Caribbean is the oldest of all less developed regions) compared with their Central American neighbors. More important, simple percentages cannot depict the momentum of older-population growth. Although the percent of older population in sub-Saharan Africa will change little between 2000 and 2015, the size of this population is expected to jump by nearly 50 percent—from 18.9 million to 28.1 million people—as the region's total population surges from 651 million to a projected 899 million. In less developed countries as diverse as Malaysia and Colombia, older populations are expected to more than triple in size between 2000 and 2030.

Figure 1

The World's 20 'Oldest' Countries and the United States, 2004



Note: The United States ranks 38th.

Source: U.S. Census Bureau, International Data Base (www.census.gov/ipc/www/idbnew.html), accessed Dec. 12, 2004).

There are several demographic indices of aging—the aging index, median age, and support ratios—that compare different portions of a given population. One straightforward indicator of age structure is the *aging index*, defined here as the number of people age 65 or older per 100 children under age 15. At the turn of the century, only a few countries (such as Italy, Germany, Bulgaria, and Japan) had more older people than youth ages 0 to 14. By 2030, however, nearly all more developed countries will have a projected aging index of at least 100, and several European countries and Japan will be in excess of 200. Today's aging index usually is much lower in less developed countries than in the more developed world, and the pattern of future change is likely to vary among countries. Absolute change in the aging index will be small if future fertility rates remain

Table 1
Percent of Population in Older Ages by Region, 2000, 2015, and 2030

Region	Year	65 years or older	80 years or older
Asia	2000	5.9	0.9
	2015	7.8	1.4
	2030	12.0	2.3
Europe	2000	14.7	3.0
	2015	17.6	4.7
	2030	23.5	6.4
Latin America/Caribbean	2000	5.6	1.0
	2015	7.6	1.5
	2030	11.5	2.5
Middle East/North Africa	2000	4.4	0.6
	2015	5.5	0.9
	2030	8.4	1.4
North America	2000	12.4	3.3
	2015	14.7	3.9
	2030	20.0	5.4
Oceania	2000	10.1	2.3
	2015	12.4	3.1
	2030	16.3	4.4
Sub-Saharan Africa	2000	2.9	0.3
	2015	3.1	0.4
	2030	3.6	0.5

Source: U.S. Census Bureau, International Data Base (www.census.gov/ipc/www/idbnew.html, accessed Dec. 12, 2004).

relatively high. Generally, however, the proportional rise in the aging index in less developed countries is expected to be greater than in more developed countries.

The *median age* of country populations will increase everywhere. The median age in most developed countries is at least 32, while the median age in most developing nations is below 25. By 2030, Italy and Japan are projected to have the world's highest median age, with half their populations age 52 or older, largely reflecting their extremely low fertility. At the other end of the spectrum, persistently high birth rates are likely to preclude a large rise in median age in such less developed countries as Pakistan, Liberia, and Malawi.

Finally, *social support ratios* are another widely used indicator of broad changes in a nation's age struc-

ture. These ratios typically indicate the number of youths and/or older people per 100 people ages 20 to 64, the primary working ages. One commonly used term is the *elderly support ratio*, also called the elderly dependency ratio, and is defined here as the number of people age 65 or older per 100 people ages 20 to 64 in a given population (see Box 1). In future decades, elderly support ratios will rise in more developed countries because of declining fertility and increasing longevity among their residents. The rise has been and will continue to be modest in most countries because the large post-World War II birth cohorts will still be of working age through at least 2010. In the United Kingdom, the United States, Russia, and several other industrialized countries, the elderly support ratio will not change significantly in the first decade of the 21st century. Other industrialized nations, however, are aging much faster. Between 2000 and 2015, the elderly support ratio is likely to increase 33 percent in Denmark (from 24 to 32) and 36 percent in the Czech Republic (from 22 to 30). Nearly all European countries will have elderly support ratios greater than 40 by 2030. Japan's elderly support ratio is expected to jump from 27 to 45 between 2000 and 2015, and to 53 by 2030.

In countries where fertility remains high or has just recently begun to decline significantly—as in much of Africa and South Asia—elderly support ratios should change little between 2000 and 2030. Eastern and southeastern Asia and parts of Latin America, on the other hand, should experience significant change in elderly support ratios during that time. The elderly support ratio is projected to at least double between 2000 and 2030 in many Asian and Latin American countries, and to triple in South Korea.

The Oldest Old

The older population within countries is also aging. Over time, a nation's older population often

grows older on average as a larger proportion survive to advanced ages. The "oldest old" (people age 80 or older) constituted 18 percent of the world's older people in 2004: 24 percent in more developed countries and 15 percent in less developed countries. More than half of the world's oldest old in 2004 lived in just six countries: China, the United States, India, Japan, Germany, and Russia.

In many countries, the oldest old are the fastest growing segment of the population. In the mid-1990s, the global growth rate of the oldest old was somewhat lower than that of the world's older population, a result of a sharp dip in birth rates that prevailed in many countries around the time of World War I. People reaching age 80 in 1996, for example, were part of a relatively small birth cohort. The growth rate of the world's oldest-old population from 1996 to 1997 was only 1.3 percent. Just a few years later, however, the larger post-World War I cohort entered advanced ages, and the oldest age group began to swell. Between 1999 and 2000, the growth rate of the world's 80-and-older population had jumped to 3.5 percent, considerably higher than that of the world's elderly as a whole (2.3 percent). Demographers expect to see this high growth of the oldest old continue. The number of people age 80 or older is projected to jump nearly 50 percent between 2000 and 2010, and another 37 percent between 2010 and 2020. In contrast, the 65-and-older population is projected to increase 24 percent between 2000 and 2010.

Age profiles of elderly populations vary considerably among countries. In the United States, the oldest old were 26 percent of all older people in 2000. This share will rise gradually during the current decade, then decline by 2020, and return slowly to the 2000 level as we near 2030. Some European nations will experience a sustained rise in the ratio of people age 80 or older, while others will see an increase during the next two

Box 1

How Useful Are Elderly Support Ratios?

The standard definition of an elderly support ratio implies that all people over age 64 are in some sense dependent on the population of working age (20 to 64). People ages 20 to 64 support older people indirectly through payroll taxes and contributions to social welfare programs. We know, however, that elderly populations have extremely diverse resources, needs, and abilities, and that many older people are financially and physically independent. Through their taxes, income, and wealth, older people also fuel economic growth and provide support to younger generations. Likewise, substantial portions of the working-age population may not earn incomes because they are unemployed, unable to work, in school, or have opted out of the labor force.

Although it is difficult to include factors such as intrafamily financial assistance and child-care activities in an overall measure of social support, it is feasible to consider employment characteristics in both the working-age and elderly populations. An alternative to the standard support ratio might, for example, include only the economically active population in the denominator, thereby excluding people who choose not to work, unpaid household workers, nonworking students, and individuals whose poor health keeps them out of the labor force. A related alternative is to also remove economically active people age 65 or older from the numerator on the assumption that they are not economically dependent. Economically active older people could be added to younger economically active adults who also contribute tax revenue.

The alternative ratios in each country are higher than the standard elderly support ratio in most industrialized nations. Japan is an exception—older Japanese have a relatively high rate of participation in part-time work. Whether labor force participation is excluded or included can make a considerable difference for planning agencies that use support ratio calculations. When data are available, these ratios also can be adjusted for such factors as workers under age 20; the effects of unemployment; average retirement ages; levels of pension receipt and institutionalization among older people; and the prevalence of high-cost disabilities.

decades and then a subsequent decline. The most striking national increase is likely to occur in Japan; by 2030, 40 percent of all older Japanese are expected to be at least 80 years old. Most less developed countries should experience modest long-term increases in this ratio.

Even when the proportion of oldest old within an elderly population remains stable, the absolute numbers of this oldest group can increase substantially. In the United States, the oldest old increased from 374,000 in 1900 to more than 10 million today.

At very old ages, the rate of increase in mortality tends to slow.

The number is projected to rise by more than 9 million between 2004 and 2030, even though the share of Americans age 80 or older will remain about the same. Four-generation families are becoming increasingly common, and the aging of the baby boom may produce a great-grandparent boom in many countries.

Prior population projections often have underestimated the slowdown in mortality among the oldest old, and the number of tomorrow's oldest old could be much higher than now anticipated. The actual numbers in the highest age groups are important for planners and policymakers because the oldest old consume disproportionate amounts of health and long-term care services.⁴ In the past, population projections for the world's countries often grouped everyone age 80 or older into a single, open-ended component. Recently and for the first time, the UN Population Division, the U.S. Census Bureau's International Programs Center, and other institutions are adding more age detail to their international population projections—often up to ages 100 and older—a reflection of the expected growth at these oldest ages.

As longevity increases, the concept of "oldest old" will change. While people of extreme old age constitute a tiny portion of total population in most of the world, their numbers are of growing importance, especially in more developed nations. Thanks to improvements in nutrition, health, and health care, we now have the opportunity to consider significant growth of the population age 100 or older. According to European researchers, the number of centenarians has doubled each decade since 1950 in industrialized countries. Using reliable statistics from 10 Western European countries and Japan, demographers James Vaupel and Bernard Jeune estimated that some 8,800 centenarians lived in these countries as of 1990, and that the number of centenarians grew at an average annual rate of approximately 7 percent between the early

1950s and the late 1980s.⁵ Vaupel and Jeune also estimated that 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.

The Demographic Drivers of Aging

When asked "Why do populations age?," most people intuitively think of changes in longevity. We know that life expectancy has been rising in most countries throughout the world, so it seems reasonable that population aging is an outcome of people living longer. Yet, the most prominent historical factor in population aging has been declining fertility. If we think of population aging as an increase in the percent of people age 65 or older, we realize that, over time, a decline in the number of babies will mean fewer young people and proportionally more people at older ages.

Fertility—The Primary Driver

The decrease in fertility in industrialized nations during the last century has pushed the average number of children per woman in almost all more developed countries below the population replacement level of 2.1 children. Sustained low fertility since the late 1970s has reduced the size of successive birth cohorts and increased the proportion of older people in these countries' populations. Fertility decline in the less developed world has been more recent and more rapid; most regions have seen large reductions in fertility rates during the last 30 years. Although the aggregate total fertility rate (TFR, the average number of children per woman given current birth rates) remains in excess of 4.5 children per woman in Africa and many countries of the Middle East, overall levels in Asia and Latin America decreased by about 50 per-

cent (from 6 to 3 children per woman) between 1965 and 1995. The TFR in many less developed countries is now at or below replacement level—notably in the world's most populous country, China. By 2000, a majority of the world's population lived in countries with near- or below-replacement fertility.⁶ The UN projects that, by 2050, three of every four of today's less developed countries will have below-replacement fertility.

Populations with high fertility tend to have low proportions of older people and vice versa. The term “demographic transition” is used to describe a gradual process of change from high rates of fertility and mortality to low rates of fertility and mortality. The process is characterized first by declines in infant and childhood mortality, as infectious and parasitic diseases are controlled through expansion of public health services and facilities and disease eradication programs. This improvement in mortality occurs while fertility is still high, resulting in large birth cohorts and an expanding proportion of children relative to adults. Other things being equal, the initial decline in mortality generates a younger population age structure.⁷

Increasing Importance of Mortality

In countries where infant mortality rates are relatively high but declining, most of the improvement in life expectancy at birth results from helping infants survive the high-risk early years of life. Reductions in maternal mortality also contribute to increased life expectancy at birth. As a nation's infant, childhood, and maternal mortality reach low levels, longevity gains at older ages become more prominent contributors to increased life expectancy.⁸ Most countries today are experiencing a rise in life expectancy at older ages, which contributes to rising life expectancy at birth. For example, the average Japanese woman reaching age 65 in 2000 could expect to live more than 22 additional years,

and the average man more than 17 years. Japanese life expectancy at age 65 for both sexes combined increased 44 percent from 1970 to 2000, while life expectancy at birth increased only 9 percent. Comparative figures for the United States are 19 percent and 9 percent, respectively.

The speed at which death rates at advanced ages decline will play a major role in determining future numbers of older, and especially of very old, populations. The remaining life expectancy of 80-year-old women in England and Wales is about 50 percent higher today than it was in 1950. Hence, the number of female octogenarians is about 50 percent higher than it would have been had oldest-old mortality remained at 1950 levels. In absolute terms, there are more than 500,000 British women age 80 or older alive today who otherwise would have died if death rates for the oldest-old had not improved.⁹

Until the mid-1990s, conventional demographic wisdom held that the human death rate increases with age in an exponential manner. Newer research has documented that, at very old ages, the rate of increase in the mortality rate tends to slow down. A study of 28 countries with reliable data for 1950 to 1990 found not only a decline in mortality rates at ages 80 and older, but also a tendency toward greater decline in more recent years.¹⁰ Other work has confirmed this tendency, and one study in the United States suggests that the age at which mortality deceleration occurs is rising.¹¹

There are at least two potential explanations of this deceleration of mortality at the oldest ages. The “heterogeneity” hypothesis, an extension of the notion of “survival of the fittest,” posits that the deceleration in old-age mortality is a result of frailer older people dying at younger ages, thus creating a very old population with exceptionally healthy attributes resulting from genetic endowment and/or lifestyle. A second, “individual-risk” hypothesis, suggests that the rate of aging may slow down at very old ages, and/or that certain genes that

are detrimental to survival may be suppressed.¹² The observed deceleration in mortality, combined with the fact that human mortality at older ages has declined substantially, has led to the questioning of many of the theoretical tenets of aging. Important insights are being garnered from “biodemographic” research that attempts to cross-fertilize the biologic and demographic perspectives of aging and senescence. A clearer picture of the causes of mortality deceleration at very old ages may emerge from the study of evolutionary biology and aging in nonhuman species. But recognition of this slowdown in old-age mortality—at a time when numbers of the very old are growing rapidly—has important policy implications.¹³

Changes in Life Expectancy

The dramatic increases in life expectancy that began in the mid-1800s often are thought to be the result of medical breakthroughs. In fact, the major impact of improvements in medicine and sanitation did not occur until the late 19th century. Prior innovations in industrial and agricultural production and distribution, which improved nutrition for large numbers of people, were more powerful forces in mortality reductions. A growing multidisciplinary research consensus attributes the gain in human longevity since the 1800s to the interplay of advancements in medicine and sanitation against a backdrop of new modes of familial, social, economic, and political organization.¹⁴ Life expectancy at birth in Japan approached 82 years in 2003, the highest level among the world’s major countries. Life expectancy is at least 79 years in several other developed nations, including Australia, Canada, Italy, Iceland, Sweden, and Switzerland. Average life expectancy in the United States and most other developed countries ranged between 76 and 78 years.

