

# An Aging World: 2008

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# 20 Questions About Global Aging

See what you know about worldwide population aging in the early twenty-first century.

Answers appear on next page.

1. True or false? The world's children under age 5 outnumber people aged 65 and over.
2. The world's older population (65 and over) is increasing by approximately how many people each month in 2008?
  - a. 75,000
  - b. 350,000
  - c. 600,000
  - d. 870,000
3. Which of the world's developing regions has the highest percentage of older people?
  - a. Africa
  - b. Latin America
  - c. The Caribbean
  - d. Asia
4. China has the world's largest total population (more than 1.3 billion). Which country has the world's largest older population?
  - a. China
  - b. Germany
  - c. Russia
  - d. India
5. True or false? More than half of the world's older people live in the industrialized nations of Europe, North America, Japan, and Australia.
6. Which country has the world's highest percentage of older people in 2008?
  - a. Sweden
  - b. Japan
  - c. Spain
  - d. Italy
7. True or false? Current demographic projections suggest that 35 percent of all people in the United States will be at least 65 years of age by the year 2050.
8. True or false? The number of the world's "oldest old" (people 80 and over) is growing more rapidly than the older (65 and over) population as a whole.
9. Japan has the highest life expectancy among the major countries of the world. How many years can a Japanese baby born in 2008 expect to live, on average?
  - a. 70 years
  - b. 75 years
  - c. 82 years
  - d. 90 years
10. True or false? Today, average life expectancy at birth is less than 45 years in some countries.
11. What are the leading killers of older people in Europe and North America?
  - a. Cancers
  - b. Circulatory diseases
  - c. Respiratory diseases
  - d. Accidents
12. True or false? The percentage of older people in rural areas is generally lower than in large cities.
13. There are more older widows than widowers in virtually all countries because:
  - a. Women live longer than men.
  - b. Women typically marry men older than themselves.
  - c. Men are more likely to remarry after divorce or the death of a spouse.
  - d. All of the above.
14. True or false? Sex ratios at older ages (i.e., the number of older men per 100 older women) usually are 90 or greater.
15. In developed countries, recent increases in labor force participation rates of older workers are due to changing work patterns of:
  - a. Men
  - b. Women
  - c. Men and women
16. What proportion of the world's countries have a public old-age security program?
  - a. All
  - b. Three-fourths
  - c. One-half
  - d. One-fourth
17. True or false? In most countries, international migration has little effect on the overall population age structure.
18. In which country are older people least likely to live alone?
  - a. The Philippines
  - b. Hungary
  - c. Canada
  - d. Denmark
19. True or false? In developing countries, older men are more likely than older women to be illiterate.
20. True or false? In any country, it is almost impossible to have population aging and a decline in total population size at the same time.

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# Answers

1. **True.** Although the world's population is aging, children still outnumber older people as of 2008. Projections indicate, however, that in fewer than 10 years, older people will outnumber children for the first time in history.
2. **d.** The estimated change in the total size of the world's older population between July 2007 and July 2008 was more than 10.4 million people, an average of 870,000 each month.
3. **c.** The Caribbean, with 7.8 percent of all people aged 65 and over in 2008. Corresponding figures for other regions are Latin America, 6.4 percent; Asia (excluding Japan), 6.2 percent; and Africa, 3.3 percent.
4. **a.** China also has the largest older population, numbering 106 million in 2008.
5. **False.** Although industrialized nations have higher percentages of older people than do most developing countries, 62 percent of all people aged 65 and over now live in the developing countries of Africa, Asia, Latin America, the Caribbean, and Oceania.
6. **b.** Japan, with 22 percent of its population aged 65 or over, has recently supplanted Italy as the world's oldest major country.
7. **False.** Although the United States will age rapidly when the Baby Boomers (people born between 1946 and 1964) begin to reach age 65 after the year 2010, the percentage of the population aged 65 and over in the year 2050 is projected to be 20 percent (compared with 12 percent today).
8. **True.** The oldest old are the fastest-growing component of many national populations. The world's growth rate for the 80-and-over population from 2007 to 2008 was 4.3 percent, while that of the world's older (65 and over) population as a whole was 2.1 percent (compared with 1.2 percent for the total [all ages] population).
9. **c.** 82 years, up from about 52 in 1947.
10. **True.** In some African countries (e.g., Malawi, South Africa, Zambia, and Zimbabwe) where the HIV/AIDS epidemic is particularly devastating, average life expectancy at birth is less than 45 years.
11. **b.** Circulatory diseases (especially heart disease and stroke) typically are the leading cause of death as reported by the World Health Organization. In the United States in 2004, heart disease was the leading cause of death in the 65-and-over age group, accounting for 30 percent of all deaths. This percentage, however, has declined in recent decades (it was 44 percent in the United States in 1980).
12. **False.** Rural-to-urban migration tends to lower the percentage of younger adults in rural areas and correspondingly raise the percentage of older residents.
13. **d.** All of the above.
14. **False.** Sex ratios at older ages are 90 or above in about 20 percent of the world's countries/areas. Sex ratios at older ages are 80 or below in a majority of countries/areas and 50 or below in parts of the former Soviet Union.
15. **c.** From the late 1960s until the 1990s, labor force participation rates of older men in most developed countries were declining, whereas those for women were often increasing. More recently, activity rates for men also have begun to increase.
16. **b.** As of 2004, 167 countries/areas of the world (74 percent) reported having some form of an old age/disability/survivors program. In many cases, program coverage is limited to certain occupational subgroups.
17. **True.** International migration does not play a major role in the aging process of most countries, but it can be important in small populations that have experienced a combination of emigration of working-aged adults, immigration of older retirees from other countries, and/or return migration of former emigrants.
18. **a.** The Philippines. The percentage of older people living alone in developing countries is usually much lower than that in developed countries; levels in the latter may exceed 40 percent.
19. **False.** Older women are less likely to be literate. For example, data from China's 2000 census revealed that 26 percent of older women could read and write, compared with 66 percent of older men.
20. **False.** Total population size in at least 11 countries is projected to decline from today's levels by at least 1 million people by 2050; in some countries (e.g., Japan, Russia, and the Ukraine) the decline has already begun. All of these nations are aging, and the combination of population aging and population decline is historically unprecedented.

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# Introduction

The world's population is now aging at an unprecedented rate. Fertility decline together with urbanization were the dominant global demographic trends during the second half of the twentieth century, much as rapid improvements in life expectancy characterized the early 1900s. As we move through the first decade of the twenty-first century, population aging has emerged as a major demographic worldwide trend. Declining fertility and improved health and longevity have generated rising numbers and proportions of the older population in most of the world. As education and income levels rise, increasing numbers of individuals reach older age with markedly different longevity and personal expectations than their forebears.

Population aging represents, in one sense, a human success story of increased longevity. However, the steady, sustained growth of older populations also poses many challenges to policymakers.<sup>1</sup> In a few years' time, just after 2010, the numbers and proportions of older people (especially the oldest old) will begin to rise rapidly in most developed and many developing countries. The increase is primarily the result of high fertility levels after World War II and secondarily,

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<sup>1</sup> This report generally uses the following terms for component age groups: the "older population" to refer to people aged 65 and over and the "oldest old" to refer to people 80 and over. In some contexts (e.g., older people in the labor force), it is useful or necessary (due to data restrictions) to use other age groupings.

but increasingly, the result of reduced death rates at older ages.

Population aging and its global implications have received considerable attention in industrialized countries, and awareness is growing in the rest of the world. In 2002, the United Nations convened its second World Assembly on Aging (the first was in 1982) to consider the ramifications of global population aging. In 2007, the U.S. National Institute on Aging and the U.S. Department of State jointly issued a report entitled *Why Population Aging Matters*. Using data from the U.S. Census Bureau, the United Nations, the Statistical Office of the European Communities, as well as from regional surveys and scientific journals, the report identified nine trends that offer a snapshot of challenges:

- *The world's population is aging.* People aged 65 and over will soon outnumber children under age 5 for the first time in history.
- *Life expectancy is increasing.* Most countries show a steady increase in longevity over time, which raises questions about the potential for the human lifespan.
- *The number of the oldest old is rising.* The world's population aged 80 and over is projected to increase 233 percent between 2008 and 2040, compared with 160 percent for the population aged 65 and over and 33 percent for the total population of all ages.

- *Some populations are aging while their size declines.* While the world's population is aging, total population size is simultaneously declining in some countries, and the list of these countries is projected to expand.
- *Noncommunicable diseases are becoming a growing burden.* Chronic noncommunicable diseases are now the major cause of death among older people in both developed and developing countries.
- *Family structures are changing.* As people live longer and have fewer children, family structures are transformed and care options in older age may change.
- *Patterns of work and retirement are shifting.* Shrinking ratios of workers to pensioners and people spending a larger portion of their lives in retirement increasingly tax existing health and pension systems.
- *Social insurance systems are evolving.* As social insurance expenditures escalate, an increasing number of countries are evaluating the sustainability of these systems and revamping old-age security provisions.
- *New economic challenges are emerging.* Population aging has and will have large effects on social entitlement programs, labor supply, and total savings around the globe.

Each of the nine trends is examined further in this report. Rigorous scientific research on global aging issues based on comparable harmonized data will help nations better address the challenges and opportunities of an aging world (Burkhauser and Lillard, 2005).

The growth of older populations has commonly been associated with the developed, industrialized countries of Europe and North America. Most developed nations are among the demographically oldest in the world today, and some may have more grandparents than young children before the middle of the twenty-first century. In the early 1990s, developed nations as a whole had about as many children under 15 years of age as people aged 55 and over (approximately 22 percent of the total population in each category). The developing world, by contrast, still had a high proportion of children (35 percent of all people were under age 15) and a relatively low proportion (10 percent) of people aged 55 and over. However, the numbers of older people in developing nations often are large and everywhere are increasing. Well over half of the world's people aged 65 and over now live in developing nations (62 percent, or 313 million people, in 2008). By 2040, this share is projected to exceed three-quarters, with the absolute number of older people in developing countries topping 1 billion. Many developing countries have had or are now experiencing a notable downturn in their rate of natural population increase (births minus deaths), similar to what previously occurred in most industrialized nations. As this process accelerates, age structures will change. Eventually, older people become an ever-larger proportion of each nation's total population.

Box 1-1.

### Geographic Terms in This Report

The “developed” and “developing” country categories used in this report correspond directly to the “more developed” and “less developed” classification employed by the United Nations. Developed countries comprise all nations in Europe (including some nations that formerly were part of the Soviet Union) and North America, plus Japan, Australia, and New Zealand. The remaining nations of the world are classified as developing countries.

Data for world regions (e.g., Latin America and the Caribbean) generally are aggregated from individual country files of the International Data Base (IDB) of the Population Division of the Census Bureau. See Appendix A for a list of countries in each region.

Data for China include the Special Administrative Regions of Hong Kong and Macau. Data for China do not include Taiwan.

One purpose of this report, then, is to look at past, current, and projected numbers, proportions, and growth rates of older populations. Older populations also have increased because of worldwide improvements in health services, educational status, and economic development. The characteristics of older people are likely to be increasingly heterogeneous within nations. A second purpose of *An Aging World: 2008* is to summarize socioeconomic statistics for both developed and developing nations. Comparable data are included for as many as 52 nations when the categories are reasonably consistent. In 2008, these 52 nations (Appendix Table B-1) contained 77 percent of the world's total population and are referred to as “study countries” at various points in the text.