Throughout the less developed world, there are extreme variations in

life expectancy at birth. Some nations have levels equal to or higher than those in many European nations, whereas life expectancy at birth in numerous African countries is less than 45 years. The average person born in a more developed country can now expect to outlive his or her counterpart in the less developed world by 14 years.

In some nations, life expectancy more than doubled during the 20th century (see Table 2). Increases in life expectancy were more rapid in the first half than in the second half of the century. Between 1900 and 1950, many Western nations added 20 or more years to their average life expectancy. Reliable estimates of life expectancy for less developed countries prior to 1950 are scarce, but changes in life expectancy in these countries have been fairly uniform since then. Practically all nations have shown continued improvement, 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 average life expectancy at birth for the region increased from less than 45 years in 1950 to more than 72 years today.

An increasing gender differential in life expectancy was a hallmark of mortality patterns in more developed countries in the 20th century, reflecting the generally lower mortality of females than males in every age group and for most causes of death. In Europe in 1900, women typically outlived men by two or three years. Today, the average gap between the sexes is approximately seven years, and may be as high as 12 years in parts of the former Soviet Union. Gender differentials tend to be smaller (between three and six years) in less developed countries, and are reversed in a few South Asian and Middle Eastern societies in which such cultural factors as low female social status and a preference for male rather than female offspring affect female life expectancy.

Changing Age Structure

Populations begin to age when fertility declines and adult mortality rates improve. Successive birth cohorts eventually become smaller, although the trend may be interrupted by “baby-boom echoes” as women of prior large birth cohorts reach child-bearing age. International migration usually does not play a major role in the aging process, but can be important in smaller populations. Some Caribbean nations, for example, have experienced a combination of emigration of working-age adults, immigration of retirees from other countries, and return migration of older former emigrants; all three factors contribute to population aging. Many observers expect international migration to assume a more prominent role in the aging process, particularly in “older” countries where persistently low fertility has led to stable or even declining population size.¹⁵

Most if not all countries once had a youthful age structure similar to that of less developed countries as a whole in 1950, with a large percentage of the entire population under age 15. Given the comparatively high rates of fertility that prevailed in most less developed countries from 1950 through the early 1970s, the pyramidal shape of the age and sex profile of less developed countries had not changed greatly by 1990 (see Figure 2, page 12). However, the effects of fertility and mortality decline can be seen in the projected age-sex pyramid for 2030, which loses its strictly triangular shape as the size of younger five-year cohorts stabilizes and the older portion of the total population increases.

The picture in more developed countries has been and will be quite different. In 1950, there was relatively little variation in the size of five-year groups between the ages of 5 and 24. The beginning of the post-World War II baby boom can be seen in the 0-to-4 age group. By 1990, the baby-boom cohorts were ages 25 to 44, and younger cohorts

Table 2

Life Expectancy at Birth in Years, Selected Countries, 1900, 1950, and 2003

Region/country	Circa 1900		Circa 1950		Circa 2003	
	Male	Female	Male	Female	Male	Female
More developed countries						
Western Europe						
Austria	38	40	63	68	75	81
France	45	49	64	70	75	83
Sweden	53	55	70	73	78	83
United Kingdom	46	50	67	72	76	81
Southern and eastern Europe						
Hungary	37	38	62	66	68	76
Italy	43	43	64	68	76	82
Spain	34	36	62	66	76	83
Other						
Australia	53	57	67	72	76	82
Japan	43	44	60	63	78	85
United States	48	51	66	72	74	80
Less developed countries						
Africa						
Egypt	—	—	41	44	67	71
Ghana	—	—	40	44	57	59
Mali	—	—	31	34	48	49
South Africa	—	—	44	46	45	51
Uganda	—	—	39	42	45	47
Asia						
China	—	—	39	42	69	73
India	—	—	39	38	63	65
Kazakhstan	—	—	52	62	61	72
South Korea	—	—	46	49	72	79
Syria	—	—	45	47	71	73
Latin America						
Argentina	—	—	60	65	71	78
Bolivia	—	—	39	43	62	66
Brazil	—	—	49	53	64	73
Costa Rica	—	—	56	59	76	81
Mexico	—	—	49	52	70	76

— Not available.

Note: Average number of years a person born in those years could expect to live.

Source: UN Population Division, *World Population Prospects: The 2002 Revision* (2003); and G. Siampos, *Statistical Journal of the United Nations Economic Commission for Europe* 7, no. 1 (1990): 13-25.

were successively smaller. If projected fertility rates are reasonably accurate through 2030, the aggregate pyramid will start to invert, with more weight on the top than on the bottom, and the size of the oldest-old population (especially women) will increase substantially.

Emergent Diversity

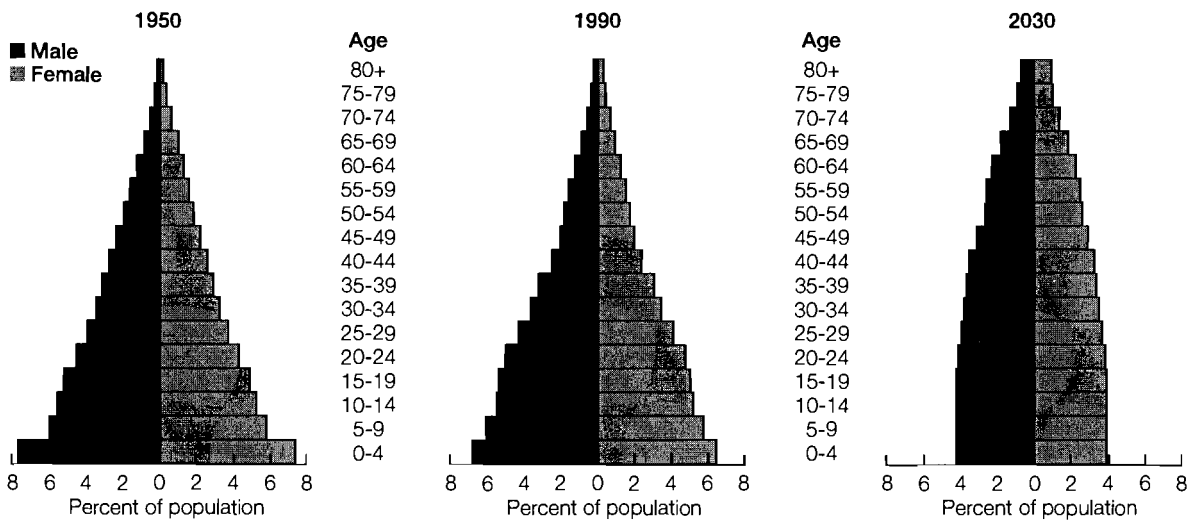
Demographers have long known that the world was aging because of declines in birth rates and increases in adult life expectancy. On the traditional path toward population aging, however, a number of unexpected boulders have surfaced. Scientists

have been surprised by the speed of aging in some parts of the world, by unforeseen developments in mortality change, and by the emergence or reemergence of diseases. While differences in the levels of population aging between more developed and less developed countries have been obvious for some time, several devel-

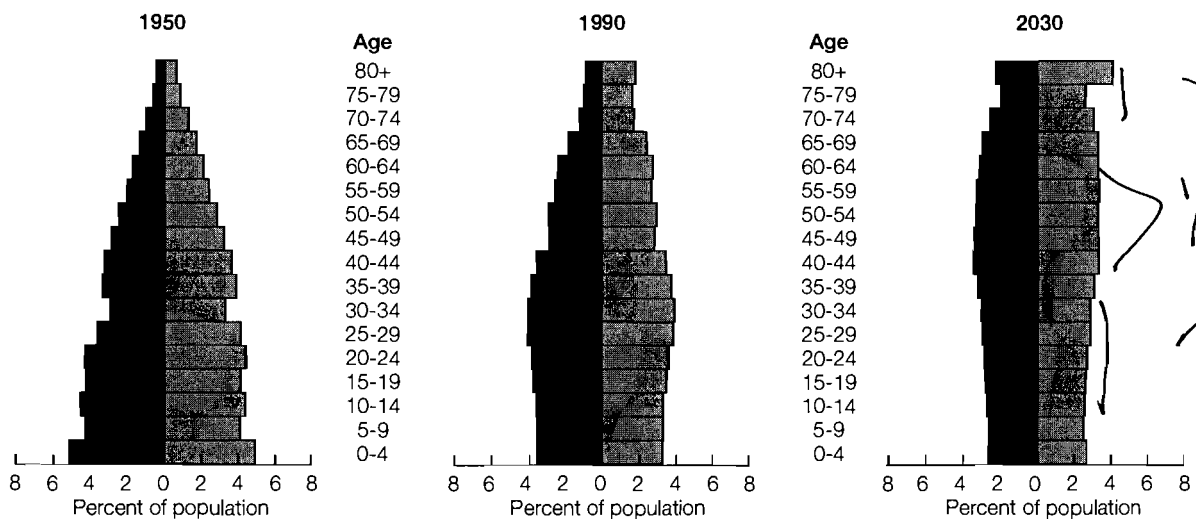
Figure 2

Population Age-Sex Structure in Less Developed and More Developed Countries, 1950, 1990, and 2030

Less developed countries



More developed countries



Source: UN Population Division, *World Population Prospects: The 2002 Revision* (<http://esa.un.org/unpp>, accessed Dec. 9, 2004).

opments have added new wrinkles to what was once expected to be a monotonic march toward aging.

Compression of Aging

One of the most surprising demographic developments in the last two decades has been the pace of fertility decline in many less developed countries. The common perception is that below-replacement fertility levels are seen only in the industrialized nations of the Northern Hemisphere. As of 2002, however, the TFR was below replacement level in 33 less developed countries—mostly in Latin America and the Caribbean and parts of Asia—and is declining steeply in many others. The demographic effects of fertility decline have been most dramatic in some highly populous Asian countries because of the rapidity of the decline in these countries.

Aging has proceeded more gradually in Western nations. It took 115 years for the proportion of France's population age 65 or older to increase from 7 percent to 14 percent (see Figure 3). Most other more developed nations have had many decades to adjust to this structural change. Japan is the major exception, where this same increase occurred in just 26 years. A similarly rapid trajec-

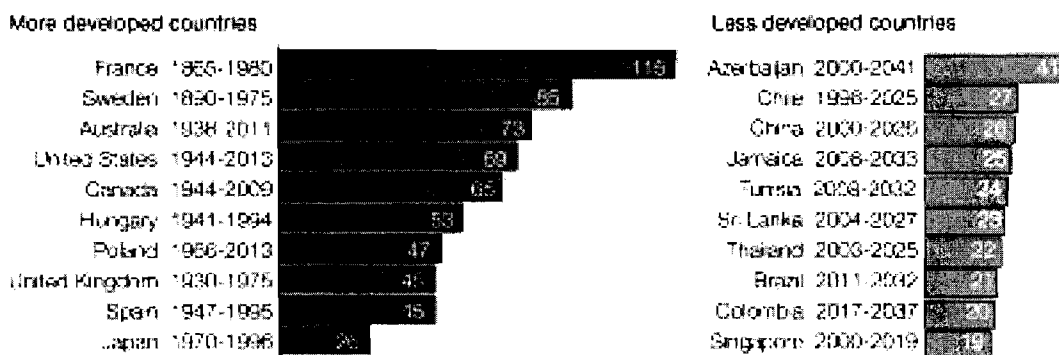
tory is underway elsewhere in East and Southeast Asia (especially China, South Korea, Taiwan, and Thailand), fueled by dramatic and relatively recent drops in fertility. Such rapidly aging non-Western societies are beginning to engage in the same debates about public pension and health care costs that have become common in Europe and North America.

The People's Republic of China illustrates how rapidly declining fertility affects population aging. China's TFR plummeted from about 6.0 in 1965 to near-replacement level by 1990 and to 1.7 by 2002. The decline was reinforced by strict birth planning policies enacted in the late 1970s. Consequently, China will age sooner and more quickly than most less developed countries. China's age profile in 2002 contained a large "bulge" consisting of people ages 28 to 39. The oldest people in this age bulge will be entering their 60s just prior to 2025, signaling a rapid aging of the Chinese population in the third and fourth decades of the 21st century. The number of Chinese ages 65 and older is projected to swell from 88 million in 2000 to 199 million in 2025—and to 349 million in 2050, barring a catastrophic rise in adult mortality or massive emigration.

Figure 3

Speed of Population Aging in Selected Countries

Number of years required or expected for percent of population age 65 or older to rise from 7% to 14%



Note: Dates show the span of years when percent of population age 65 or older rose (or is projected to rise) from 7 percent to 14 percent.

Source: K. Kinsella and Y.J. Gist, *Older Workers, Retirement, and Pensions: A Comparative International Chartbook* (1995); and authors' calculations.

There are unique features of African societies that affect older people.

Recognizing this near-certain surge, the central Chinese government and various local governments are struggling to establish alternative forms of pensions to provide for what is still a predominantly rural nation. Some analysts and policymakers are calling for an easing of birth restrictions to slow the pace of aging.

Slow Structural Aging

In stark contrast to the rapidity of aging in other parts of the less developed world, most of sub-Saharan Africa remains in an intermediate stage of demographic transition. Fertility and mortality rates are quite high by global standards, and the regional age structure is changing only gradually. Women in sub-Saharan Africa still bear nearly 5.5 children on average, compared with 2.8 in North Africa and 2.4 in Asia. Although infant and maternal mortality are also comparatively high, the large numbers of babies born each year ensure that the base of sub-Saharan Africa's population pyramid will remain quite broad. At the same time, life expectancy at birth for the region is approximately 50 years, 13 years below the average for all less developed countries. The scourge of HIV/AIDS has pushed average life expectancy below 40 years in some sub-Saharan nations. "Old age" in Zimbabwe or Mali has a very different chronological interpretation than in Switzerland or Japan.

The proportion of older people in Africa is expected to increase only modestly in the coming decades, although the absolute number of older people will rise steeply. While aging as a sociopolitical issue is not a high priority for most African governments, there are unique features of many African societies that bear directly on older people. One is the impact of HIV/AIDS (discussed later), which thrusts older adults back into the role of primary child providers. Another is the rapidly growing number of widows and the role that polygyny may play in their

well-being or lack thereof. Also, sub-Saharan Africa is the most rapidly urbanizing world region, and the implications of migration patterns for the well-being of older Africans are not well understood.