This report focuses primarily on people 65 years old and older. As is true of younger age groups, people aged 65 and over have very different economic resources, health statuses, living arrangements, and levels of integration into social life. *An Aging World: 2008* acknowledges this diversity

by disaggregating statistics into narrower age groups where possible. Such examination may reveal important demographic, social, and economic differences that have direct bearing on social policy now and in the future. For example, the fastest-growing portion of the older population in many nations is the oldest old, those aged 80 and over. Rapidly expanding numbers of very old people represent a social phenomenon without historical precedent—one that is bound to alter previously held stereotypes. The growth of the oldest old is salient to public policy because individual needs and social responsibilities change considerably with increased age.

*An Aging World: 2008* is the ninth crossnational report in a Census Bureau series on the world's older populations. The first two reports, *An Aging World* (1987) and *Aging in the Third World* (1988), used data primarily from the 1970 and 1980 rounds of worldwide censuses (those taken from 1965 to 1974 and 1975 to 1984, respectively), as well as demographic projections produced by the United Nations

Box 1-2.

### Projected Data in This Report

Throughout this report, projections of population size and composition come from the Population Division of the Census Bureau, unless otherwise indicated. As discussed further in Appendix C, these projections are based on analyses of individual national population age and sex structures; components of population change (rates of fertility, mortality, and net migration); and assumptions about the future trajectories of fertility, mortality, and migration for each country.

The population projections in this report were current as of January 2008. Projections for the United States and other countries are updated periodically as new data become available. Therefore, the data in this report are not the latest available for every country and, by extension, for groups of countries aggregated into regions. The impact of projection updates on indicators of population aging generally is modest and does not affect the overall trends described in this report.

Interested users may find the latest population figures for the United States (released in August 2008) at <[www.census.gov/population/www/projections/index.html](http://www.census.gov/population/www/projections/index.html)>. The latest population projections for all other countries of the world are available at <[www.census.gov/ipc/www/idb/](http://www.census.gov/ipc/www/idb/)>.

Population Division from its 1984 assessment of global population. Subsequent reports—*Population and Health Transitions* (1992); *Aging in Eastern Europe and the Former Soviet Union* (1993); *An Aging World II* (1993); *Older Workers, Retirement and Pensions* (1995); *An Aging World: 2001*; *Population Aging in Sub-Saharan Africa: Demographic Dimensions 2006*—and the current report include historical data from the earlier reports, available data from the 1990 and 2000 rounds of censuses, information from national sample surveys and administrative records, historical and projected data from the United Nations, and data from component population projections prepared by the International Programs Center (IPC) of the Population Division of the Census Bureau. Differences among reports in projected data reflect either a change in the source of the projections or revised demographic

insights and assumptions based on the most recent information.

Many of the data included in this report are from the Census Bureau's International Data Base (IDB). The IDB is maintained and updated by the IPC and is funded in part by the Behavioral and Social Research Program of the U.S. National Institute on Aging. IDB contents are readily available from the Census Bureau's Web site; the direct access address is <[www.census.gov/ipc/www/idb/](http://www.census.gov/ipc/www/idb/)>.

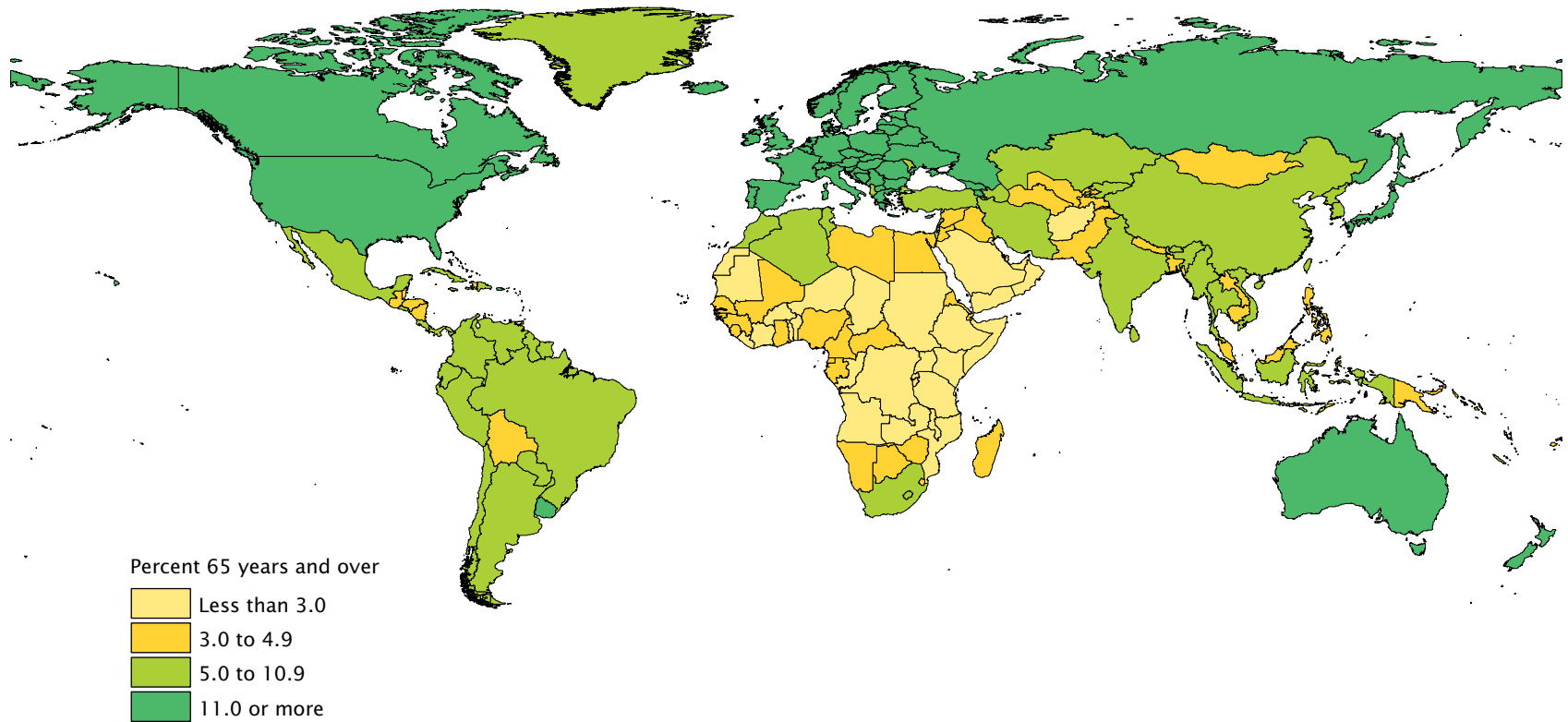
Appendix C provides more information about the sources, limitations, and availability of IDB files and report data in general. There are vast differences in both the quantity and quality of statistics reported by various countries. The United Nations and other organizations have provided international recommendations for the standardization of concepts and definitions of data collected in censuses

and surveys. Nevertheless, wide discrepancies still exist in data collection and tabulation practices because of differences in the resources and information needs among countries. As a result, any attempt to compile standardized data across countries requires consideration of whether and how the reported data should be analyzed to achieve comparability. This caveat is particularly applicable to the present report because the IDB data are not accompanied by standard errors. Accordingly, no conclusions can be reached concerning the statistical significance of differences between population estimates presented in this report.

The demographic data in this report have been evaluated by Census Bureau analysts and are believed to be representative of the situation in a given country. The data are internally consistent and congruent with other facts known about the nations. These demographic data also have been checked for external consistency, that is, compared with information on other countries in the same region or subregion and with countries elsewhere at approximately the same level of socioeconomic development. The socioeconomic data, by contrast, typically are as reported by the countries themselves. Although Census Bureau analysts have not directly evaluated these data, analysts have attempted to resolve discrepancies in reported figures and eliminate international inconsistencies; data with obvious incongruities are not included.

People are living longer and, in some parts of the world, healthier lives. This represents one of the crowning achievements of the last century but also a significant challenge as proportions of older people increase in most countries.

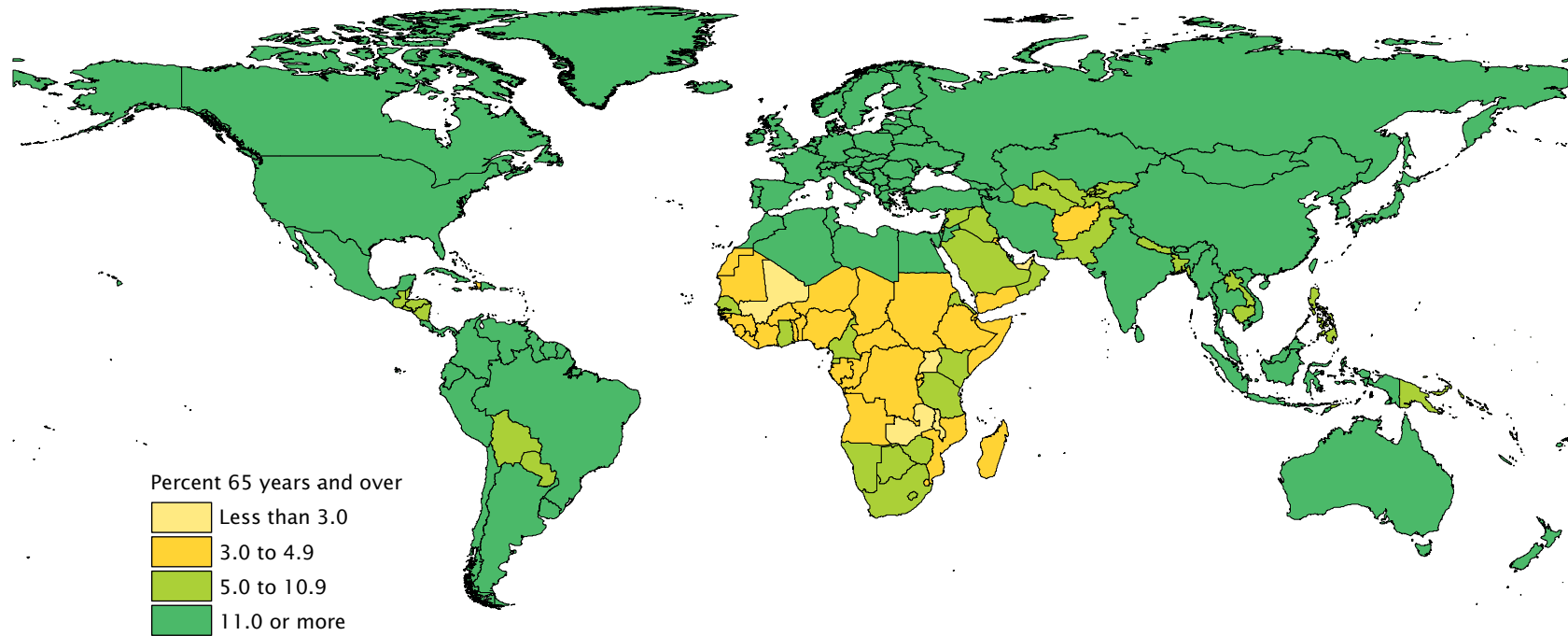
Figure 1-1.  
**Percent Population Aged 65 and Over: 2008**



Source: U.S. Census Bureau, International Data Base, accessed on May 27, 2008.



Figure 1-2.  
**Percent Population Aged 65 and Over: 2040**



Source: U.S. Census Bureau, International Data Base, accessed on May 27, 2008.

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Current growth of older populations is steady in some countries and explosive in others. As the World War II Baby Boom cohorts common to many countries begin to reach older age after 2010, there will be a jump in the proportion of the world's older population (Figures 1-1 and 1-2). Policymakers

need to understand the characteristics of older populations, their strengths, and their requirements. The effects will be felt not just within individual nations but throughout the global economy. Understanding the dynamics of aging requires accurate descriptions of older populations from

interrelated perspectives, including demographic, social, economic, medical, biological, and genetic. The IDB and this report are an effort to contribute to a consistent, systematic, quantitative comparison of older populations in various countries.

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## CHAPTER 2.

# Global Aging

The current level and pace of population aging vary widely by geographic region, and usually within regions as well, but virtually all nations are now experiencing growth in their number of older residents. While developed nations have relatively high proportions of people aged 65 and over, the most rapid increases in older population are in the developing world. Even in nations where the older percentage of the total population remains small, absolute numbers may be rising steeply. Everywhere, the growth of older populations poses challenges to social institutions that must adapt to changing age structures.

### OLDER PEOPLE TO SOON OUTNUMBER YOUNG CHILDREN

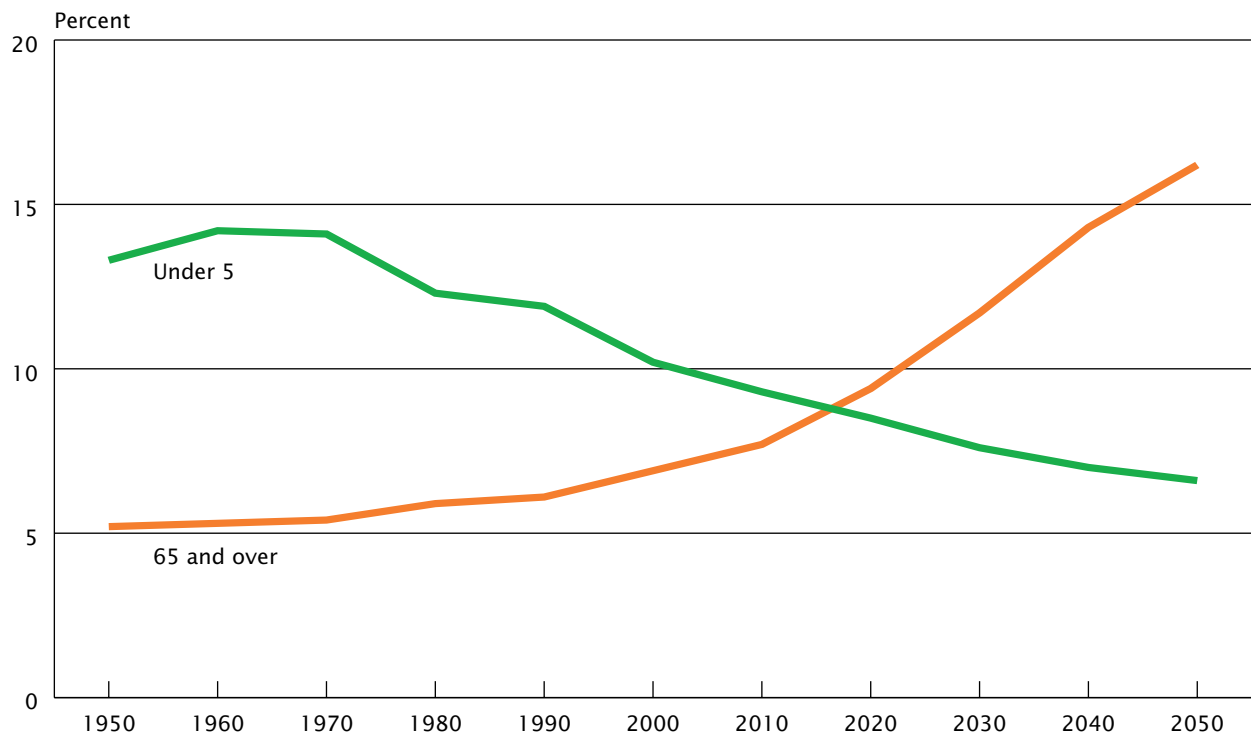
Estimates of the world's population age structure at various points in the past indicate that children under age 5 have outnumbered older people. In fewer than 10 years from now this will change (U.S. National Institute on Aging and U.S. Department of State, 2007). For the first time, people aged 65 and over are expected to outnumber children under age 5 (Figure 2-1). The global population aged 65 and over was estimated to be 506 million as of midyear 2008, about 7 percent of the world's population. By 2040, the world is projected to have 1.3 billion older people—accounting for 14 percent of the total.

### WORLD'S OLDER POPULATION INCREASING 870,000 EACH MONTH

The world's older population has been growing for centuries. What is new is the accelerating pace of aging. The world's older population of 506 million people in 2008 represented an increase of 10.4 million since 2007. The world's older population grew by an average of 870,000 people each month during the year. Projections 10 years hence suggest that the annual net increase will be on the order of 23 million, an average net monthly gain of 1.9 million people. In 1990, 26 nations had older populations of at least 2 million, and by 2008, 38 countries had reached the 2-million mark. Projections to the year 2040

Figure 2-1.

**Young Children and Older People as a Percentage of Global Population:  
1950 to 2050**



Source: United Nations Department of Economic and Social Affairs, 2007b.

indicate that 72 countries will have 2 million or more people aged 65 and over (Figure 2-2).




Projections of older populations may be more accurate than projections of total population, which must incorporate assumptions

about the future course of human fertility. Short-term and medium-term projections of tomorrow's older population are not contingent upon fertility because anyone who will be aged 65 or over in 2040 has already been born. When projecting the size and composition

of the world's future older population, human mortality is the key demographic component. However, uncertainties about changing mortality may lead to widely divergent projections of the size of tomorrow's older population.

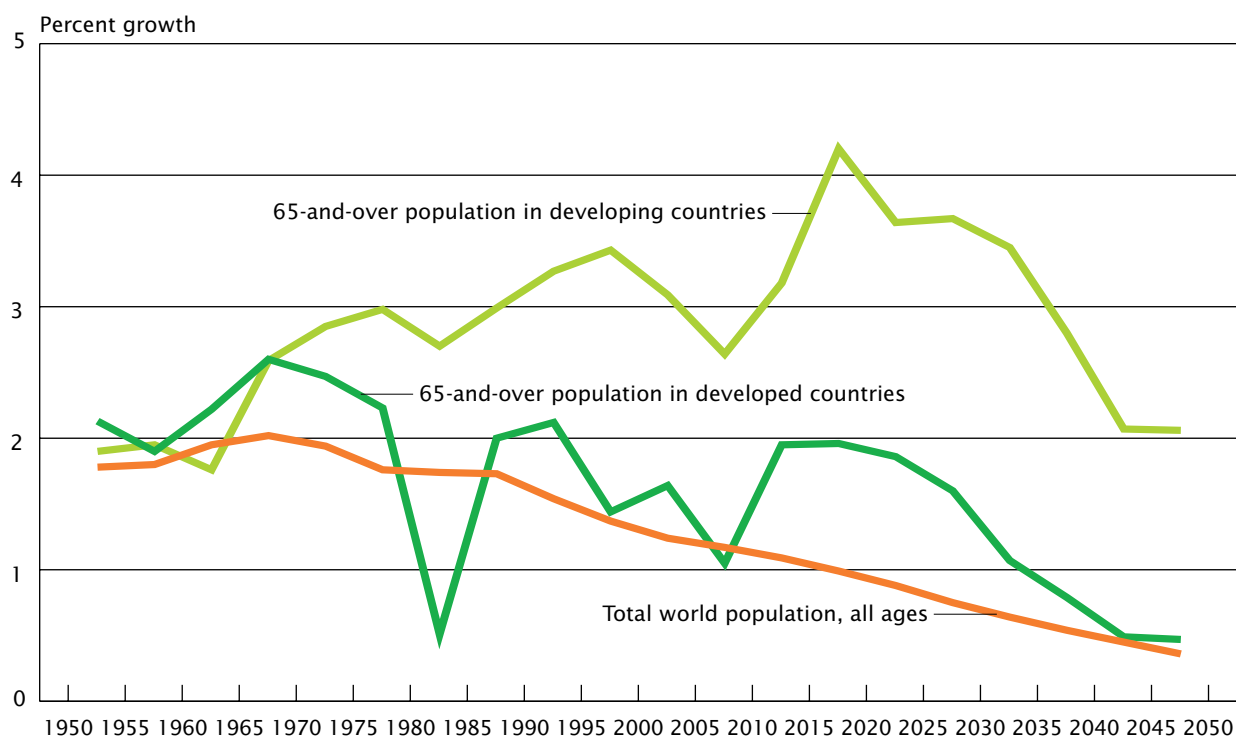
Figure 2-2.



-  Under 2 million in 2008 and 2040
-  2 million or more in 2008 and 2040
-  2 million or more in 2040, not in 2008

Source: U.S. Census Bureau, International Data Base, accessed on May 27, 2008.

Figure 2-3.  
**Average Annual Percent Growth of Older Population in  
 Developed and Developing Countries: 1950 to 2050**



Note: Based on average 5-year period growth rates.

Source: United Nations Department of Economic and Social Affairs, 2007b.

## OLDER POPULATION GROWING FASTEST IN DEVELOPING COUNTRIES

Population aging has become a widely known phenomenon in the industrialized nations of Europe and Northern America, but developing countries are aging as well, often at a much faster rate than in the developed world. Eighty-one percent (702,000 people) of the world's net gain of older individuals from July 2007 to July 2008 occurred in developing countries. As of 2008, 62 percent (313 million) of the world's people aged 65 and over lived in developing countries.

Figure 2-3 shows the different patterns of growth for older populations in developed and developing

countries. Most notable in developed countries is the steep plunge in growth in the early 1980s. The slowing of the growth rate may be attributed largely to the low birth rates that prevailed in many developed countries during and after World War I, combined with war deaths and the effects of the influenza pandemic of 1918–19. A second, less severe, decline in the rate of growth began in the mid-1990s and continued in the early 2000s. This decline corresponds to lowered fertility during the Great Depression and World War II. These drops in the growth rate highlight the important influence that past fertility trends have on current and projected changes in the size of older populations.

The current aggregate growth rate of the older population in developing countries is more than double that in developed countries and also double that of the total world population. The rate in developing countries began to rise in the early 1960s and has generally continued to increase until recent years. After a brief downturn—related to lower fertility during World War II—the older growth rate in developing countries is expected to rise beyond and remain above 3.5 percent annually from 2015 through 2030 before declining in subsequent decades. By 2040, today's developing countries are likely to be home to more than 1 billion people aged 65 and over, 76 percent of the projected world total.



## EUROPE STILL THE “OLDEST” WORLD REGION, SUB-SAHARAN AFRICA THE “YOUNGEST”

Eastern and Western Europe have had the highest population proportions aged 65 and over among

major world regions for many decades, and they should remain the global leaders well into the twenty-first century (Table 2-1).<sup>1</sup> By 2040, more than 1 of every 4

<sup>1</sup> See Appendix A for a list of countries in each of the regions used in this report.