Aging and Depopulation

The world is witnessing a new and unprecedented demographic phenomenon: simultaneous population aging and an overall decline in the total size of some national populations (see Box 2). European demographers have sounded warning bells for at least 30 years about the possibility of declining population size in industrialized nations. But this idea had not resonated in public discourse until recently. Many in these societies were aware that their populations were aging, but they often did not equate aging with population decline. In the last several years, the awareness of potential population decline has increased considerably, in large part because of reports suggesting that populations in much of Europe and Japan will decrease in size over the next 50 years, and because of publicity generated by recent actual population declines in Spain, Italy, Russia, and other nations.

Projections to 2030 suggest that 11 countries are expected to lose at least 1 million people within 30 years. Russia tops the list with a projected decline of 12 million, followed by Japan with 11 million. Not all population declines will result from persistently low fertility. South Africa is projected to have 10 million fewer citizens in 2030 than it does today because of HIV/AIDS mortality. By and large, however, aging and depopulation will be a European phenomenon.

Divergence in Life Expectancy

In the 1950s, female life expectancy continued its rise everywhere, but gains among males slowed significantly and in some cases leveled off. From the early 1950s to the early 1970s, for example, male life expectancy

changed little in Australia, the Netherlands, Norway, and the United States, before resuming a modest increase.

In eastern Europe and the former Soviet Union, advances in living conditions and public health policies produced large declines in mortality in the 1950s and early 1960s. Some major causes of death, such as tuberculosis, were reduced to minimal levels. Gains in life expectancy in excess of five years per decade were common. The rate of increase in life expectancy fell sharply in the mid-1960s, however. Changes in female life expectancy at birth were erratic during the next two decades, while male life expectancy fell throughout the region. The political and economic collapse of the former Soviet Union undermined public health and led to severe declines in life expectancy, especially for Russian men. Between 1987 and 1994, life expectancy at birth for Russian males

plunged 7.3 years to 57.6 years and has not fully recovered. The large increases in adult male mortality usually are attributed to a combination of factors, including increased homicide and accident rates, excessive alcohol consumption, poor diet, and environmental/workplace degradation.¹⁶ Research on indicators of social capital in Hungary suggests that gender differences in social support systems also play a role; support systems for men appear strained by changes in Hungarian society, while traditionally close-knit networks among women remain relatively unchanged.¹⁷

In parts of Africa, the HIV/AIDS epidemic has devastated life expectancy at birth, reflecting the concentration of AIDS deaths there in childhood and the middle adult ages. U.S. Census Bureau projections to the year 2010 imply that AIDS will reduce life expectancy at birth by more than 30 years from otherwise-expected levels in

Box 2

Aging and Depopulation

Is persistent below-replacement fertility a threat to European and other societies, and if so, how might it be altered? Should so-called "replacement migration" be encouraged to offset population aging?

There are no straightforward answers to these questions. A number of theories attempt to explain modern-day levels of low fertility, focusing on concepts such as risk aversion, materialist values, and gender equity.¹ One study that examined a diverse set of countries that have made the transition to low fertility found very few countries in which fertility stabilized above two children per woman.² Such an occurrence would require substantial proportions of third or higher-order births, but higher-order births are largely anachronistic in industrial-country settings. The tentative conclusion was that fertility is unlikely to rebound significantly, though we should remember that few demographers anticipated the post-World War II baby boom that will soon accelerate population aging.

Governments in low-fertility countries have employed various means to increase fertility, including direct financial incentives for additional births; tax reductions; indirect pension (early retirement) or in-kind benefits such as preferential access to subsidized housing; more liberal maternity and paternity leave and childcare arrangements; and legislation promoting gender equity in employment. These

policies have had modest impacts in authoritarian states, but only minimal impacts in liberal democracies such as France and Sweden.³

In 2000, a United Nations study concluded that immigration was not a realistic counterbalance to aging for avoiding population decline.⁴ UN experts found that immigration could buffer the impact of aging if used by governments in conjunction with other policies, such as measures to encourage higher fertility or to increase labor force participation, especially among women.

References

1. Peter McDonald, "Sustaining Fertility Through Public Policy: The Range of Options," *Population* 57, no. 3 (2002): 417-46.
2. National Research Council, *Beyond Six Billion: Forecasting the World's Population*, ed. John Bongaarts and Rodolfo A. Bulatao (Washington, DC: National Academies Press, 2000).
3. Michael S. Teitelbaum, "Long-Range Demographic Projections and Their Implications for the United States," in *United Nations Expert Group Meeting on Policy Responses to Population Ageing and Population Decline*, ed. United Nations (UN) Population Division, ESA/P/WP.163 (New York: UN, 2000): 17/1-11.
4. UN Population Division, *United Nations Expert Group Meeting on Policy Responses to Population Ageing and Population Decline*.

Botswana, Namibia, South Africa, and Zimbabwe. The epidemic also can have a significant impact on older populations. In the United States in 2000, the HIV-death rate among people ages 65 to 74 was more than four times as high as among youth ages 15 to 24.¹⁸

Intranational Differences

In addition to global and regional differences in aging, important differences may play out within nations as well. Census data for Brazil show that, while the overall national aging index was 14 in 1991, the index ranged from less than 6 in several northern states to 21 in the state of Rio de Janeiro. In the United States, more than one-third of the population in some counties is age 65 or older. In 2003, 17 percent of Florida's residents were at least 65 years old.

In many countries, older people are becoming concentrated in rural areas as young adults leave rural areas for the cities and some older urban migrants return to rural communities as they reach old age. Older women are more likely than older men to live in rural areas, causing an imbalanced age-sex distribution. In the Russian region of Kursk, for example, nearly 31 percent of rural females are age 65 or older, compared with just 15 percent of rural males.

Skewed age structures complicate the provision of services for older people in some localities. Based on the experiences of Japan and Korea, demographer Ronald Skeldon has noted that overall population aging coincides with rural depopulation and population stagnation in small- and medium-sized towns, and suggests that this pattern will increasingly be seen throughout Asia in the first half of this century.¹⁹ A similar phenomenon has been identified in Italy.²⁰ While few if any negative national economic consequences are associated with the concentration of older people in rural communities, social conditions in relatively isolated rural areas are likely to require increasing attention by policymakers.

Health Transitions

The global phenomenon of population aging is directly related to a fundamental *health transition* that has been occurring throughout the world at different rates and along different paths. The health transition—also called the *epidemiological transition*—is defined by a broad set of changes that include a shift from high to low fertility, steady expansion of life expectancy at birth and at older ages, and a transition from the predominance of infectious and parasitic diseases to the growing importance of noncommunicable diseases and chronic conditions. The health transition has been linked to modernization and urbanization, especially improvements in standards of living and education. As Russia's recent erosion in life expectancy illustrates, health transition gains can be lost as national economies and public services stagnate and even regress because of social, political, or economic upheavals.

The health transition is allied with the *demographic transition* that began in more developed countries during the 18th and 19th centuries as populations shifted from high to low mortality, thanks to better health and nutrition. As death rates fell, population growth surged until birth rates dropped, eventually falling close to—or even below—the level of death rates. This transition took at least 100 years in most of Europe and the United States. While many less developed countries have not completed the transition to low birth and death rates and slow population growth, many have passed through some of the same stages of falling mortality, rapid population growth driven by high fertility, and then falling fertility and slower population growth.

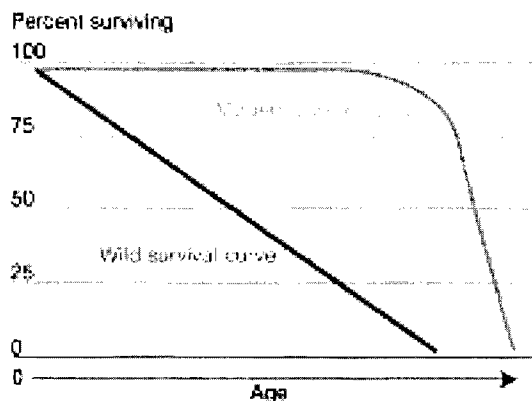
The epidemiological transition was originally conceptualized as a three-stage process that paralleled the later stages of demographic transition. An Age of Pestilence and Famine was succeeded by an Age of Receding Pandemics and then an Age of Degenerative and Man-Made



Diseases. A fourth stage has been recognized in recent decades—a hybrid stage in which some social and geographic factors affect the health of specific population groups. Behaviors and lifestyle obviously influence health status, and health practitioners are increasingly concerned about rising ill health and mortality from what are sometimes called social pathologies: cirrhosis, substance abuse, obesity, suicide, homicide, HIV/AIDS, and resurgent diseases such as drug-resistant tuberculosis and other strains of infectious diseases. New emerging infectious disease variants can be especially risky for older people, who are more vulnerable than younger people to acute respiratory diseases. For example, the outbreak in many countries in 2003 of SARS (severe acute respiratory syndrome) affected older people disproportionately. In Hong Kong, people ages 65 and older accounted for 19 percent of the reported 1,755 SARS cases in 2003. More important, the older population was hit much harder with fatalities in the epidemic; nearly two-thirds of the 300 SARS deaths in Hong Kong were among older people.²¹

While communicable diseases still exact a toll—especially among older people—the broad decline in mortality from infectious diseases and the rising importance of chronic diseases has delayed deaths until older and older ages. The epidemiological transition shifts the *human survival curve* that depicts people's chance of surviving another year as they age. In a so-called "wild" survival curve that likely characterized nonindustrial, pre-demographic transition societies, the risk of death remains relatively constant throughout life, and only a small proportion of those born reach old age. Modern survival curves, particularly in highly industrialized societies, are much more rectangular, as most people live past middle age and deaths are highly concentrated at older ages (see Figure 4). The UN calculates that, for more developed countries, 86 percent of people born today will survive to age 60 (91 percent for

Figure 4
Stylized Wild and Modern Survival Curves



females, 81 percent for males); almost one-half of people born today can expect to reach age 80.

How healthy can these older people be? This question underlies one of gerontology's great debates and has generated varied attempts to quantify the health of older people. The answers have important policy implications because they influence the health and social care needs and residential options for older people.

The health profile of older people spans a wide spectrum: Some people live long and healthy lives, while others experience the "creaking door" syndrome of longer life but gradually deteriorating health. Most analysts think that some combination of genetic factors and lifestyle explains much of the variation in health at older ages. While some people operate at full capacity into very old age, many older people begin to have difficulty with at least some common daily activities. When do such difficulties become so limiting that an individual is considered disabled or handicapped? The definition is not always clear-cut, but it is important on a variety of levels.

Measuring Disability

Disability is often visualized as a process, as depicted in Figure 5, page 18. Many analysts claim this model

Figure 5
Progression of Disability



Several measures of disability for older Americans have shown improvement.

oversimplifies the complexity of disability and function. In its International Classification of Impairments, Disabilities and Handicaps (ICIDH), the World Health Organization (WHO) takes the model a step further, proposing three possible outcomes of disease: *impairment*, *disability*, and *handicap*. Impairment refers to the performance of an organ or part of the body, whereas disability refers to the performance of an activity by a person. Not all impairments will lead to disability, such that a functionally limited person may still be able to carry out all normal activities independently. The distinction between disability and handicap is determined by severity and situation. WHO considers a handicap to be a disadvantage due to an impairment or disability that limits or prevents a person from fulfilling a normal role. There is wide international variation in the definition and application of the ICIDH concepts.²² However, the framework is useful for assessing how assistance (either personal or mechanical) can prevent a disability from becoming a handicap that, for example, prevents a person from fulfilling the role of a spouse or grandparent.

More specific measures of the range of disability a person might experience are used to assess needs for medical care and general assistance. Two widely used (but imperfect) means of measuring a person's difficulty in performing personal care and home management tasks are ADLs (Activities of Daily Living) and IADLs (Instrumental ADLs). ADLs gauge the extent to which a person can manage personal care activities such as eating, moving from a bed or chair, bathing, dressing, toileting, and walking. IADLs refer to home man-

agement activities such as using the phone, shopping, dealing with personal finances, and light housework. These measures assess the ability of people (older people in particular) to live independently; they are also used to indicate the need for health and social services. Results from the several types of ADL and IADL scales used to estimate disability prevalence—including Katz, Barthel, and Puses—can differ by as much as 60 percent.²³ By any measure, however, ADL and IADL problems increase with age. Data from the Berlin Aging Study showed that, among people ages 70 to 84, 9 percent needed help with bathing, 6 percent needed help climbing stairs and going for walks, and 4 percent needed help with dressing. In the 85-and-older age group, 46 percent needed help with bathing, 33 percent with climbing stairs, 34 percent with going for walks, and 18 percent with dressing. Roughly 20 percent of the younger-old needed assistance with shopping and transportation, while more than 70 percent of people age 85 or older either needed help with or were unable to do these activities.²⁴

There is no simple correlation between disability-free life expectancy and life expectancy. International disability figures often are not comparable because of differences in definitions, concepts of disability, and computational methods. Even within Europe, countries show wide variations in self-reported levels of severe or any disability. For example, against a standardized relative risk of severe disability of 100 for the older populations in eight countries, the United Kingdom and Denmark had a risk of around 70 while the level in France exceeded 140. Life expectancy at age 65 in the

United States and the United Kingdom is similar, but rates of disability appear much lower in the United Kingdom; consistent with this disparity, the percentage of the population 65 or older receiving formal home care is almost three times higher in the United States. However, the percentage of overall expenditure on home care as a proportion of gross domestic product (GDP) is similar in the two countries.²⁵ One international effort to harmonize disability measures indicates that, in most countries, the expectation of life without *severe* disability for older people is gradually increasing and sometimes at a similar rate to increases in life expectancy.²⁶ A rigorous review of eight surveys in the United States concluded that several measures of disability for older Americans have shown

improvement in the past decade.²⁷ Less developed countries eye disability data from the more developed world with interest, as many countries are rapidly catching up in life expectancy but have little insight into the health of their older populations. Even if rates of disability can be reduced or the onset postponed, demographic trends will almost inevitably increase the numbers of disabled older people in less developed countries, especially when the numbers with dementia are included (see Box 3).