Table 2-1.  
**Percent Older Population by Region: 2008 to 2040**

Region	65 years and over	75 years and over	80 years and over
<b>Northern Africa</b>			
2008 .....	4.9	1.6	0.7
2020 .....	6.7	2.2	1.1
2040 .....	12.8	5.0	2.5
<b>Sub-Saharan Africa</b>			
2008 .....	3.0	0.9	0.3
2020 .....	3.3	1.0	0.4
2040 .....	4.2	1.4	0.6
<b>Asia (excluding Near East)</b>			
2008 .....	6.8	2.4	1.1
2020 .....	9.3	3.3	1.7
2040 .....	16.2	6.8	3.7
<b>Near East</b>			
2008 .....	4.6	1.7	0.8
2020 .....	5.7	2.0	1.1
2040 .....	9.9	3.8	2.0
<b>Eastern Europe</b>			
2008 .....	14.5	6.0	3.0
2020 .....	17.3	6.9	4.3
2040 .....	24.4	12.6	7.8
<b>Western Europe</b>			
2008 .....	17.8	8.5	4.9
2020 .....	20.9	10.1	6.2
2040 .....	28.1	15.0	9.3
<b>Latin America/Caribbean</b>			
2008 .....	6.5	2.5	1.2
2020 .....	8.8	3.3	1.8
2040 .....	15.3	6.6	3.7
<b>Northern America</b>			
2008 .....	12.8	6.2	3.8
2020 .....	16.5	6.9	4.0
2040 .....	20.8	11.6	7.3
<b>Oceania</b>			
2008 .....	10.8	4.9	2.9
2020 .....	13.7	5.7	3.3
2040 .....	18.5	9.1	5.5

Source: U.S. Census Bureau, International Data Base, accessed on March 24, 2008.

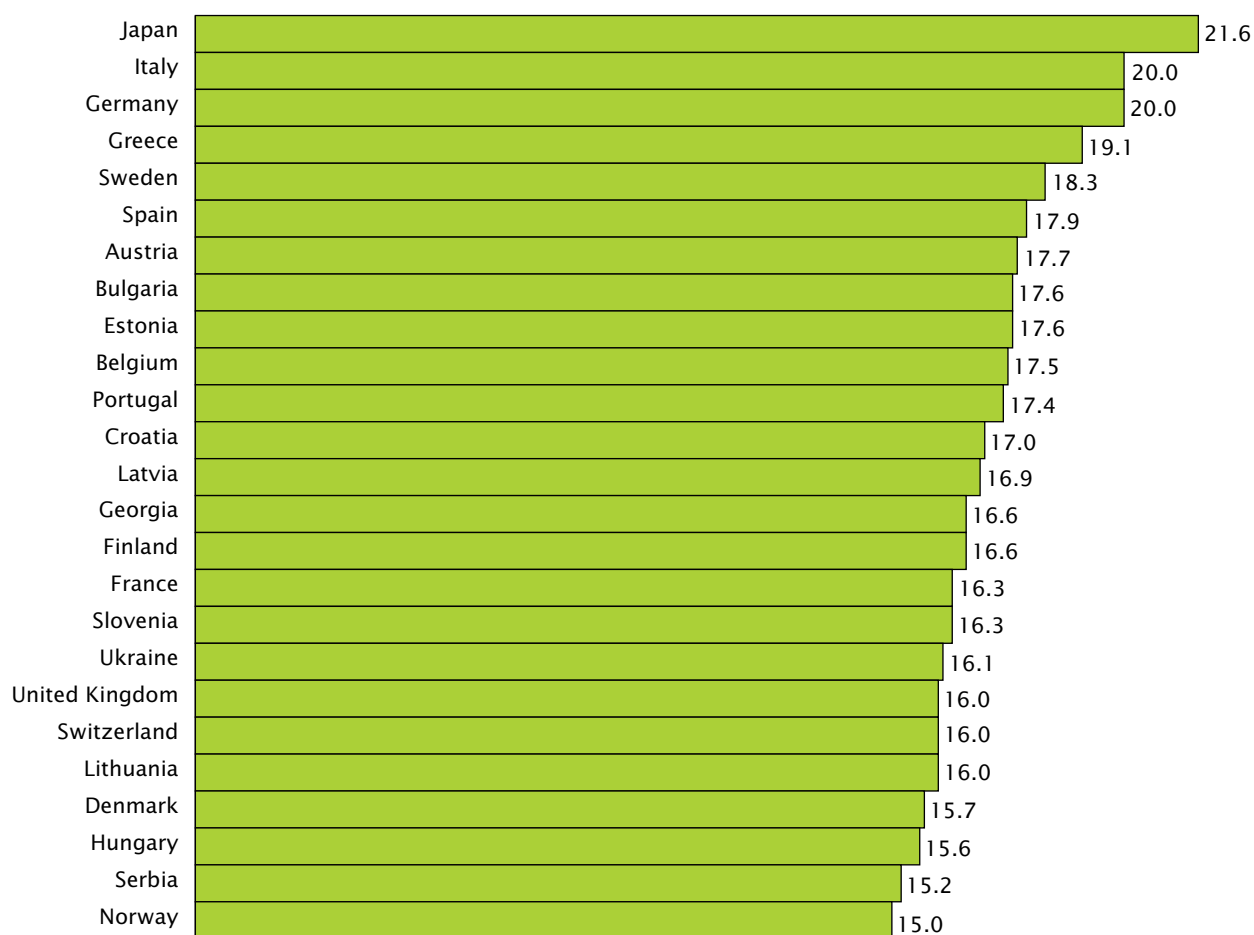
Europeans is likely to be at least 65 years of age, and 1 in 7 is likely to be at least 75 years old. Northern America and Oceania also have relatively high aggregate older population percentages today, and more than 1 in 5 people in Northern America is projected to be at least age 65 by 2040. Levels for 2008 in Northern Africa, Asia, and Latin America/Caribbean are expected to more than double by 2040, while aggregate proportions of the older population in Sub-Saharan Africa will grow rather modestly as a result of continued high fertility and, in some nations, the impact of HIV/AIDS (see Chapter 4).

Two important factors bear mention when considering aggregate older proportions of regional populations. The first is that regional averages often hide wide diversity. Bangladesh and Thailand may be close geographically, but these countries have divergent paths of expected population aging. Many Caribbean nations have high older population proportions (the Caribbean is the “oldest” of all developing world regions) in relation to their Central American neighbors. Second, and more important, percentages by themselves may not give a sense of population momentum. Although the change in the percent aged 65 and over in Sub-Saharan Africa from 2008 to 2020 is barely perceptible, the absolute number of older people is expected to jump by more than 40 percent, from 23.7 million to 33.3 million.

Figure 2-4.

# **The World's 25 Oldest Countries: 2008**

(Percent of population aged 65 years and over)



Source: U.S. Census Bureau, International Data Base, accessed on January 28, 2008.

## **JAPAN NOW THE WORLD'S "OLDEST" MAJOR COUNTRY**

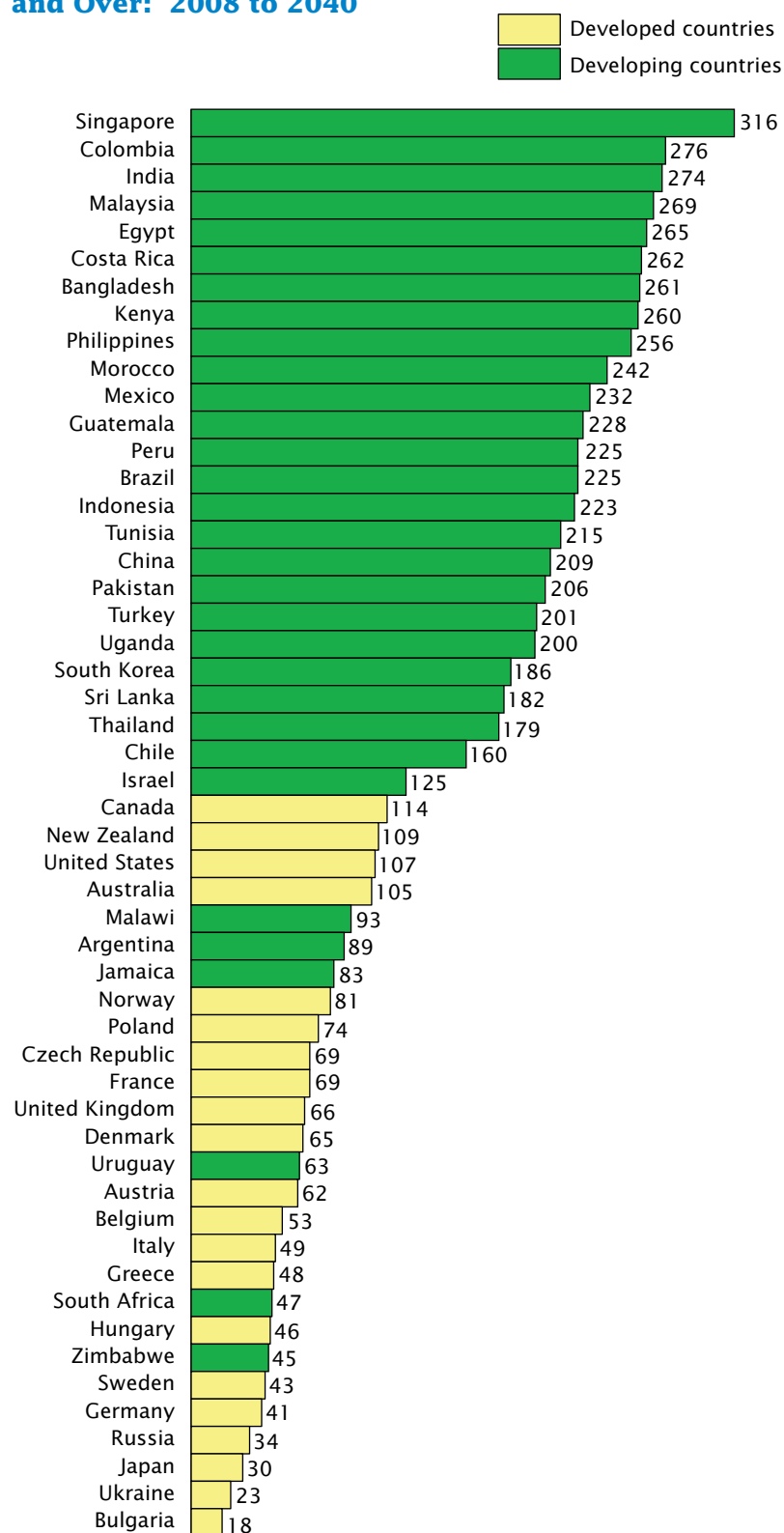
The percentage of the population aged 65 and over ranged from 13 percent to 21 percent in 2008 in most developed countries. For many years, Sweden or Italy had the highest such proportion, but recently Japan became the demographically oldest of the world's

major nations.<sup>2</sup> More than twenty-one percent of all Japanese are aged 65 and over, with levels of 18 percent to 20 percent seen in Germany, Greece, Italy, and Sweden. With the exception of Japan and Georgia, the world's 25 oldest countries are all in Europe (Figure 2-4). The United States,

<sup>2</sup> Some small areas/jurisdictions have high proportions of older residents. In 2008, 22 percent of all residents of the European principality of Monaco were aged 65 and over. Guernsey, the Isle of Man, and San Marino also had relatively high proportions (about 17 percent aged 65 and over in each).

with an older proportion of less than 13 percent in 2008, is rather young by developed-country standards. However, as the large birth cohorts of the post-World War II Baby Boom (people born from 1946 through 1964) begin to reach age 65 after 2010, the percent older in the United States will rise markedly—likely reaching 20 percent shortly after the year 2030. Still, this figure will be lower than that projected for most countries of Western Europe.