Compression of Morbidity

Related to the discussion of changing incidence and prevalence of disability is the debate on “compression of morbidity,” which was articulated by James

Box 3

The Challenge of Alzheimer's Disease and Other Dementias

Dementia is a growing concern around the world as populations age. Dementia is an acquired syndrome that eventually destroys memory, reasoning, speech, and other cognitive functions. A crossnational study conducted by the Organisation for Economic Cooperation and Development (OECD) found that dementia affected about 10 million people in OECD member countries, just under 7 percent of people age 65 or older. But the prevalence increases sharply with age and threatens to transform dementia into a health care crisis in the world's aging populations.¹

Dementia prevalence estimates vary considerably internationally, in part because of variations in diagnoses and reporting systems. The syndrome is not easy to diagnose, especially in its initial stages. The memory problems, misunderstandings, and inappropriate behavior common in the early and intermediate stages are often attributed to normal effects of aging, accepted as personality traits, or simply ignored. Many cases remain undiagnosed even in the intermediate, more serious stages.

Alzheimer's disease (AD) is the most common form of dementia. AD accounted for between two-fifths and four-fifths of all dementia cases in the OECD study. The prevalence of AD and other dementias is very low at younger ages but increases with age; the prevalence nearly doubles with every five years of age. In the OECD study, for example, dementia affected fewer than 3 percent of those ages 65 to 69, but almost 30 percent of those ages 85 to 89. Among women age 90 or older, more than 50 percent had

dementia in France and Germany; corresponding levels were around 40 percent in the United States and just under 30 percent in Spain.

There are no effective treatments for dementia. Family members often play a key part in the care, especially in the initial stages of what is often a relatively slow and distressing decline in a loved one. The complexity of the disease and the wide range of family and housing settings can make helping people and families with dementia very difficult. However, it is a challenge that must be faced in health and social care worldwide, especially with increasing numbers of people surviving past age 85. While industrialized countries have struggled to cope with the mounting financial and social burdens of AD, the challenge is even greater in the less developed world, where at least two-thirds of dementia sufferers are thought to live but where far fewer coping resources are available.²

References

1. Antonio Lobo et al., “Prevalence of Dementia and Major Subtypes in Europe: A Collaborative Study of Population-Based Cohorts,” *Neurology* 54, no. 11 (2000): S4-9; and Pierre Moise et al., “Dementia Care in 9 OECD Countries: A Comparative Analysis,” *OECD Health Working Papers* 13 (Paris: Organisation for Economic Cooperation and Development (OECD), 2004).
2. Martin Prince, “Dementia in Developing Countries: A Consensus Statement From the 10/66 Dementia Research Group,” *International Journal of Geriatric Psychiatry* 15, no. 1 (2000): 14-20.

Table 3

Ten Leading Sources of the Global Burden of Disease, 1990 and 2020

Rank	1990 Disease or injury	2020 Disease or injury
1	Lower respiratory infections	Ischemic heart disease
2	Diarrhoeal diseases	Unipolar major depression
3	Conditions arising during the perinatal period	Road traffic accidents
4	Unipolar major depression	Cerebrovascular disease
5	Ischemic heart disease	Chronic obstructive pulmonary disease
6	Cerebrovascular disease	Lower respiratory infections
7	Tuberculosis	Tuberculosis
8	Measles	War
9	Road traffic accidents	Diarrhoeal diseases
10	Congenital anomalies	HIV/AIDS

Note: These estimates of disease burden as measured by disability-adjusted life years are from the Global Burden of Disease Study conducted by the World Health Organization, the World Bank, and Harvard University in the 1990s. Many countries and agencies have modified the study methodology; further refinements are being tested in a project spearheaded by the Harvard University Burden of Disease Unit. More information is available at www.hsph.harvard.edu/organizations/bdu/About.html.

Source: C.J.L. Murray and A.D. Lopez, eds., *The Global Burden of Disease* (1996).

Fries and others in the 1980s.²⁸ Projections of future burdens of illness depend on which of two contrasting scenarios may hold true. In the first, average life expectancy at birth increases, but the average age at which a person becomes chronically ill does not. In the second scenario, life expectancy increases, and the average age of the onset of chronic illness also rises.

In the extreme, chronic illness occurs only in the final years or even months of life. This extreme scenario is known as the *compression of morbidity*. Data from the United States lend some support to the compression of morbidity hypothesis: The rate of chronic disability among older Americans declined between 1982 and 1999, and there were 25 percent fewer chronically disabled older Americans than there would have been if the U.S. disability rate had not changed since 1982.²⁹ If health improves alongside mortality (that is, if there is a compression of morbidity), health and social welfare costs will be very different than they would be if disability rates do not fall. In most countries, however, the shortage of data on disability across time, on social groups, and by generation and age greatly hamper attempts to

understand the causal factors that underlie these changes.

The Global Burden of Disease

In a landmark study in the 1990s, the WHO, World Bank, and Harvard University attempted to estimate the current and future global burden of major diseases. This Global Burden of Disease project has been extended to look at the burden of disease and aging.³⁰ Earlier results from the study indicate that, between 1990 and 2020, the leading causes of disease burden in the world as a whole will shift from lower respiratory conditions, diarrhoeal diseases, and perinatal conditions to ischemic heart disease, unipolar major depression, and road traffic accidents (see Table 3). The study also projects that cerebrovascular disease will make its way up the list, and that HIV will reach the top 10 leading causes of disease burden by 2020. These trends—especially the increased impact of mortality and morbidity from HIV/AIDS—will have important implications for older people and their families (see Box 4).

While the Global Burden of Disease study has attracted criticism, it has clearly prompted a valuable analysis of

Box 4

The Impact of HIV/AIDS on Older People in the Less Developed World: African and Asian Examples

The World Health Organization (WHO) and the Joint United Nations Programme on HIV/AIDS (UNAIDS) estimated that 18.8 million people had died of AIDS by 2001. Of these, 14.8 million were in sub-Saharan Africa. An estimated 37 million people were living with HIV, and 95 percent of new infections were occurring in less developed countries.¹ The rising AIDS toll and the consequent increasing numbers of AIDS orphans worldwide are having far-reaching health, economic, and psychosocial impacts, particularly in Africa and increasingly in parts of Asia. Of the 14 million children under age 15 who had lost their mother or both parents to AIDS, about 90 percent lived in sub-Saharan Africa. The care and support of HIV/AIDS patients often fall on older parents and grandparents.

A study in Zimbabwe found that older people were the main caregivers, either of the terminally ill or of the orphans whose parents had died of AIDS.² Caregivers faced a range of problems, including loss of financial support; lack of food and clothing; limited access to affordable health services; inability to pay school fees; diminished livelihood opportunities; and stigmatization of the disease (even from health personnel). Similar findings have been reported in Uganda.³ The Zimbabwean study found that the health of older caregivers had often suffered, with many under serious physical and emotional stress and suffering from physical violence and abuse resulting from accusations of witchcraft. Respondents had many serious concerns, as voiced by a 62-year-old woman, guardian of three grandchildren: "I am so afraid of what the future has in store for these orphans. If I were to die and leave them, who would look after them?"

A 59-year-old woman in Mbare, Zimbabwe, who cared for her children before they died and now cares for seven orphaned grandchildren, explained: "The person with AIDS is very sick and at times loses his/her mind. When this happens, it becomes impossible to provide effective care, as the sick person may be abusive and violent."

While HIV/AIDS now affects sub-Saharan Africa disproportionately, the epidemic is expected to place a heavy burden on older caregivers in a number of Asian countries, including Thailand, India, Cambodia, China, and the Philippines. A Thai study found that two-thirds of adults who died from HIV/AIDS lived with or had moved near their parents by the terminal stage of illness.⁴ Seventy percent of these adults received at least some care from a parent or other older-generation relative. Such extensive involvement of older caregivers may serve as a model for planning public health programs in other less developed nations—targeting older people with caretaker education and socioeconomic support of people living with HIV.

References

1. Peter Lamprey et al., "Facing the HIV/AIDS Pandemic," *Population Bulletin* 57, no. 3 (2002).
2. World Health Organization (WHO), *Impact of AIDS on Older People in Africa: Zimbabwe Case Study* (Geneva: WHO, 2002).
3. Alun Williams and Grace Tumwekwase, "Multiple Impacts of the HIV/AIDS Epidemic on the Aged in Rural Uganda," *Journal of Cross-Cultural Gerontology* 16, no. 3 (2001): 221-36.
4. John Knodel et al., "Older People and AIDS: Quantitative Evidence of the Impact in Thailand," *Social Science and Medicine* 52, no. 9 (2001): 1313-27.

disease factors and health system responses. One important component of older people's living standards is health care and its costs. As costs have escalated in the past decade, a growing body of research has focused on identifying the costs of specific illnesses and on projecting health expenditures.³¹ The WHO's *World Health Report 2002* was devoted to identifying, quantifying, and reducing disease risk factors. Data from the European Community Household Panel Survey in the 1990s began to shed light on the interplay between health status and the retirement decisions of older European couples. Several ongoing national longitudinal studies, includ-

ing the Health and Retirement Study in the United States and the English Longitudinal Study of Ageing in the United Kingdom, also attempt to capture the complexity of such transitions and understand their significance for policy planning. Several other nations have mounted similar longitudinal studies to track these issues.

Gender and Aging

Women constitute a majority of the older population in almost every country, and their majority increases with age. The gender imbalance at older ages has many implications for

population and individual aging, perhaps most important with regard to marital status and living arrangements. Family members are the main source of emotional and economic support for older people in less developed countries, although some governments have assumed a larger share of the economic responsibilities.

The primary reason there are many more women than men at older ages is that men have higher death rates than women at all ages. Although about 105 boys are born per 100 girls in most populations, women usually begin to outnumber men between ages 30 and 40. The female numerical advantage increases with age. A precise explanation of why women live longer than men still eludes scientists because it involves the complex interplay of biological, social, and behavioral conditions. Greater exposure of males to risk factors such as tobacco and alcohol use and occupational hazards is cited as one source of higher male mortality rates. If this is true, the gap in life expectancy should have narrowed as women increased their use of tobacco and alcohol and their participation in the labor force. Data from industrialized countries still show no clear pattern of change. The gender gap is widening in much of eastern Europe and the former Soviet Union, while it is narrowing in most other countries. In the United States, for

example, life expectancy at birth increased 4.4 years for males and 2.3 years for females between 1980 and 2002, narrowing the gender gap from 7.5 to 5.4 years. But in some nations with high overall life expectancy (for example Japan, Greece, and Iceland), gains in female longevity continue to outpace those of males.

Sex Ratios

In most countries of the world, the ratio of men to women at older ages is well below 100. Ukraine's sex ratio of 50 men per 100 women ages 65 and older is an extreme example, partly attributable to the lingering effects of high male mortality during World War II. More developed countries tend to have lower sex ratios among their older populations than do less developed countries, reflecting the wider gender differentials in life expectancies at birth in more developed countries (see Table 4).

In the future, sex ratios at older ages are projected to move in opposite directions in the more developed and less developed regions. These ratios are expected to increase in the next few decades in many industrialized countries as their life expectancy gender gap narrows. The opposite trend is anticipated in less developed countries. Given the small average gender gap in life expectancy in less developed countries relative to more developed nations, most demographers expect to see a widening of the female/male difference in upcoming decades, along the lines of the historical trend in industrialized nations. Many less developed countries are experiencing increases in alcohol and tobacco consumption and vehicular and industrial accidents—all of which tend, at least initially, to adversely affect men more than women.

Education is also related to the gender gap. As women "catch up" to men in terms of educational attainment, female survival and health status may improve.³² Regardless of the projected trends, women are expected to make up the majority of the

Table 4
Sex Ratio for People Age 65 or Older in 20 Countries, 2004

More developed countries		Less developed countries	
Australia	79	Bangladesh	117
Bulgaria	72	Brazil	70
France	69	Ethiopia	84
Germany	68	Fiji	85
Italy	71	Ghana	89
Poland	62	Honduras	90
Russia	46	India	103
Ukraine	51	Iran	98
United Kingdom	74	Mexico	84
United States	71	Zambia	79

Note: The sex ratio reflects the number of men per 100 women in the 65-and-older age group.

Source: U.S. Census Bureau, International Data Base (www.census.gov/ipc/www/idbnew.html, accessed Dec. 12, 2004).

world's older population throughout the 21st century. Continuing or growing disparities in sex ratios mean that many of the challenges and problems faced by older people of today and tomorrow are, in essence, challenges and problems faced by older women.

Marital Status

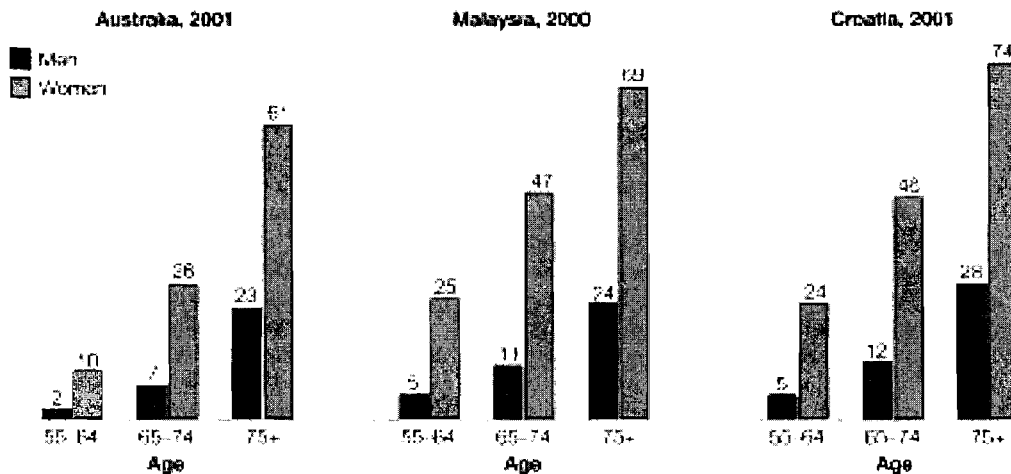
Married people, particularly married men, enjoy healthier and longer lives than their unmarried counterparts. A recent study of the U.S. noninstitutionalized population found that married adults were healthier than unmarried adults within every population group (including age, sex, race, or ethnic groups) and within groups with similar health indicators (whether they were smokers, disabled, or physically inactive, for example). The only negative health indicator for which married adults had a higher prevalence was being overweight or obese.³³

Older married couples also tend to be more financially secure than unmarried people. Married older people are less likely to enter a nursing home because their spouses are often available to care for them in case of illness or disability. Changes in marital status at older ages can affect pension potential, retirement income, and an

individual's social support network; older widowed men, in particular, may lose contact with much of their support network after their wives die. By contrast, widowed women tend to maintain their support network after the death of a spouse. In almost every society, older men are likely to be married and older women are likely to be widowed. For both men and women, the proportion married decreases with older age and the proportion widowed increases (see Figure 6).