Figure 2-5.  
**Percent Increase in Population Aged 65  
and Over: 2008 to 2040**



Source: U.S. Census Bureau, International Data Base, accessed on January 17, 2008.

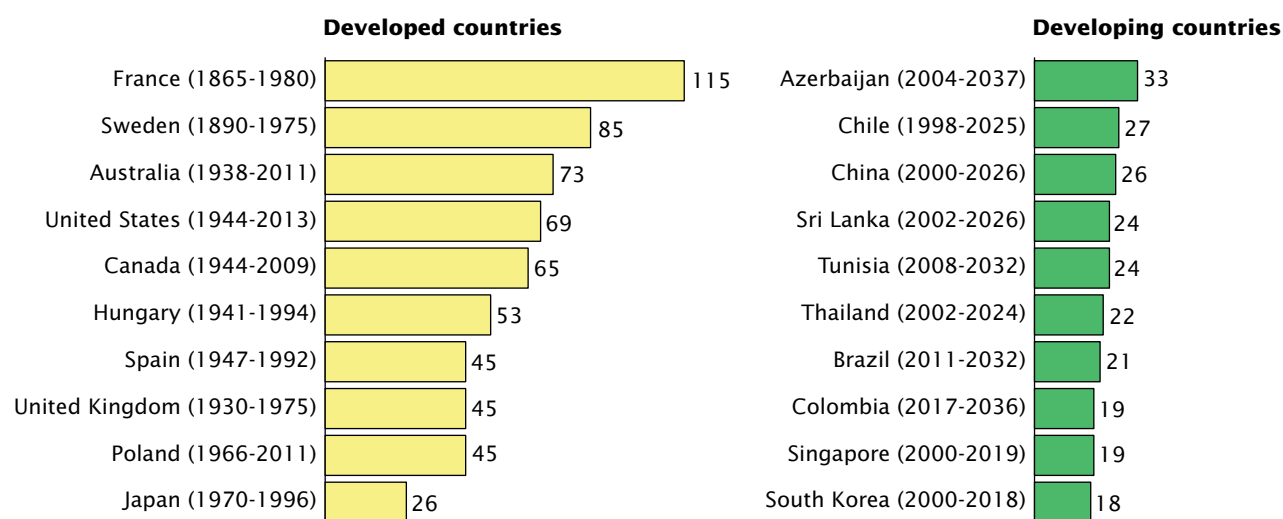
## SINGAPORE'S OLDER POPULATION TO MORE THAN TRIPLE BY 2040

During the period 2008–2040, the projected increase in the older population in the 52 study countries ranges from 18 percent in Bulgaria to 316 percent in Singapore (Figure 2-5). Today's "older" nations will experience relatively little change compared with many developing nations. In addition to Bulgaria, the projected increase in the 65-and-over population between 2008 and 2040 is less than 50 percent in Germany, Greece, Hungary, Italy, Japan, Russia, Sweden, and Ukraine. In contrast, gains of more than 250 percent are expected in many developing countries. Many of these are in Asia (e.g., Bangladesh, India, Malaysia, and the Philippines), but the list includes Colombia, Costa Rica, Egypt, and Kenya as well.

Figure 2-6.

## The Speed of Population Aging in Selected Countries

(Number of years required or expected for percent of population aged 65 and over to rise from 7 percent to 14 percent)



Sources: Kinsella and Gist, 1995; and U.S. Census Bureau, International Data Base, accessed on March 24, 2008.

## PARTS OF ASIA AGING THE FASTEST

Most of today's developed nations have had decades to adjust to changing age structures. For example, it took more than a century for France's population aged 65 and over to increase from 7 percent to 14 percent of the total population. Rapidly aging Japan is unusual among developed countries; the percent of the population aged 65 and over in Japan increased from 7 percent to 14 percent in 26 years, from 1970 to 1996 (Figure 2-6). In contrast to the usual

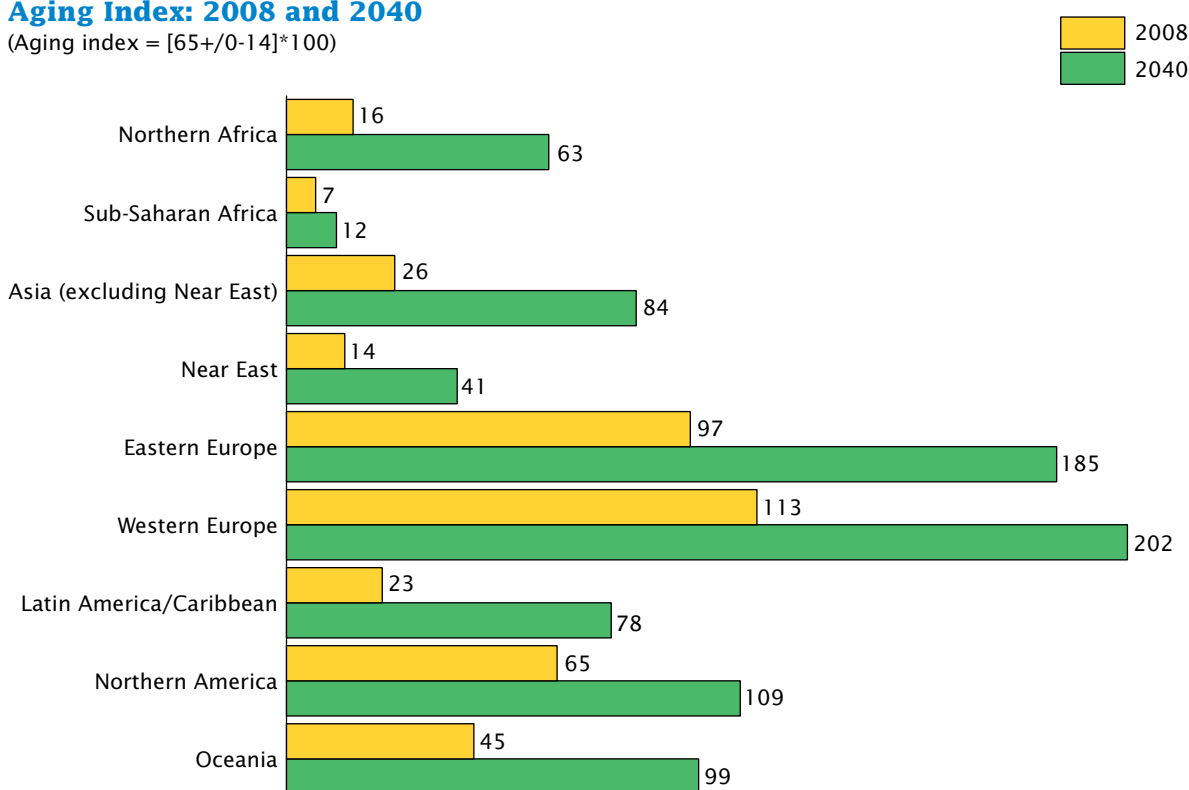
developed-country experience, many developing countries are experiencing (or soon will experience) a sudden rise in the number and percentage of older people, often within a single generation. Notably swift increases are expected in China and elsewhere in eastern and southeastern Asia, fueled by dramatic drops in fertility levels during the last three decades. The change in some other developing countries will be equally rapid; the same demographic aging process that unfolded over more than a century in France will likely occur in two decades in Brazil and Colombia.

In response to this "compression of aging," institutions in developing countries are called upon to adapt quickly to accommodate a new age structure. Some nations will be forced to confront issues, such as social support and the allocation of resources across generations, without the accompanying economic growth that characterized the experience of aging societies in the West. An often-heard maxim is that developed countries grew rich before they grew old, while many developing nations may grow old before they grow rich.

Figure 2-7.

### Aging Index: 2008 and 2040

(Aging index =  $[65+/0-14] \times 100$ )



Source: U.S. Census Bureau, International Data Base, accessed on January 15, 2008.

## AN AGING INDEX

An easily understood indicator of age structure is the aging index, defined here as the number of people aged 65 and over per 100 youths under age 15. Figure 2-7 shows the current and projected aging index by world region. The index presently is highest in Europe and lowest in Africa and the Near East. Today's aging index typically is much lower in developing countries than in the developed world, and the pattern of future change is likely to be more varied. If future fertility rates remain relatively high, as expected in Sub-Saharan Africa, the absolute change in the aging index will be small. Generally,

however, the proportional rise in the aging index in developing countries is expected to be larger than in developed countries.

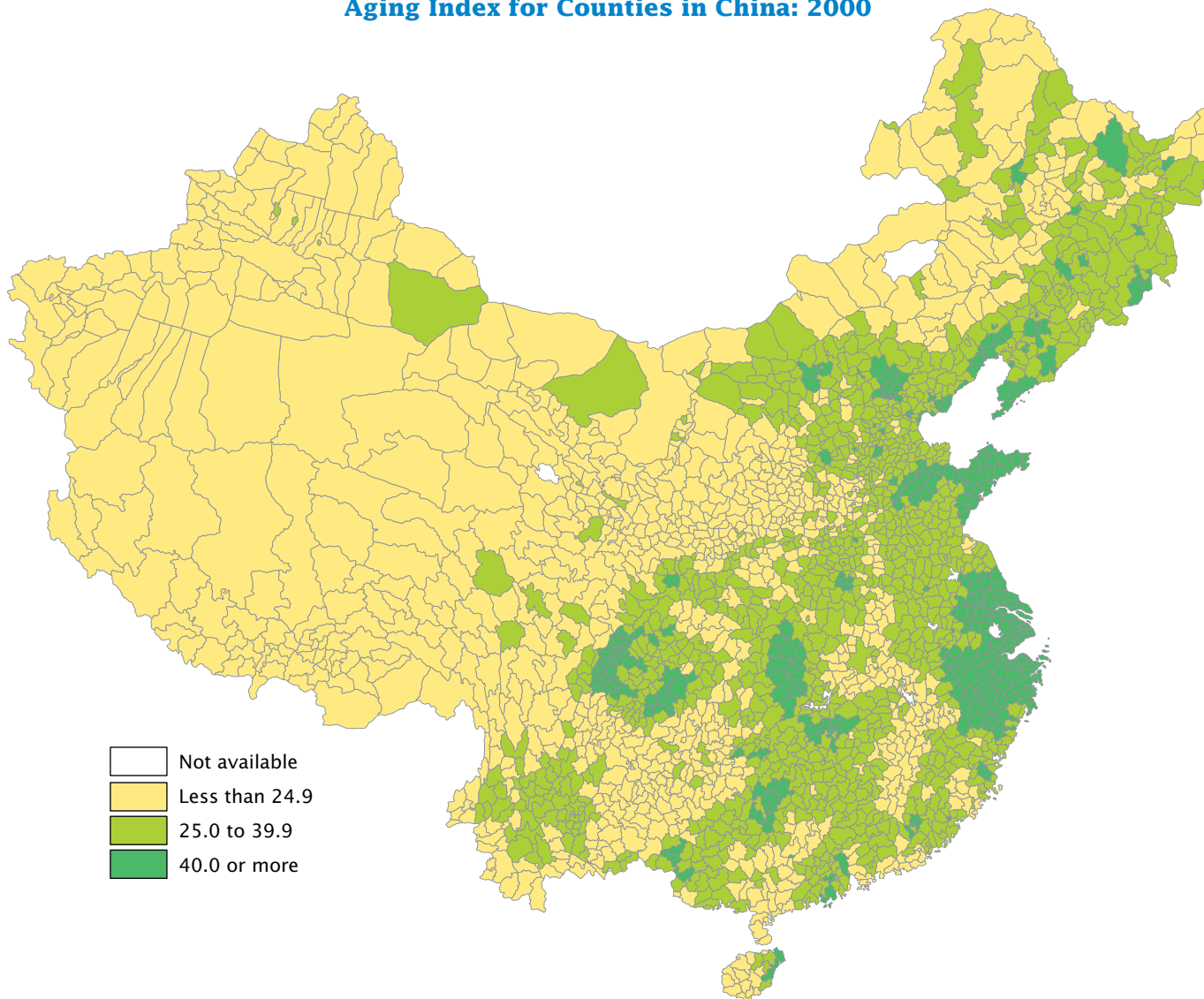
Among the 52 study countries in 2008, 10 European countries and Japan had more older people than youth aged 0 to 14. By 2040, all developed countries in Figure 2-5 are projected to have an aging index of at least 130, with the exception of the United States (104). The projected aging index in the United States is lower than in several developing countries, among them Chile, China, Sri Lanka, and Uruguay. By 2040, the aging index is expected to be in excess of 200 in ten of the study

countries, reaching 314 in Japan and 322 in Singapore.