Gender differences in marital status reflect the interplay of several factors. First and most obvious is the sex difference in longevity: Women live longer than men. Second, women tend to marry men older than themselves which, combined with the sex difference in life expectancy, increases the chance that a woman's husband will die before she does. Furthermore, older widowed men have higher remarriage rates than older widowed women in many countries, often as a function of cultural norms.³⁴ Thus, women are more likely than men to lose their spouse and less likely to remarry if they are widowed. This preponderance of single women in older ages has important economic consequences for individuals and societies. Longitudinal data

Figure 6
Percent Widowed Among Older Australians, Malaysians, and Croatians, Circa 2000



Source: Compiled by the U.S. Census Bureau from national sources.

from Germany and the United States have revealed that, although the poverty rate is lower in Germany than in the United States, women in both nations tend to experience a decline in living standards when they become widows, and many fall into poverty because they lose their husband's pension support.³⁵

Changes in Marriage and Childbearing

Globally, the share of older men and women who are married has increased slightly and the proportion who are widowed has decreased during the past 30 years. Much of this change is attributable to improved joint survival of husbands and wives. In most countries relatively few older people have never married: 5 percent or fewer older men and 10 percent or fewer women. The percentages are somewhat higher in parts of Europe, where World War II deaths shrank the pool of potential husbands when today's older women were of prime marriage age. Above-average proportions of older people in several Latin American and Caribbean nations also are never married, but this largely reflects the prevalence of consensual unions in those societies. While the category "consensual union" is widely used in census tabulations in these countries, some people who are living (or who have lived) in a consensual union are likely to report themselves as never married.

In most countries, a relatively small proportion of older people are divorced, because divorce was less socially acceptable for this earlier generation. The number and percentage of older divorcees will increase as younger cohorts with higher divorce rates reach older age.³⁶ In the United States, for example, 9 percent of people ages 65 and older were divorced or separated in 2003, compared with 17 percent of people 55 to 64 and 19 percent people 45 to 54. The changing marital composition of the older population as these younger cohorts reach age 65 will affect the nature

and types of support services that both families and governments may need to provide.³⁷

Increases in childlessness will also affect future caregiving demands for older people. In the United States, for example, the likelihood of being childless among women ages 40 to 44 nearly doubled between 1980 and 2000 (from 10 percent to 19 percent). Childlessness is common in Europe, and is increasing in Latin America and Southeast Asia. Some childlessness is involuntary, occurring because of marital disruption, birth limitation policies, or infecundity, loss of children to HIV/AIDS or other health problems. But increasingly, people are choosing not to have any children, reflecting lower marriage rates and cultural changes that make childlessness more socially acceptable. Because children often provide support for their parents, trends in childlessness will be an important determinant of future elder-care arrangements.

Educational Differences

While literacy has increased throughout the world, many older people, particularly women and the oldest old, grew up with few educational opportunities. In some less developed countries, the vast majority of older residents, particularly women, are illiterate.

In some more developed countries, younger cohorts are more than twice as likely as older people to have completed secondary education. In less developed countries, the difference between younger and older cohorts is even more striking. The latest census data for Bolivia indicate, for example, that women ages 25 to 44 were more than five times as likely as women age 65 or older to have completed secondary education.

Younger women in many countries now complete secondary education at higher rates than do men, and in some nations young women are about as likely as young men to attend college.³⁸ Thus, the disadvantages that older women face because

they have lower levels of education than men should abate as today's older populations are replaced by more educated cohorts.

While older people in the future will be more educated, the high level of illiteracy among today's older population perpetuates many social and economic disadvantages. A lack of written proof of age, for example, often is enough to bar older people from defending their rights to property.³⁹

Intergenerational Relationships

Intergenerational relationships strictly refer to interactions and relationships between parents, children, grandparents, and grandchildren at the microsocial level. Within families, intergenerational relations often determine the willingness and even the ability of families to provide care and support for their older members. These relations also affect intergenerational transfers of wealth. Intergenerational relations are codified in some societies, especially in Asia, with reciprocal duties between generations viewed as a mutual obligation. These obligations are most readily identified as *filial piety* and, in a more extreme form, ancestor worship.⁴⁰

The expectation that people will care for their older relatives is not unique to Asia; almost every society has a similar, if less formal, understanding of the importance of family relations and the value of older people. While some social analysts suggest that vertical family bonds—tying together different generations—have weakened over recent decades, this suggestion has been refuted by research findings in many countries.⁴¹ Indeed, greater longevity actually makes bonds among adults more important than in the past and, while direct contact between generations may have lessened, indirect contacts are as strong as ever. A heated debate has emerged in many countries about

the so-called “decline of the family.” Some sociologists argue the family has been stripped down to its bare essentials: just two generations and two functions (childbearing and financial and emotional support for nuclear family members). Other analysts argue that, while families have changed over the last century, population aging has actually extended families across generations and expanded their support functions over longer periods.⁴²

Intergenerational relations can be viewed along two axes: solidarity and conflict. Most studies have focused on the solidarity component, which is assumed to remain strong even if social factors such as smaller family size, high residential mobility, and urbanization make intergenerational bonds more difficult to maintain. Researchers recognize various positive aspects of social and familial cohesion, interaction, and sentiment associated with solidarity. Conflict in intergenerational relations has been less thoroughly studied, but research suggests that families alternate between conflict and competition during some periods and stability, order, and cooperation during other periods.

Family Structure

The nature of family life and intergenerational relations strongly depends on the structure of a family: whether one has a spouse, children, grandchildren, siblings, or surviving parents or grandparents. As seen earlier, many women worldwide have a husband or partner until their 60s, when they become widows. Most older people have children and many have grandchildren. As many as 80 percent also have siblings, although this percentage is steadily dropping as family size is falling. In countries with very low birth rates, future generations of adults and older people will have few if any siblings.

The picture of the nuclear family that stays together through life is still the norm in most countries, but this norm is changing. Among the baby-boom generation in the West, there is

A majority of older people in many countries are illiterate.

a wide variety of family forms and lifestyles, reflecting rising rates of divorce and remarriage, delayed marriage, and increasing percentages of never-married and childless adults as well as greater labor force participation among women.

The global trend toward fewer children means fewer potential caregivers for older parents. The word “potential” is important, because simulations of future support scenarios have shown that fertility decline alone is not likely to result in the collapse of a traditional support system.⁴³ Added years of life prolong relationships with others: parents, grandparents, children, and grandchildren. In 2000, a 50-year-old American had an estimated 80 percent chance of having at least one parent alive and a 27 percent chance of having both alive.⁴⁴

Living Arrangements

Living arrangements take on special importance with regard to older people, because living arrangements reflect both the nature of accommodation required and the need for community or institutional long-term care. Living arrangements often reflect sociocultural preferences—for example, a preference for living in nuclear-family households versus living in an extended-family household—or the propensity of society to allow, encourage, and support institutionalization of older people. Living arrangements also reflect the desire and ability of many older people to live independently.

Large proportions of older people live alone in many industrialized countries. Well over one-third live alone in Sweden, the United Kingdom, Finland, and Denmark, and the proportion is higher in the oldest age groups. Figure 7, based on Canadian census data, demonstrates how the increase in the number of older people living alone has largely been fueled by women. Older-person-only households (especially unmarried women) are increasingly common. In the United Kingdom, for example, about

15 percent of all households in the 1990s were single pensioners living alone. However, the most common “older household” in many Western countries consists of two older people. In a comparison of 13 European countries in the 1990s, between 29 percent and 45 percent of all older people lived with another person age 65 or older.⁴⁵ The Berlin Aging Study, which looks at people in West Berlin age 70 or older, found that almost 62 percent were living alone in the 1990s, 25 percent lived with a spouse or partner, and 8 percent lived in nursing homes or other institutional arrangements. Among those age 85 or older, the latter figure was 19 percent.⁴⁶

At one time, living alone was thought to indicate social isolation or family abandonment of older people. However, research in more developed countries consistently shows that older people prefer to reside in their own homes and communities, even if that means living alone. The growth of households consisting of one older person has been fueled by a combination of factors: greater longevity; increases in benefits and pensions; rising home ownership levels; more elder-friendly housing; greater emphasis on care in the community; increased availability of community support; and reduced public financing for living in nursing homes.

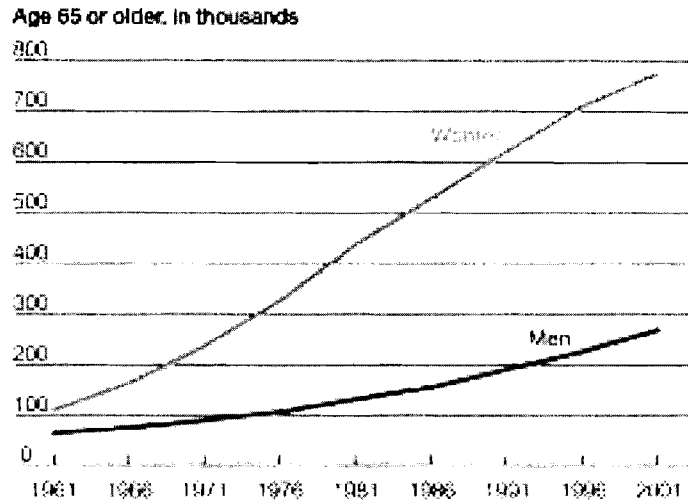
Multigenerational households have been declining in more developed countries, but two- and three-generation households are still the norm in many less developed countries. Most studies in less developed countries indicate that older people want to live with their children or at least close to them. A four-country review of living arrangements and support for older people in Southeast Asia found that between 69 percent and 85 percent of people age 60 or older in those countries lived with their children in the mid-1990s, although the percentage had declined slightly since the 1980s in at least three of the countries.⁴⁷ The percentages who were living alone or with a spouse only were small—6 percent or less. But many

older people who lived apart from their children often lived close by and saw them on a daily basis. The four-country study concluded that the enormous socioeconomic changes in the region over the past few decades have not yet significantly affected traditional living arrangements. However, changes are becoming evident in East Asian countries such as Hong Kong, China, Korea, and Japan, where significant numbers of older people live alone and the share living with children is falling rapidly (see Figure 8).

In patrilineal systems such as found in northern Vietnam, an older parent is much more likely to live with a married son than with a married daughter. The reverse is true in the Philippines and Thailand, where the parent would be more likely to live with a married daughter than a married son.

Although older people in less developed countries appear to have strong family support, several trends concern social scientists. The first trend relates to specific groups such as unmarried older women or widows without any children, who can be left with little support and nowhere to live if extended family members will not take them in. The changing house-

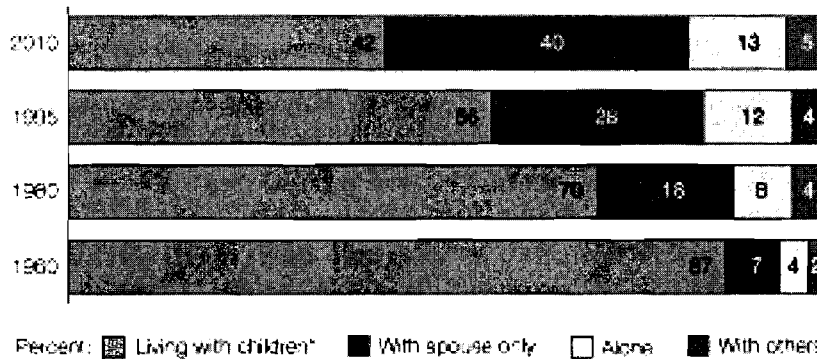
Figure 7
Older Canadians Living Alone, 1961 to 2001



Source: Statistics Canada, national census data.

hold structures and living arrangements in high HIV/AIDS-prevalence areas can leave many orphans dependent on older grandparents. Some social scientists are also concerned about the effects of urbanization and modernization on family life—with some worried that these changes will undermine traditional family support systems for older people.⁴⁸

Figure 8
Living Arrangements of Older Japanese, 1960 to 2010



*Includes small numbers living in unspecified arrangements.

Sources: M. Atoh, "Who Takes Care of Children and the Elderly in an Aging Society?" (October 1998); and Japan National Institute of Population and Social Security Research, "Housing With Seniors: 1975–2010" (www.jin-japan.org/insight/html/focus10/page08.html, accessed March 13, 2003).

Wealthier countries tend to have much lower labor force participation among older residents.

Long-term care (LTC) for older people has become a key issue throughout the world. LTC involves a range of support mechanisms, including nursing and assistance in the home, various forms of community care and day care, residential care, and long-stay hospitals and similar institutions.⁴⁹ Western societies have moved away from institutional residential care except when absolutely necessary for medical or social reasons. One recent study of 10 European nations suggested that the share of older people in residential care ranged from just under 4 percent in Germany to more than 9 percent in Denmark and Norway.⁵⁰ On average, about 6 percent of older people in the more developed world live in residential care communities and nursing homes at any point in time, although a much higher percentage of older people may expect to spend some time in an institutional setting before they die.

Aging in place and *care in the community* have become watch-phrases for policy in many countries. These concepts imply that older people should be able to live in their own homes or in small institutions as long as possible and that, while institutional care should be available when necessary, it should be a last resort. Care in the community and aging in place may remain key policy levers if more older people live longer and healthier lives. However, these options require that appropriate social and medical support are available in the community for older people and their families and that residential settings and local environments are designed to accommodate the special needs of people with limited physical functioning and mobility. Too often, these design aspects are neglected in planning and require considerable expense to install retrospectively.

Caregiving

Caregiving is usually characterized as either formal or informal, although the distinction between the two can at times be artificial. *Formal care* or sup-

port generally comes from paid professionals and public and private services set up specifically to provide a service such as home nursing, home help, or counseling. Some services—such as meals-on-wheels programs for house-bound older people—are formally organized but often delivered partly by volunteers, making these programs a combination of formal and informal support. *Informal care* is care provided by relatives, friends, and neighbors to older people and their families. Much informal care is provided by other older people, and is instrumental (such as help with cooking, cleaning, and shopping); personal (help with eating or toileting); and emotional (personal visits and communication). Such care is extremely important but difficult to quantify because many activities may not be recognized by the giver or receiver as “support” or “care.” Family members are the major providers of informal support: daughters and daughters-in-law are often the primary caregivers. Today, however, increasing joint survivorship at older ages means that the spouse (usually the wife) rather than an adult daughter often is the primary informal caregiver. While many older people receive financial and other support from adult children, support often is reciprocal. In countries with well-established pension programs, many older adults give support and care to their children and grandchildren. Older people in less developed countries are less likely to provide financial help to younger people, but often contribute significantly to family well-being in many ways, ranging from socialization to housekeeping to child care.