The aging index also is useful for examining within-country differences in the level of population aging. As noted in Chapter 3, urban and rural areas may differ in the extent of aging. There may also be other geographic differences, especially in large nations such as China (Figure 2-8). Based on 2000 census data, the overall aging index in China was 31. However, this measure ranged from less than 20 in 510 counties, many of which are in the central and western regions, to more than 100 in Beijing and Shanghai and several surrounding counties.

Figure 2-8.

**Aging Index for Counties in China: 2000**



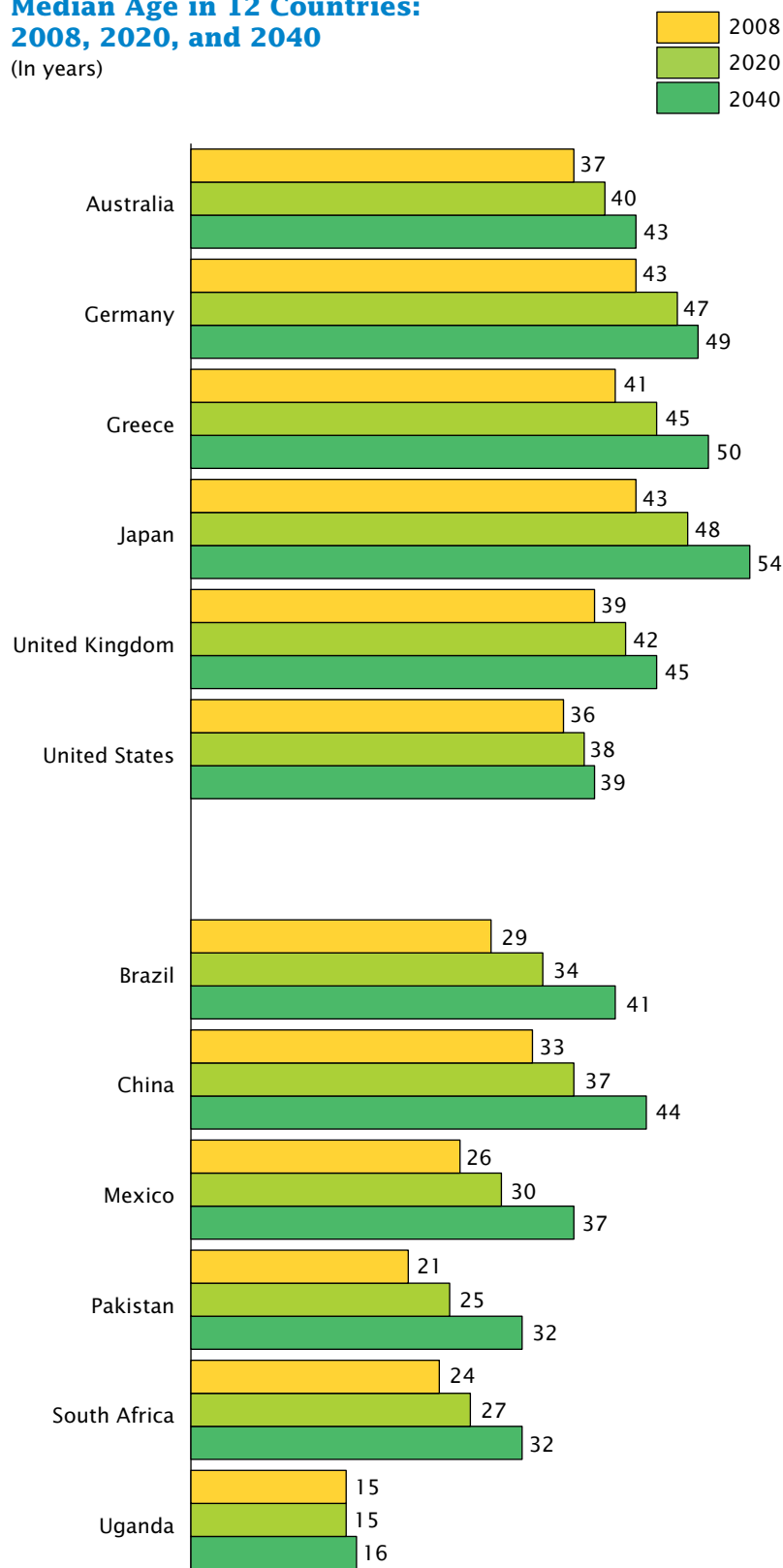
Source: China 2000 census data.



Figure 2-9.

### Median Age in 12 Countries: 2008, 2020, and 2040

(In years)



Source: U.S. Census Bureau, International Data Base, accessed on January 17, 2008.

### MEDIAN AGE TO RISE IN ALL COUNTRIES

Population aging refers most simply to increasing proportions of older people within an overall population age structure. Another way to think of population aging is to consider a society's median age, the age that divides a population into numerically equal parts of younger and older people. For example, the 2008 median age in the United States was 36 years, indicating that the number of people under age 36 equals the number who have already celebrated their 36th birthday.

The 2008 median ages of the 52 study countries ranged from 15 in Uganda to 44 in Japan. Developed countries are all above the 37-year level, with the exception of New Zealand (35) and the United States (36). A majority of developing nations have median ages under 27. During the next three decades, the median age will increase in all 52 countries, though at different rates. By 2040, Japan is projected to have the highest median age, with half of its population aged 54 and over (Figure 2-9). This is largely a reflection of recent and projected low levels of fertility. In contrast, persistently high birth rates (and in some cases the impact of adult AIDS deaths) are likely to constrain the 2040 median age to less than 30 in Malawi, Uganda, and Zimbabwe (Appendix Table B-3).

Box 2-1.

### Numbers and Percentages

Population aging is most commonly measured by the share of all people in a country or region above a certain age; for example, people aged 65 and over as a percentage of all people. Several other indicators of aging also may be used. This report includes measures such as the aging index, median age, the speed of aging, and the dependency ratio. One could also consider indicators such as average life expectancy or the proportion of total life expectancy lived after age 60 or 65. Sometimes overlooked are absolute numbers of older people. While Figure 2-4 shows the world's oldest countries according to the percentage of the population aged 65 and over, Table 2-2 ranks the top 25 countries in terms of the absolute size of the 65-and-over population in 2008.

Table 2-2.

### Rank Order of the World's 25 Largest Older Populations: 2008

(In millions)

Rank	Country	Population aged 65 and over
1	China .....	106.1
2	India .....	59.6
3	United States .....	38.7
4	Japan .....	27.5
5	Russia .....	19.9
6	Germany .....	16.5
7	Indonesia .....	13.9
8	Brazil .....	12.3
9	Italy .....	11.7
10	France .....	10.4
11	United Kingdom .....	9.7
12	Ukraine .....	7.4
13	Spain .....	7.3
14	Pakistan .....	7.2
15	Mexico .....	6.7
16	Thailand .....	5.5
17	Bangladesh .....	5.4
18	Poland .....	5.1
19	Turkey .....	5.1
20	Vietnam .....	5.0
21	South Korea .....	4.9
22	Canada .....	4.6
23	Argentina .....	4.4
24	Nigeria .....	4.3
25	Philippines .....	3.9

Source: U.S. Census Bureau, International Data Base, accessed on February 19, 2008.

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## CHAPTER 3.

# The Dynamics of Population Aging

The process of population aging has been, in most countries to date, determined primarily by fertility (birth) rates and secondarily by mortality (death) rates. Populations with high fertility tend to have low proportions of older people and vice versa. Demographers use the term “demographic transition” (see Box 3-1) to refer to a gradual process wherein a society moves from a situation of relatively high rates of fertility and mortality to one of low rates of fertility and mortality. This transition is characterized first by declines in infant and childhood mortality as infectious and parasitic diseases are reduced. The resulting improvement in life expectancy at birth occurs while fertility tends to remain high, thereby producing large birth cohorts and an expanding proportion of children relative to adults. Other things being equal, this initial decline in mortality generates a younger population age structure.

Generally, populations begin to age when fertility declines and

adult mortality rates improve. Successive birth cohorts may eventually become smaller and smaller, although countries may experience a “baby boom echo” as women of prior large birth cohorts reach childbearing age. International migration usually does not play a major role in the aging process but can be important in smaller populations. Certain Caribbean nations, for example, have experienced a combination of emigration of working-aged adults, immigration of older retirees from other countries, and return migration of former emigrants who are above the median population age—all of which contribute to population aging. In the future, international migration could assume a more prominent role in the aging process, particularly in graying countries where persistently low fertility has led to stable or even declining total population size. Shortages of younger workers may generate demands for immigrant labor, and many developed countries have reconsidered their immigration

policies (Salt, Clarke, and Wanner 2004; and Vignon, 2005).

Figure 3-1 illustrates the historical and projected aggregate population age transition in developing and developed countries. At one time, most, if not all, countries had a youthful age structure similar to that of developing countries as a whole in 1960, with a large percentage of the entire population under the age of 15. Given the relatively high rates of fertility that prevailed in many developing countries in the 1960s and 1970s, the overall pyramid shape had not changed radically by 2000. However, the beginnings of fertility decline can be seen in the roughly equal sizes of the youngest three age groups. The effects of fertility and mortality decline can be seen much more clearly in the projected pyramid for 2040, which loses its strictly triangular shape as the size of younger 5-year cohorts stabilizes and the older portion of the total population increases.

The picture in developed countries has been and will be quite different. In 1960, there was relatively little variation in the size of 5-year groups between the ages of 5 and 34. The effect of the post-World War II Baby Boom can be seen in the 0–14 age range. By 2000, the Baby Boom cohorts were aged 35 to 54, and younger cohorts were

becoming successively smaller. If fertility rates continue as projected through 2040, the aggregate pyramid will start to invert, with more weight on the top than on the bottom. The size of the oldest-old population (especially women) will increase, and people aged 80 and over may eventually outnumber any younger 5-year group. Although the

effect of fertility decline usually has been the driving force in changing population age structures, current and future changes in mortality will assume greater weight, particularly in relatively “aged” countries, as discussed in the next chapter (Janssen, Kunst, and Mackenbach, 2007).