Work, Retirement, and Well-Being

No set of issues has galvanized public discourse about aging more than those surrounding work, retirement, and economic security in old age. In eastern Europe’s transitional

economies, and indeed in much of the less developed world, governments increasingly seek to define a balance between public and private social security systems. The precariousness of old-age security can be seen in stagnant and declining real pensions in transitional economies, in the dire fate of pensioners during the collapse of Argentina's economy in 2001, in the surprisingly high poverty rates among older Japanese, and perhaps most vividly in the lack of social safety nets for a majority of older people in Africa and Asia.

Labor Force Participation

Labor force participation declines with age, especially after age 50, but work patterns for older people vary among and within countries (see Box 5, page 30). Older people in more developed countries are generally less likely to work than those in less developed countries. Only 2 percent of men age 65 or older participate in the labor force in some more developed countries, whereas more than one-half are economically active in certain less developed countries. National differences in labor force activity are associated with societal wealth: Wealthier countries tend to have much lower labor force participation rates among older residents than do low-income countries.⁵¹

Labor force participation rates for older men declined in more developed countries in recent decades. One compilation of data for 16 nations showed especially pronounced declines in participation for men in their early 60s. In the early 1970s, well over half of men ages 60 to 64 were still working in a majority of countries. By the late 1990s, only four of the 16 countries—Japan, New Zealand, Sweden, and the United States—had male participation rates over 50 percent in this age group.⁵² Labor force participation rates fell below 10 percent among the 65-and-older age group in most of the countries. Financial incentives for early retirement have enabled many older

workers to leave the labor force. Also, new technologies have increased the value of a recently trained labor force relative to older workers. And in countries with persistently high unemployment, older workers may be pressured to leave the labor force to make room for younger workers.

The decline in labor force participation among older workers may have halted. A report from the Organisation for Economic Cooperation and Development (OECD) found a slight increase in employment rates for men in their late 50s and early 60s in the late 1990s in the United States and the Netherlands, and a cessation of the long-term decline in several other OECD countries. The report suggests that the increase was related to an economic upturn in the late 1990s.⁵³

Older women have had different labor force patterns than older men. In many industrialized countries, female participation rates have increased for almost all adult age groups up to age 60. The increase was sharp in some countries. In New Zealand, for example, 60 percent of women ages 55 to 59 were economically active in 1998, up from 28 percent in 1971. While female participation was increasing at younger ages, nearly all more developed countries saw a decrease among older women between the early 1970s and the late 1990s. Small proportions (typically 4 percent or less) of older women are economically active in more developed nations.

Older men and women in less developed countries are much more likely to work than those in industrialized nations. Older people in predominantly rural agrarian societies often work out of necessity—retirement may be a luxury reserved for urban elites. In nations as diverse as Bangladesh, Indonesia, Jamaica, Mexico, Pakistan, and Zimbabwe, more than 50 percent of all older men are considered economically active. The economic activity of women tends to be underreported, particularly in less developed countries where much of the work that women engage in is not captured in censuses

and labor force surveys, or is not considered economic activity. Older women in less developed societies, for example, often are involved in subsistence agriculture or household industries, neither of which is well documented by conventional data collection methods.

Most older workers in less developed countries work in agriculture. Agriculture remains a major employer of older people, even in many more-developed countries. In 1995 in Japan, one-third of all older workers were engaged in agriculture. Data for 23 OECD countries show that the

ratio of workers age 55 or older to workers below age 55 is generally much higher in agriculture, hunting, and forestry than in any other goods-producing or service sector.⁵⁴

Retirement Systems

Public pension systems developed largely because families found it increasingly difficult to support their older and infirm relatives. Just 33 countries had old age, disability, and survivors programs in 1940, compared with more than 165 countries in 2000. In response to general economic con-

Box 5

The Transition to Retirement

In more developed countries, retirement from the workforce occurred almost exclusively at a regulated age until the 1950s; older workers had little possibility of receiving a pension prior to the designated retirement age. Since then, countries have adopted a wide range of approaches to providing old age security, and people have a wider array of routes to retirement.

Part-time work is one option that appeals to many older workers because it enables them to remain active in the labor force while pursuing leisure activities. But the opportunities for part-time work vary tremendously among countries. In nine more developed countries, the prevalence of part-time employment among working men ages 60 to 64 ranged from less than 8 percent in Italy and Germany to more than 35 percent in Sweden and the Netherlands.¹

Older working women are much more likely than older men to be involved in part-time work. In Australia, three-fourths of women ages 65 and older who were economically active in 1999 worked part-time, compared with fewer than half of economically active older men. A study of 15 European Union countries showed that 41 percent of working women ages 55 to 64 were in part-time positions in 1998, compared with just 8 percent of working men in that age group.² The rate of part-time work for people nearing retirement generally was increasing in the 1990s. However, part-time workers often represent a small fraction of the older population.

Disability programs have provided another path to retirement for older workers. Economic recessions and high unemployment in Europe in recent decades led some governments (including Germany, the Netherlands, and Sweden) to enable early retirement via relaxed disability criteria and generous long-term sickness benefits. Wide variations in national programs produced enormous differences in retirement

patterns; among 16 European countries in the mid-1990s, the percentage of older retired men who retired because of illness or disability ranged from 2 percent in Portugal to 29 percent in Switzerland.

Unemployment also has been seen as a bridge to retirement. Older workers typically have low levels of unemployment compared with younger workers, but if older workers become unemployed, they tend to remain unemployed longer than younger workers. OECD data for several wealthy countries show that well over half of unemployed people age 55 or older were unemployed for more than one year. Many enter the ranks of "discouraged workers," people who are no longer looking for work because they think there is no work available or because they do not know where to look. In some countries, older workers may feel excluded from the labor force because of changes in occupational structure and the need for a more-educated workforce that favors younger workers.

One comparison of 13 countries indicated that people ages 55 to 64 accounted for a disproportionate share of discouraged workers, especially in the United Kingdom, where more than two-thirds of all discouraged male workers were ages 55 to 64. In countries with trend data, discouraged older workers were more numerous in the 1990s than in the 1980s. Because of the difficulties older people face in obtaining a new job, discouragement often becomes a transition from unemployment to retirement.

References

1. Organisation for Economic Cooperation and Development (OECD), *Reforms for an Ageing Society* (Paris: OECD, 2000).
2. Statistical Office of the European Communities (EUROSTAT), *The Social Situation in the European Union 2000* (Luxembourg: EUROSTAT, 2000).

ditions, changes in welfare philosophy, and private pension trends over the past several decades, many industrialized nations lowered the age at which people become fully entitled to public pension benefits. The proliferation of early retirement schemes has increased the number and usually the proportion of older workers who take advantage of such programs.

Coverage

Mandatory old-age pension plans now cover more than 90 percent of the labor force in most industrialized countries. Governments are responsible for mandating, financing, managing, and insuring public pensions. Public pension plans usually offer benefits that are not tied to individual contributions, but are financed by payroll taxes. This arrangement is commonly referred to as a “pay-as-you-go” system because taxes on working adults finance the pension payments of people who are retired.

Most pay-as-you-go systems in industrialized countries initially promised generous benefits. When first established, these programs were based on a small number of pensioners relative to a large number of contributors (workers). As systems matured, ratios of pensioners to contributors grew and in some countries became unsustainable, particularly during periods of economic stagnation. One result was the development of private pension systems to complement public systems. Other measures implemented or considered have included increasing worker contribution rates, restructuring or reducing benefits, and raising the minimum age of retirement.⁵⁶

In less developed countries, public pension systems typically cover a much smaller fraction of workers. Even economically vibrant societies such as Malaysia and Thailand offer no publicly supported, comprehensive retirement pension scheme. Governments that do offer coverage often restrict it to certain workers such as civil servants, military personnel, and employees in the formal economic sector. Rural, predominantly agricultural

workers have little or no pension coverage in much of the less developed world, although some governments have taken steps to address this situation.⁵⁶ Each state in India, for example, has implemented an old-age pension scheme for destitute people with no source of income and no family support. In addition to these state schemes, the Indian government has developed a means-tested National Social Assistance Programme that seeks to provide uniformly available social protection throughout the country. While pension amounts are minimal and coverage far from universal, the system provides a foundation on which to expand future coverage.

Informal (usually family) systems provide the bulk of social support for older individuals in many countries, particularly in Africa and South Asia. As economies expand and nations urbanize, informal support systems, such as extended family care and mutual aid societies, have tended to weaken. Expanding the older population served by formal systems while maintaining the existing informal support mechanisms has become a major challenge for governments in less developed nations.

Pension Reform

A number of factors have converged to make pension reform a contentious political issue. Increased longevity and early retirement mean that demographic change alone could double retiree-worker ratios in many countries over the next 30 years.

Economists have expressed concerns about declining savings rates, while politicians and the general public have been reluctant to embrace increased payroll taxes and higher retirement ages.⁵⁷ With the cost of public pensions absorbing upwards of 15 percent of GDP in some countries, there is an emerging consensus that pension systems should be revamped to rely less on traditional public-benefit formulas and to require more from private accounts and individual-worker savings.⁵⁸ During the last decade, dozens of books and monographs

have debated the often-complex fiscal pros and cons of privatization. There also are strong philosophical (some would say ethical) aspects to the debate. Proponents of privatization seek to promote individual responsibility and reduce the role of government. Other analysts stress that traditional public pension systems are social insurance programs based on the notion of collective responsibility. Beyond the rhetoric, two facts stand out: First, traditional public programs are not set in stone and are periodically reformed to resolve legislated financing problems. Second, there is nevertheless a clear trend toward privatizing public systems. Approximately 30 nations have privatized at least a portion of their public systems, and privatization has been more common in countries with well-developed public systems that cover a large percentage of workers.

Privatization of pensions can take many forms, and it can coexist with strong public programs. One progressive idea, developed by the Switzerland-based Geneva Association, promotes the concept of Four Pillars of Support. In many countries, pension funding rests on two or three pillars: a public pension based on pay-as-you-go funding; a supplemental or mandatory occupational pension (common in some European nations) that often is fully funded; and individual savings, which may include personal investments and life insurance. The Geneva Association proposes a fourth pillar based on a new design for retirement that encourages continued economic activity (either full-time or part-time) by older people, and incorporates the concept of gradual retirement instead of early retirement.⁵⁹ Crossnational research on labor force participation at older ages has shown that levels of participation are a consequence (intended or unintended) of retirement provisions and/or tax policy.⁶⁰ The financial structure of national social security systems may reward early retirement, and attempts to encourage increased labor force participation at older ages may be largely

contingent upon politically difficult changes in these systems.

Successful Aging

Aging is not merely a matter of accumulating years but also, as a popular catch-phrase states, a process of “adding life to years, not years to life.” People grow old in a social and economic context that affects their psychosocial development: their feelings of self-esteem, value, and place in family and society. These factors have a combined effect on the morale of older people, and a number of models have been developed to explain why some people remain more active and healthier at older ages than other people. These are generalized models and cannot account for differences in the genetic makeup of individuals, although the models can identify factors that favor healthy lifestyles and ways in which a society can assist its members to grow old with dignity and comfort. Underpinning these concepts or models are several decades of study by gerontologists who have offered a number of social theories of aging (see Box 6).

The concept of *successful aging* has recently attracted a great deal of policy and research attention and is related to the broad issues of coping and adaptation in later life. Growing numbers of older people do not exhibit the chronic health problems and declining cognitive skills that were assumed to accompany aging. Successful aging is viewed as maximizing desired outcomes and minimizing undesired ones. As demonstrated in the Berlin Aging Study, adaptation is a key component to successful aging: Older adults can compensate for losses and declines and retain the potential for further growth. Aging experts John Rowe and Robert Kahn view successful aging as the confluence of three functions: decreasing the risk of diseases and disease-related disability; maintaining physical and mental functioning; and being actively engaged with life (see Figure 9, page 34).⁶¹ There is debate, however, about

Box 6

Social Theories of Aging

Theory building—the cumulative development of explanation and understanding of observations and findings—lies at the core of scientific inquiry and knowledge. In areas such as social gerontology, social theories are essential for providing coherent and valid bases for policies, programs, and activities. Social theories are not proved or disproved; rather, they represent a cumulative and evolutionary understanding as parts of the explanations are better understood, improved, or rejected.

Role theory is one of the oldest social gerontological theories, dating back to the 1940s.¹ Individuals play a variety of roles during their lives—child, adult, spouse, parent, employer, employee, grandparent, retiree. Roles are often sequential, some are concurrent, and individuals lose and gain roles throughout life. Chronological age often determines some changes (such as attaining voting age or retirement age), but age norms—assumptions that people should do or cease certain activities at certain ages—underpin much of role theory. Some role images and changes can be challenged legally (such as formal retirement ages) or by public perceptions (older people as athletes, astronauts, entertainers, and other positive images).

Activity theory (from the 1960s) suggests that older people who take on a large number and variety of activities and roles will have a more positive older age, adjust to aging better, and be more satisfied with their lives.² Activity theory tends to promote old age as a social problem or issue that individuals can tackle. A differing perspective to this was **disengagement theory**, which found a mutual withdrawal between the older person and society.³ Disengagement theory sees society withdrawing from the aging person as much as the older person withdrawing from society, and disengagement is viewed as adaptive behavior. Assumptions about disengagement of older people—which was seen by some as unavoidable and universal—have prompted much debate, research, and modification.

Continuity theory holds that middle-aged and older adults often attempt to preserve ties with their own past experiences by substituting new roles that are similar to lost ones.⁴ The theory suggests that people are most satisfied in their older years when their new roles and activities are consistent with previous experiences. This approach tends to

emphasize individual behavior and neglects the societal constraints that deter older people from continuing some activities, but it nevertheless looks positively at continuation of activities such as sports, religion, reading, or teaching.

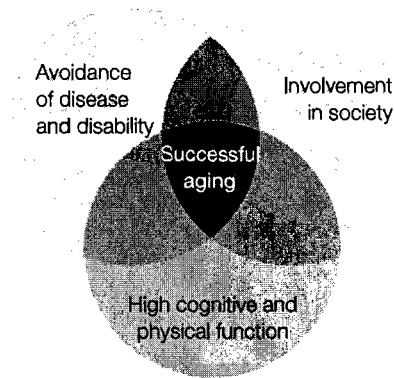
While these theories have been sometimes portrayed as challenging one another, they also represent an evolution of understanding of aging and the place of older people in society. A number of alternative and additional theories have focused on the interaction between an individual and the environment.⁵ The **subculture of aging theory** views older people as maintaining their self-concepts and identities through membership in social groups. Subcultures might form within political, religious, and professional groups, or from “membership” that accrues from living in, say, a retirement home or retirement community. Within such potentially closed communities, residents may act and behave in collective ways that perhaps they would not do if living in the wider community.

Other more general theories such as **modernization theory** discuss negative effects on the roles and status of older people if their knowledge, traits, and skills are deemed less relevant or valuable as modernization proceeds. **Exchange theory** helps explain why most older people, in spite of reduced resources, seek to maintain some degree of reciprocity while remaining independent and active. **Feminist gerontology** criticizes the male-centered views inherent in much theory on aging, even though older people are predominantly women.⁶

References

1. Leonard S. Cottrell, “The Adjustment of the Individual to His Age and Sex Roles,” *American Sociological Review* 7 (1942): 617-20.
2. Cary S. Kart and Jennifer M. Kinney, *The Realities of Aging: An Introduction to Gerontology* (Boston: Allyn and Bacon, 2001).
3. Elaine Cumming and William E. Henry, *Growing Old* (New York: Basic Books, 1961).
4. Robert C. Atchley, *The Social Forces in Later Life* (Belmont, CA: Wadsworth, 1972); and Robert C. Atchley, “A Continuity Theory of Normal Aging,” *The Gerontologist* 29, no. 2 (1989): 183-90.
5. Nancy R. Hooyman and H. Asuman Kiyak, *Social Gerontology: A Multidisciplinary Perspective*, 6th ed. (Boston: Allyn and Bacon, 2002).
6. Robert J. Lynott and Patricia Passuth Lynott, “Tracing the Course of Theoretical Development in the Sociology of Aging,” *The Gerontologist* 36, no. 6 (1996): 749-60.

Figure 9
Model of Successful Aging



Source: Adapted from J.W. Rowe and R.L. Kahn, *The Gerontologist* 37, no. 4 (1997): 433-40.

how those who age successfully differ from others and about the role of external factors in the process.⁶²

In addition to *successful aging*, concepts such as *productive aging* (the ability to contribute directly and indirectly in older age) and *healthy aging* (the ability to remain physically and mentally fit) have been identified. These concepts come together in the WHO's policy framework of *active aging* developed between the late 1990s and 2002.⁶³ The word "active" refers to continuing participation in social, economic, cultural, spiritual, and civic affairs, not just being physically or economically active. Active aging encompasses those who have retired as well as people who are frail, disabled, or in need of care; and it takes place within a broad social context of friends, family, neighbors, associates, and the workplace. Active aging recognizes the UN's principles of independence, participation, dignity, care and self-fulfillment. It shifts strategic planning away from a needs-based approach (which implies older people are passive recipients) to a rights-based approach of equality and opportunity. The WHO advocates a life-course approach to active aging that recognizes older people not as a homogeneous group but as individuals who, collectively, are as diverse as younger members of a soci-

ety. The strategy promotes supportive environments and fosters healthy life choices at all stages of life. Finally, it recognizes that a collective approach to aging and older people will ultimately determine how we and our children and grandchildren experience life in later years.

Longer-Term View

In most countries, but especially those in less developed regions, economic growth remains the priority; social considerations take a back seat. While economic development may ultimately increase the ability of countries to support older people, development and population aging interact in numerous ways.

The UN Economic and Social Commission for Asia and the Pacific elaborated these interactions in 1999 when it sponsored the first aging and development plan for a less developed region, the Macau Plan of Action on Ageing for Asia and the Pacific.⁶⁴ The plan explicitly notes that population aging tends to increase fiscal demands on governments, especially for income support, health, and social services. In addition, the urbanization that almost always accompanies development tends to reduce traditional support networks for older people at the same time that labor markets have decreasing demand for the skills and experience of older workers. The aging cohorts in many less developed countries are an interim generation: They are reaching retirement age before gaining sufficient personal savings and pensions and at the same time as their traditional family support may be withering.⁶⁵ In this sense, population aging can reduce the savings available for national investment. Some economists from more developed regions fear that the financial burden of pensions and long-term care for expanding retired populations may reduce the ability to invest overseas and buy industrial goods from less developed countries.

Demographic aging has become a global development issue. Economists, however, may be overly pessimistic. Family systems of care have proved very resilient worldwide and, with a modicum of formal help, may continue to support older relatives for decades. Shoring up family systems would entail reorienting investment toward training and long-term care assistance, but it could ultimately build more supportive societies.⁶⁶ Another factor that could ease the financial burden of aging is the incorporation of pension needs in the development strategies of international donor organizations. Less developed countries that provide even a minimal pension to a significant portion of their older population have demonstrated that pensions can ameliorate poverty.⁶⁷ The rising demand for imported labor in the richer, demographically stagnant countries is another potential source of support for older people in less developed countries. While such demand may induce a brain drain from less developed nations, it would also generate an increasing flow of remittances to older individuals. There are other development opportunities that aging populations can create, not the least of which is in parts of Asia called the "silver market," the demand for goods and services by older people themselves.

Aging and National Security

The profound shifts in age structure around the world have prompted a reexamination of strategic and economic thinking about national security. Countries that are growing slowly (or not at all) are experiencing declines in the size of their younger populations. While most of these nations have shifted from manpower-intensive to capital-intensive armed forces, some analysts are concerned about the future size and demographic profile of defense forces. Countries with high fertility rates, in contrast, have a surplus of youth. Large armies are a source of employment as well as

national strength, and countries at an earlier level of demographic transition are potentially destabilizing forces not only vis-à-vis immediate neighbors but to the world as a whole.⁶⁸

The more worrisome long-term security scenarios involve widening budget deficits in more developed countries. There is concern that higher spending on social programs will increase interest rates and crowd out private investment. Some analysts argue that, as populations stabilize or decline, the shrinking numbers of workers and consumers may reduce national GDP growth, asset values, savings rates, and currency values. Consequently, tax revenues and the values of mortgage-backed securities will decline in some countries, with ripple effects throughout the world. The OECD, the International Monetary Fund (IMF), the European Commission, and other groups have studied the influence of aging on the economy. While the studies have different approaches and emphases, the shared conclusion is that economic growth will slow as populations age.⁶⁹

Global Capital Flows

Whether population decline and slower economic growth are twin evils for social well-being is debatable and beyond the scope of this report. The "doom and gloom" scenarios of aging painted by some analysts are countered by optimistic assessments from other analysts. A sustained rise in productivity, for example, could offset many of the fiscal negatives mentioned above. If, as some claim, economists know very little about how technological change occurs, then the effects of aging populations on technological innovation are unknown.⁷⁰ Considering the broader picture, analysts have begun to examine the implications of population aging for global capital flows. By the late 1990s, the aging Japanese society had become the world's largest exporter of capital.⁷¹ Simulations suggest that there will be substantial capital flows from rapidly aging countries such as

Italy and Germany to the rest of the world in the near future, although the long-term impact of such flows remains unclear.⁷²

Looking further down the road, IMF simulations foresee a turning point between 2010 and 2030, when Europe and North America become capital importers of flows from today's less developed regions.⁷³ If retired baby boomers in wealthier countries decide to sell off their stocks and other assets as they age, standard economic theory predicts that the price of such assets will fall. Some observers, however, believe that "younger" countries will step in and absorb any sell-off. Countries in less-advanced stages of the demographic transition have large segments of their populations in the prime working ages, with the potential for high levels of economic output and savings. Depending on the economic climate, this "demographic dividend" has the potential to fuel growth and capital accumulation, as it did in parts of Asia during prior decades.⁷⁴

Will Living Standards Improve?

Given the maturation of public pensions systems, increased female labor force participation, and the expanded private pension schemes in industrialized nations, older citizens in these countries would be expected to be better off economically than previous generations of older people. Indeed, the OECD has concluded that the economic picture for older people has been stable or improved in recent decades, both in absolute terms and relative to younger population groups. Poverty rates for older people have declined in most nations, as has the share of older people among the poor.

In the United States, real median household income (adjusted for household size) improved much more for older people than for the general population. And poverty among people age 65 or older has declined. One-third of all older U.S.

citizens were below the poverty line in 1960; by the mid-1990s, just 10 percent were below poverty, lower than the rate for children.⁷⁵

There is a growing perception in some countries that the older population is faring better than other age groups. However, the complexity of measuring economic well-being often precludes a definitive assessment, and there is considerable concern about the willingness and ability of households to adequately save for retirement needs.⁷⁶ The ongoing Luxembourg Income Study reveals substantial variation among countries in poverty rates at older ages. One comparison of nine countries found that Canada, Germany, and Hungary provided their older residents with better overall protection from poverty than the other six countries. These overall figures may mask large disadvantages for specific groups within countries—in particular, for older women living alone.⁷⁷

Age Waves

In spite of inevitable changes in political regimes and economic uncertainty, forecasters must sometimes peer far into the future. The U.S. Social Security Administration makes population projections 75 years ahead; the International Institute for Applied Systems Analysis looks to the year 2100; and the UN Population Division now produces population projections for the next 300 years. While such long-range scenarios are likely to be confounded by unforeseen events, they do provide broad planning targets. Some demographers have used long-term projections to identify patterns of population aging and raise warning flags about potential consequences. Demographer Ian Pool, for example, argues that aging is not a monotonic transitional process, but rather the outcome of complex age structural mutations that vary by country. By plotting the changing size of different age groups between 1950 and 2050, Pool paints a picture of double or multiple population waves

that result not just from declining fertility rates, but from the timing of low fertility (for example, during the Great Depression, the World Wars, and the baby bust following the baby boom), from resurgences in fertility during baby booms and baby-boom echoes, and from the effects of trends in migration and survival.⁷⁸

The inexorable momentum of population aging around the world will likely become the most significant demographic process of the 21st century. Continuing shifts in population age structure will require new social sensitivities and innovative policy

responses. Demographic aging has implications for a wide range of human behavior, and researchers increasingly recognize the need for multidisciplinary approaches to the aging process. Initiatives in North America, Europe, and Asia that integrate several salient domains of people's lives have created successful prototypes for such interdisciplinary studies. The next steps in understanding the aging phenomenon will come from a further integration of scientific inquiry, combining ideas from biodemography, genomics, psychology, and macroeconomics.

References

1. Following United Nations usage, the terms "more developed," "developed," or "industrialized" include all European and North American countries, along with Australia, New Zealand, and Japan. The terms "less developed," "developing," or "nonindustrialized" refer to all other countries. While these broad categories commonly are used for comparative purposes, they do not necessarily reflect developmental differences between nations.
2. United Nations (UN), *World Population Ageing 1950-2050* (New York: UN, 2002).
3. Throughout this *Population Bulletin*, estimates and projections of population size and composition (unless otherwise noted) come from the International Programs Center, Population Division, U.S. Census Bureau.
4. Zhou Yang, Edward C. Norton, and Sally C. Stearns, "Longevity and Health Care Expenditures: The Real Reasons Older People Spend More," *Journal of Gerontology: Social Sciences* 58B, no. 1 (2003): S2-10.
5. James W. Vaupel and Bernard Jeune, "The Emergence and Proliferation of Centenarians," in *Exceptional Longevity: From Prehistory to the Present*, ed. B. Jeune and J.W. Vaupel (Odense, Denmark: Odense University Press, 1995).
6. Hans-Peter Kohler, Francesco C. Billari, and Jose Antonio Ortega, "The Emergence of Lowest-Low Fertility in Europe During the 1990s," *Population and Development Review* 28, no. 4 (2002): 641-80.
7. Ronald D. Lee, "The Formal Demography of Population Aging, Transfers, and the Economic Life Cycle," in *Demography of Aging*, ed. Linda G. Martin and Samuel H. Preston (Washington, DC: National Academies Press, 1994): 8-49.
8. Arjan Gjonka, Hilke Brockmann, and Heiner Maier, "Old-Age Mortality in Germany Prior to and After Reunification," *Demographic Research* 3, Article 1 (July 2000), accessed online at www.demographic-research.org/volumes/vol3/1/html/default.htm, on Dec. 27, 2004.
9. James W. Vaupel, "Demographic Analysis of Aging and Longevity," *American Economic Review* 88, no. 2 (1998): 242-47.
10. Vaino Kannisto, *Development of Oldest-Old Mortality, 1950-1990: Evidence From 28 Developed Countries* (Odense, Denmark: Odense University Press, 1994).
11. John R. Wilmoth et al., "Increase in Maximum Life-Span in Sweden, 1861-1999," *Science* 289 (Sept. 29, 2000): 2366-68; and Scott M. Lynch and J. Scott Brown, "Reconsidering Mortality Compression and Deceleration: An Alternative Model of Mortality Rates," *Demography* 38, no. 1 (2001): 79-95.
12. For a discussion and examination of these hypotheses, see Shiro Horiuchi and John R. Wilmoth, "Deceleration in the Age Pattern of Mortality at Older Ages," *Demography* 35, no. 4 (1998): 391-412.
13. S. Jay Olshansky, "On the Biodemography of Aging: A Review Essay," *Population and Development Review* 24, no. 2 (1998): 381-93; and Caleb E. Finch, James W. Vaupel, and Kevin Kinsella, eds., *Cells and Surveys: Should Biological Measures Be Included in Social Science Research?* (Washington, DC: National Academies Press, 2001).
14. Thomas J. Moore, *Lifespan* (New York: Simon and Schuster, 1993); and James C. Riley, *Rising Life Expectancy: A Global History* (Cambridge, England: Cambridge University Press, 2001).
15. Peter G. Peterson, *Gray Dawn: How the Coming Age Wave Will Transform America—and the World* (New York: Crown Publishing Group, 2000).
16. A study of crosscountry and Russian household survey data found that alcohol consumption and stress (associated with a poor outlook for the future) were the most important determinants of life expectancy decline in Russia. See Elizabeth Brainerd and David M. Cutler, "Autopsy on an Empire: Understanding Mortality in Russia and the