### Box 3-1.

## Demographic Transition Theory and the Age-Sex Composition of Populations

Demographers have identified a general progression of changes in fertility, mortality, and population composition through which populations have typically passed in the modern era, articulated as demographic transition theory (Davis, 1945). The concept of demographic transition admittedly is a broad one, and some argue that it has many permutations or that there is more than one form of demographic transition (see, for example, Coale and Watkins, 1986). Still, the theory offers a useful starting point from which to explain changes in observed age-sex compositions during the past century.

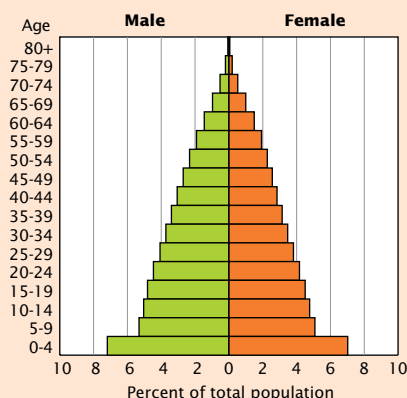
The theory begins with the observation that, at one time, most developed societies had high levels of both fertility and mortality and a corresponding low rate of growth (Stage 1). A picture of such a population has a narrow pyramidal shape with relatively few people at the older ages.

The second stage of demographic transition consists of a substantial drop in levels of mortality, especially infant mortality. Because fertility levels stay high, the result is a rapid increase in population, particularly at the younger ages. A pyramid of a population at this stage is

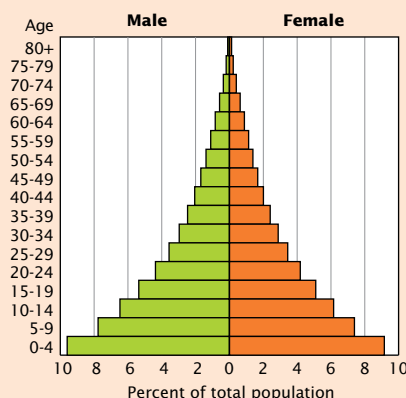
triangular in shape, with a wide base that reflects large cohorts of children at the youngest ages and progressively smaller cohorts at each successive age.

The next change that affects populations is a decline in the level of fertility (Stage 3), which causes a slowing of the rate of population growth and eventually a more even distribution across age groups. A population pyramid at the end of this stage is more rectangular in shape, and the older age groups are much weightier.

**Population at Stage 1 of the Demographic Transition**



**Population in Stage 2 of the Demographic Transition**



**Population at the End of Stage 3 of the Demographic Transition**

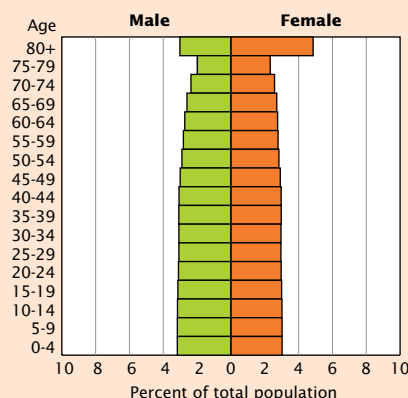
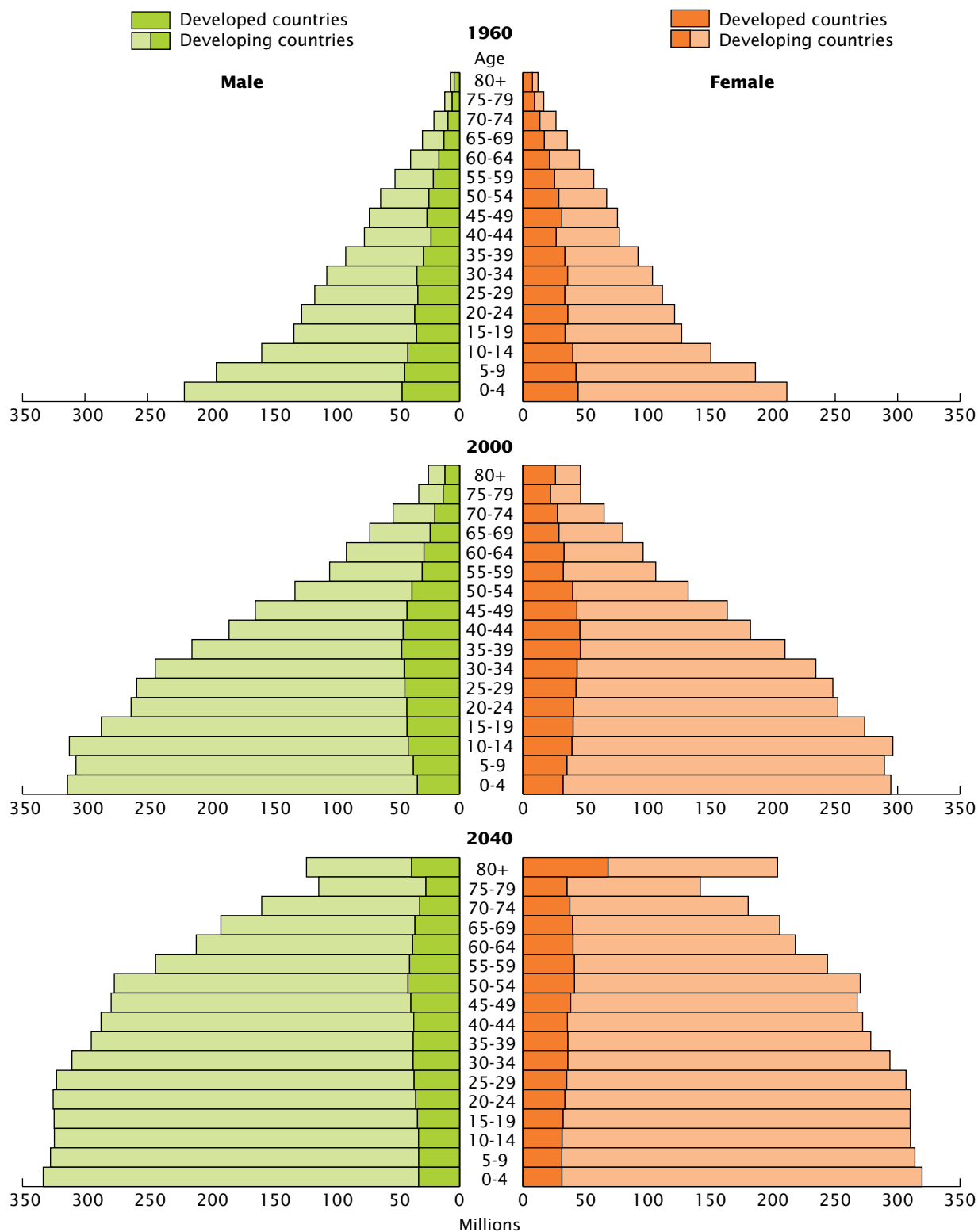


Figure 3-1.

# **Population in Developed and Developing Countries by Age and Sex: 1960, 2000, and 2040**



Sources: United Nations Department of Economic and Social Affairs, 2007b; and U.S. Census Bureau, International Data Base, accessed on December 28, 2007.

## LEGACY OF FERTILITY DECLINE

The most prominent historical factor in population aging has been fertility decline. The generally sustained decrease in total fertility rates (TFRs) in industrialized nations since at least 1900 has resulted in current levels below the population replacement rate of 2.1 live births per woman in most such nations<sup>1</sup> (Figure 3-2). Persistent low fertility since the late 1970s has led to a decline in the size of successive birth cohorts and a corresponding increase in the proportion of the older population relative to the younger population.

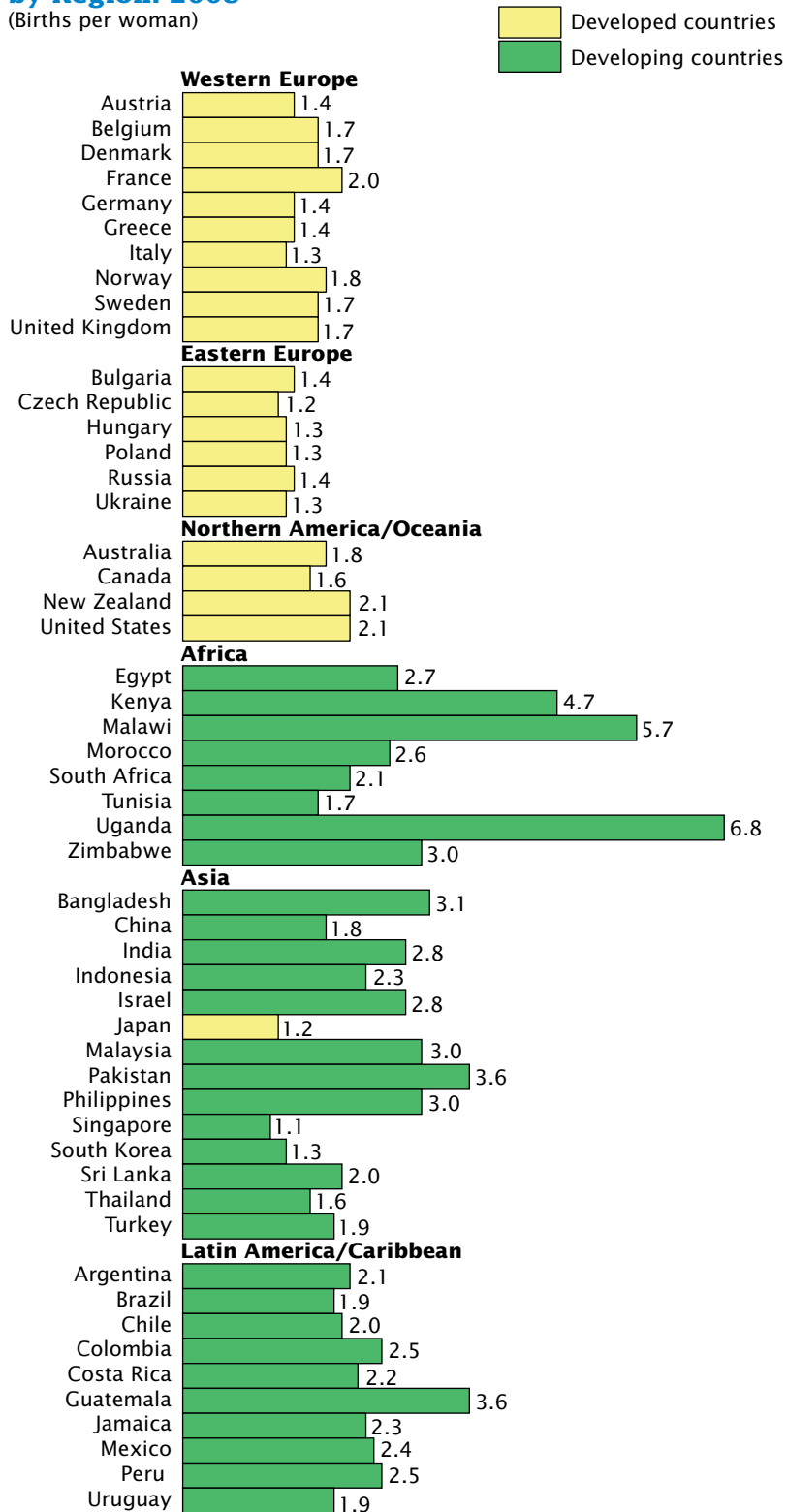
Fertility change in the developing world has been more recent and more rapid, with most regions having achieved major reductions in fertility rates over the last 35 years. Although the aggregate TFR remains in excess of 4.5 children per woman in Africa, overall levels in Asia and Latin America decreased by about 50 percent (from 6 to 3 children per woman) during the period 1965 to 1995 and further to around 2.3 today. U.S. Census Bureau projections indicate that fertility in 2008 was at or below the replacement level in more than 40 developing countries. Many of these nations have relatively small populations (e.g., Caribbean and Pacific island nations), but the list includes China, Brazil, and Vietnam—three countries that together are home to 24 percent of the world's population.