- Former Soviet Union," *National Bureau of Economic Research Working Paper* 10868 (October 2004), accessed online at www.nber.org/papers/w10868, on Dec. 27, 2004.
17. Árpád Skrabski, Maria Kopp, and Ichiro Kawachi, "Social Capital in a Changing Society: Cross-Sectional Associations With Middle-Aged Female and Male Mortality Rates," *Journal of Epidemiology and Community Health* 57, no. 2 (2003): 114-19.
 18. National Center for Health Statistics, *Health, United States, 2002*, accessed online at ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Publications/Health_US/hus02/, on March 8, 2003.
 19. Ronald Skeldon, "Ageing of Rural Populations in South-East and East Asia," in *The World Ageing Situation: Exploring a Society for All Ages*, ed. United Nations (UN) (New York: UN, 2001): 38-54.
 20. Antonio Golini, "Possible Policy Responses to Population Ageing and Population Decline," in UN Population Division, *United Nations Expert Group Meeting on Policy Responses to Population Ageing and Population Decline*, ESA/P/WP.163 (New York: UN, 2000): 7/1-16.
 21. Kevin McCracken and David R. Phillips, "International Demographic Transitions," in *Ageing and Place*, ed. Gavin J. Andrews and David R. Phillips (London and New York: Routledge, 2005): 36-60; Hong Kong, *SARS in Hong Kong: From Experience to Action: Report of the SARS Expert Committee* (Hong Kong: Government of the Hong Kong Special Administrative Region, 2003); and Hong Kong Hospital Authority, unpublished data, June 2003.
 22. Eric Barbotte et al., "Prevalence of Impairments, Disabilities, Handicaps and Quality of Life in the General Population: A Review of Recent Literature," *Bulletin of the World Health Organization* 79, no. 11 (2001): 1047-55.
 23. Gerda G. Fillenbaum, "Activities of Daily Living," in *The Encyclopedia of Aging*, ed. George L. Maddox (New York: Springer, 1995): 7-9.
 24. Paul B. Baltes and Karl Ulrich Mayer, eds., *The Berlin Aging Study: Aging From 70-100* (Cambridge, England: Cambridge University Press, 1999).
 25. Michael G. Marmot and James Y. Nazroo, "Social Inequalities in Health in an Ageing Population," *European Review* 9, no. 4 (2001): 445-60.
 26. Jean-Marie Robine et al., *Determining Health Expectancies* (New York: Wiley, 2002). See also www.revesnetwork.net for additional information.
 27. Vicki A. Freedman, Linda G. Martin, and Robert F. Schoeni, "Recent Trends in Disability and Functioning Among Older Adults in the United States," *Journal of the American Medical Association* 288, no. 24 (2002): 3137-46.
 28. James F. Fries, "The Compression of Morbidity: Near or Far?" *Milbank Quarterly* 67, no. 2 (1989): 208-32.
 29. Kenneth G. Manton and XiLaing Gu, "Changes in the Prevalence of Chronic Disability in the United States Black and Nonblack Population Above Age 65 From 1982 to 1999," *Proceedings of the National Academy of Sciences* 98, no. 11 (2001): 6354-59.
 30. Joshua A. Salomon and Christopher J. Murray, "The Epidemiologic Transition Revisited: Compositional Models for Causes of Death by Age and Sex," *Population and Development Review* 28, no. 2 (2002): 205-28.
 31. Organisation for Economic Co-Operation and Development (OECD), *Study on Cross-National Differences of Ageing-Related Diseases*, June 2002 workshop, accessed online at www.oecd.org, on Jan. 26, 2005; and Stephane Jacobzone and Howard Oxley, "Ageing and Health Care Costs," *International Politics and Society* 2002, no. 1, accessed online at www.fes.de/ipg/ONLINE2_2002/INDEXE.HTM, on March 6, 2003.
 32. Albert I. Hermalin, "Capturing Change: Transitions at Older Ages and Cohort Succession," in *The Well-Being of the Elderly in Asia: A Four-Country Comparative Study*, ed. Albert I. Hermalin (Ann Arbor, MI: University of Michigan Press, 2002): 519-41.
 33. Charlotte A. Schoenborn, "Marital Status and Health: United States, 1999-2002," *Advance Data From Vital and Health Statistics* 351 (Dec. 15, 2004).
 34. Maria Cattell, "African Widows, Culture and Social Change: Case Studies from Kenya," in *The Cultural Context of Aging*, 2d ed., ed. Jay Sokolovsky (Westport, CT: Greenwood, 1997): 71-98.
 35. Thomas L. Hungerford, "The Economic Consequences of Widowhood on Elderly Women in the United States and Germany," *The Gerontologist* 41, no. 1 (2001): 103-10.
 36. Jenny de Jong Gierveld, "Gender and Well-Being: The Elderly in the Industrialized World," paper prepared for the International Union for the Scientific Study of Population Seminar on Population Ageing in the Industrialized Countries: Challenges and Responses, Tokyo, March 19-21, 2001.
 37. Lilian E. Pezzin and Barbara Steinberg Schone, "Parental Marital Disruption and Intergenerational Transfers: An Analysis of Lone Elderly Parents and Their Children," *Demography* 36, no. 3 (1999): 287-97.
 38. UN Educational, Scientific and Cultural Organization (UNESCO), "Education Statistics," accessed online at <http://portal.unesco.org/uis>, on Feb. 22, 2003.
 39. HelpAge International, *State of the World's Older People 2002* (London: HelpAge International, 2002).
 40. Anita C.Y. Ng, David R. Phillips, and William K.M. Lee, "Persistence and Challenges to Filial Piety and Informal Support of Older Persons in a Modern Chinese Society: A Case Study in Tuen Mun, Hong Kong," *Journal of Aging Studies* 16, no. 1 (2002): 1-20.

41. Cary S. Kart and Jennifer M. Kinney, *The Realities of Aging: An Introduction to Gerontology*, 6th ed. (Boston: Allyn and Bacon, 2001).
42. Vern L. Bengtson et al., "Families and Intergenerational Relationships in Aging Societies," *Hallym International Journal of Aging* 2, no. 1 (2000): 3-10.
43. Zachary Zimmer and Julia Kwong, "Family Size and Support of Older Adults in Urban and Rural China: Current Effects and Future Implications," *Demography* 40, no. 1 (2003): 23-44.
44. Nancy R. Hooyman and H. Asuman Kiyak, *Social Gerontology: A Multidisciplinary Perspective*, 6th ed. (Boston: Allyn and Bacon, 2002).
45. Statistical Office of the European Communities (EUROSTAT), *Population, Households, and Dwellings in Europe, Main Results of the 1990/1991 Censuses* (Luxembourg: EUROSTAT, 1996).
46. Baltes and Mayer, "The Berlin Aging Study."
47. John Knodel and Nibhon Debavalaya, "Living Arrangements and Support Among the Elderly in South-East Asia: An Introduction," *Asia-Pacific Population Journal* 12, no. 4 (1997): 5-16.
48. Chuks J. Mba, "Determinants of Living Arrangements of Lesotho's Elderly Female Population," *Journal of International Women's Studies* 3, no. 2 (2002), accessed online at www.bridgew.edu/SoAS/jiws/June02/aginglesotho.pdf, on Jan. 29, 2005.
49. David R. Phillips, ed., *Ageing in the Asia-Pacific Region* (London: Routledge, 2000).
50. Estimates may vary according to national definitions of institutions. See Mary Jo Gibson, Steven R. Gregory, and Sheel M. Pandya, "Long-Term Care in Developed Nations: A Brief Overview," *AARP Public Policy Institute*, October 2003, accessed online at http://research.aarp.org/health/2003_13_ltc_dv.html, on Jan. 28, 2005.
51. Robert L. Clark, Elizabeth Anne York, and Richard Anker, "Retirement and Economic Development: An International Analysis," in *Social Policy and the Labour Market*, ed. Philip R. De Jong and Theodore R. Marmor (Brookfield, VT: Ashgate, 1997): 117-46.
52. Kevin Kinsella and Victoria A. Velkoff, *An Aging World: 2001* (Washington, DC: Government Printing Office, 2001).
53. Organisation for Economic Co-Operation and Development (OECD), *Reforms for an Ageing Society* (Paris: OECD, 2000).
54. OECD, *Employment Outlook 2000* (Paris: OECD, 2000).
55. Robert Holzmann and Joseph E. Stiglitz, eds., *New Ideas About Old Age Security: Towards Sustainable Pension Systems in the 21 Century* (Washington, DC: The World Bank, 2001).
56. HelpAge International, *Age and Security* (London: HelpAge International, 2004).
57. Barry Bosworth and Gary Burtless, eds., *Ageing Societies: The Global Dimension* (Washington, DC: Brookings Institution Press, 1998).
58. Robert Palacios and Montserrat Pallares-Miralles, "International Patterns of Pension Provision," *Social Protection Discussion Paper*, no. 9 (Washington, DC: The World Bank, 2000).
59. The Geneva Association, "The Four Pillars Research Programme 1987-2002" (June 2002), accessed online at www.genevaassociation.org, on Dec. 12, 2004.
60. Jonathan Gruber and David Wise, eds., *Social Security and Retirement Around the World* (Chicago: University of Chicago Press, 1999).
61. John W. Rowe and Robert L. Kahn, *Successful Aging: The MacArthur Foundation Study* (New York: Pantheon, 1998).
62. Douglas D. Friedrich, *Successful Aging* (Springfield, IL: Charles C. Thomas, 2001).
63. WHO, *Active Ageing: A Policy Framework* (2002), accessed online at www.who.int/hpr/ageing/ActiveAgeingPolicyFrame.pdf, on Jan. 26, 2005.
64. United Nations, *The Macau Plan of Action on Ageing for Asia and the Pacific*, accessed online at www.unescap.org/ageing/macau.htm, on Nov. 12, 2004.
65. Phillips, *Ageing in the Asia-Pacific Region*.
66. David R. Phillips and Alfred C.M. Chan, eds., *Ageing and Long-Term Care* (Singapore: Institute of Southeast Asian Studies; and Ottawa: International Development Research Centre, 2002).
67. HelpAge International, *State of the World's Older People 2002* (London: HelpAge International, 2002).
68. Brian Nichiporuk, *The Security of Demographic Factors* (Santa Monica, CA: RAND, 2000).
69. Robert Stowe England, *The Macroeconomic Impact of Global Aging: A New Era of Economic Frailty?* (Washington, DC: CSIS Press, 2002); and Pension Research Council (PRC) of the Wharton School, University of Pennsylvania, "Risk Management for Global Aging: Perspectives on the Challenges Facing Industrialized Countries," *PRC Working Paper 2003-1* (2003).
70. Alan Greenspan, Statement to the U.S. Senate Special Committee on Aging, in *Global Aging: Opportunity or Threat for the U.S. Economy?* Serial No. 108-4, Feb. 27, 2003 (Washington, DC: U.S. Government Printing Office, 2003).
71. Center for Strategic and International Studies (CSIS) and Watson Wyatt Worldwide, *Global Aging: The Challenge of the New Millennium* (Washington, DC: CSIS and Watson Wyatt Worldwide, 2000).

72. Axel Boersch-Supan, Alexander Ludwig, and Joachim Winter, "Aging and International Capital Flows," in *Aging, Financial Markets and Monetary Policy*, ed. Alan Auerbach and Heinz Hermann (Heidelberg, Germany: Springer, 2002): 55-83. See also Axel Boersch-Supan, "Global Aging: Issues, Answers, More Questions," *University of Michigan Retirement Research Center Working Paper* WP-2004-084 (June 2004).
73. Robin Brooks, "Population Aging and Global Capital Flows in a Parallel Universe," *IMF Staff Papers* 50, no. 2 (2003).
74. David E. Bloom, David Canning, and Jaypee Sevilla, *The Demographic Dividend: A New Perspective on the Economic Consequences of Population Change* (Santa Monica, CA: RAND, 2003).
75. Robert B. Friedland and Laura Summer, *Demography Is Not Destiny* (Washington, DC: National Academy on an Aging Society, 1999).
76. F. Landis MacKellar, "The Predicament of Population Aging: A Review Essay," *Population and Development Review* 26, no. 2 (2000): 365-97.
77. Peter Saunders and Timothy M. Smeeding, "How Do the Elderly in Taiwan Fare Cross-Nationally? Evidence from the Luxembourg Income Study Project," *SPRC Discussion Paper* 81 (University of New South Wales Social Policy Research Centre, April 1998), accessed online at www.sprc.unsw.edu.au/dp/dp081.pdf, on Dec. 27, 2004.
78. Ian Pool, "Age-Structure in Industrialized Countries," in *Ageing and Age-Structural Transitions in Industrialized Countries*, ed. Naohiro Ogawa et al. (Oxford, England: Clarendon Press, forthcoming).

Suggested Resources

- Baltes, Paul B., and Karl Ulrich Mayer. *The Berlin Aging Study: Aging From 70 to 100*. Cambridge, England: Cambridge University Press, 1999.
- HelpAge International. *State of the World's Older People 2002*. London: HelpAge International, 2002.
- Hermalin, Albert I., ed. *The Well-Being of the Elderly in Asia: A Four-Country Comparative Study*. Ann Arbor, MI: University of Michigan Press, 2002.
- Hooyman, Nancy, and H. Asuman Kiyak. *Social Gerontology: A Multidisciplinary Perspective*, 6th ed. Boston: Allyn and Bacon, 2002.
- Lloyd-Sherlock, Peter, ed. *Living Longer*. London: Zed Books, 2004.
- National Research Council. *Preparing for an Aging World: The Case for Cross-National Research*. Washington, DC: National Academies Press, 2001.
- Olshanksy, Stuart Jay, and Bruce A. Carnes. *The Quest for Immortality: Science at the Frontiers of Aging*. New York: W.W. Norton, 2001.
- United Nations Population Division. *World Population Ageing 1950-2050*. New York: United Nations, 2002.

Websites

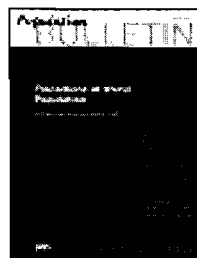
- Asia-Pacific Institute of Ageing Studies, Lingnan University, Hong Kong**
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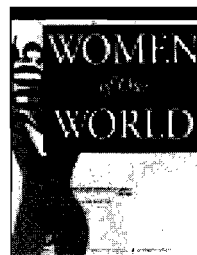
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