<sup>1</sup> The total fertility rate (TFR) is defined as the average number of children that would be born per woman if all women lived to the end of their childbearing years and bore children according to a given set of age-specific fertility rates. The replacement rate is the total fertility rate at which women would have only enough children to replace themselves and their partner. The replacement rate for a given population depends upon the level of mortality, especially infant, childhood, and maternal.

Figure 3-2.

### Total Fertility Rate for Selected Countries by Region: 2008

(Births per woman)

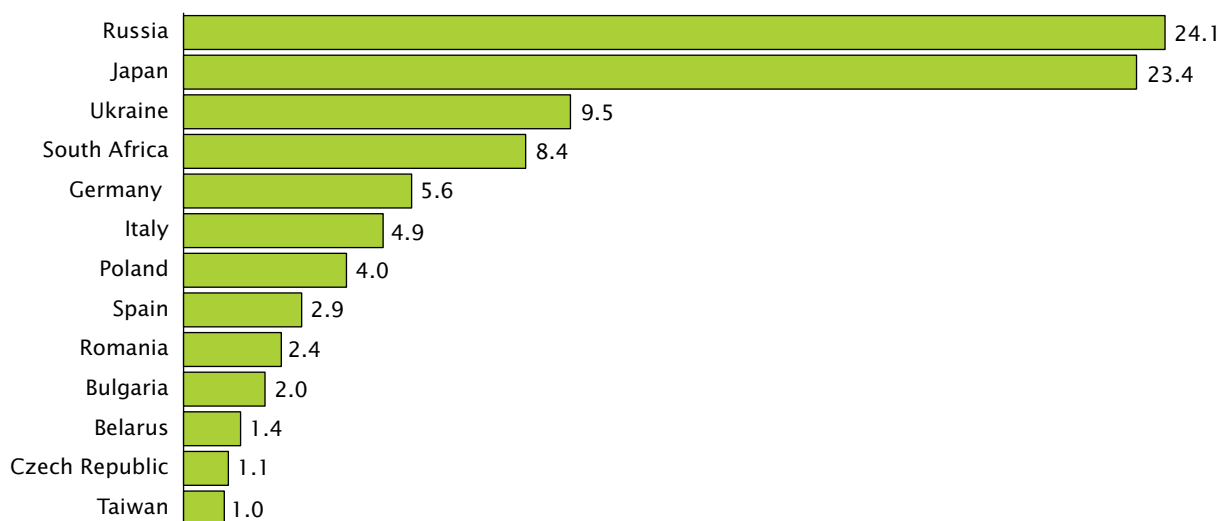


Source: U.S. Census Bureau, International Data Base, accessed on January 17, 2008.

Figure 3-3.

### Countries/Areas With a Projected Population Decline of at Least 1 Million Between 2008 and 2040

(In millions)



Source: U.S. Census Bureau, International Data Base, accessed on January 22, 2008.

### AGING AND POPULATION DECLINE: AN UNPRECEDENTED DEVELOPMENT

Some countries are witnessing an historically unprecedented demographic phenomenon: simultaneous population aging and overall population decline. European demographers have sounded warning bells for at least the last 35 years about the possibility of declining population size in industrialized nations, but this idea did not permeate public discourse until recently. Current population projections indicate that 28 developed countries and 7 developing countries may likely experience declines in the size of their populations over the upcoming decades; in some countries (e.g., Estonia, Italy, Japan, and Ukraine), the decline has already begun. Some of

these decreases will be substantial. Russia's population is expected to shrink by 24 million people between 2008 and 2040, a drop of 21 percent. Twelve other countries are projected to experience a population decline of at least 1 million people during the same period (Figure 3-3). In the developed world, population decline is coupled with population aging. While Japan's total population is projected to decrease by nearly 24 million, the population aged 65 and over is projected to increase by 8 million between 2008 and 2040. The proportion of the population aged 65 and older in Japan is projected to increase from 22 percent in 2008 to 34 percent in 2040.

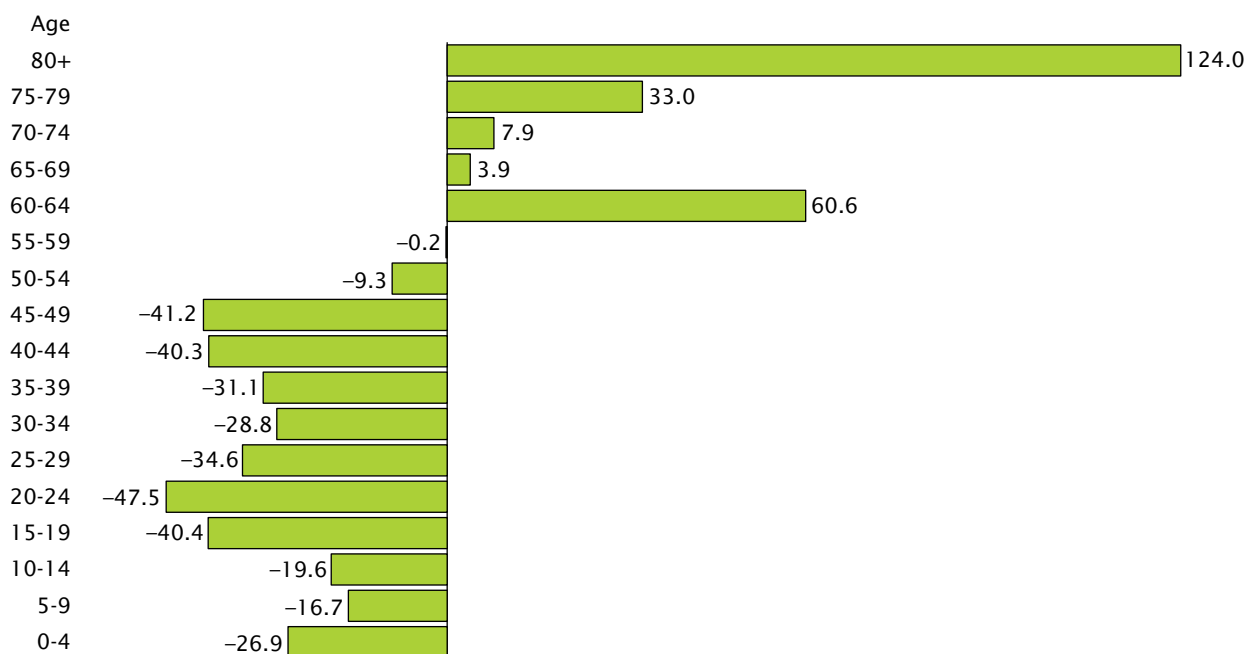
Declines in population size in developed countries are the result of extremely low fertility (e.g., Russia and Japan have total fertility

rates of 1.4 and 1.2 births per woman, respectively—substantially below the level needed to replenish a population in the absence of migration). The developing countries that are experiencing or may experience population declines typically are also experiencing high mortality related to HIV/AIDS. For example, South Africa's population in 2040 may be 8 million people lower than in 2008 due to elevated mortality. Life expectancy at birth in South Africa fell from 60 years in 1996 to less than 43 years in 2008. Lesotho, Namibia, and Swaziland are also projected to have an HIV/AIDS-related decline in their populations between 2008 and 2040. This expected population decline will occur at the same time that the proportion aged 65 and over in these countries is increasing.

Figure 3-4.

### Projected Age-Specific Population Change in Russia Between 2008 and 2040

(Percent)



Source: U.S. Census Bureau, International Data Base, accessed on January 22, 2008.

Challenges for planning arise from age-specific population changes.

For example, Figure 3-4 shows that in Russia, all age groups below age 60 are likely to decline in size between 2008 and 2040, while the older age groups increase. This suggests that the demand for health care services might outweigh the need to build more schools. Since the number of younger adults of working age is anticipated to decline, the working-aged population available to contribute to the economy and pension systems is shrinking while the older nonworking population is increasing. At the same time, the age-specific changes strongly suggest that companies may have a difficult time attracting

sufficient numbers of workers for economic expansion.

This shifting age structure is seen in many developed countries, including those that are not likely to undergo population decline in the foreseeable future. Both France and the United Kingdom, for example, are projected to experience an increase in their population between 2008 and 2040, but their projected age-specific population change is similar to that for Russia.

Various researchers and organizations have examined the likely impact of migration as a counterbalance to aging. The consensus is that flows of migrants to Europe will not prevent population

declines in the future or rejuvenate national populations unless the migration flows are large (i.e., millions annually) and much higher than in the recent past. So-called “replacement migration” does not appear to be a viable solution in and of itself, but it could buffer the likely impact of future aging if it occurs in conjunction with other developments such as increased labor force participation, especially among women but also at older ages generally, and fertility inducements as explained below (United Nations Department of Economic and Social Affairs, 2001; and Fehr, Jokisch, and Kotlikoff, 2003).



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## IS BELOW-REPLACEMENT FERTILITY HERE TO STAY?

In the 1990s, demographers and others began to ask if persistent below-replacement fertility was a threat to European and other societies and if so, could it be altered? A theory of the “second demographic transition” evolved, incorporating not only the persistence of low fertility but also the emergence of widespread cohabitation, childbearing outside of marriage, single parenthood, and changes in attitudes and norms regarding marriage and sexual behavior (Lesthaeghe and Surkyn, 2004; and Coleman, 2005). A major question is whether the decline in fertility will level off and perhaps reverse, as population projections typically assume, or whether birth rates will continue to decline. One study (National Research Council, 2000) examined the experience of the diverse set of countries that have made the transition to low fertility. In few of these countries has fertility stabilized at rates above two children per woman. Such stabilization would depend on substantial proportions of higher-order births (i.e., four or more births for some women), but such higher-order births are largely anachronistic in industrial-country settings. The National Research Council’s tentative conclusion was that fertility is unlikely to rebound significantly. A more recent review of literature on the subject found that expert views on the future trajectory of fertility were roughly divided (Lutz, 2006). Lutz, Skirbekk, and Testa (2006) formulated a low-fertility-trap hypothesis that self-reinforcing

mechanisms may produce a continual downward pressure on the level of fertility. These mechanisms include (1) a demographic force, that fewer potential mothers in the future will result in fewer births; (2) a sociological factor, that ideal family size for younger cohorts is declining; and (3) an economic dimension, that involves conflict between rising aspirations and declining real income.

Many industrial societies already provide incentives for having children, though the explicit aim is often family welfare rather than increasing birth rates. Governments employ various means to affect fertility, including direct financial incentives for additional births; indirect pension (i.e., early retirement) or in-kind benefits, such as preferential access for mothers with many children to subsidized housing; and measures to reduce the opportunity costs of additional childbearing (Lutz and Skirbekk, 2005; and Stamenkova and Chernev, 2006). Many European nations have adopted more generous parental leave schemes and most have programs to provide cash support to families with children. In 2004, Australia introduced a payment of A\$3,000 for each birth, and South Korea offers financial incentives for couples to have a second child (United Nations Economic and Social Council, 2007). The efficacy of such programs is uncertain; some experts contend that changing the demographic landscape requires not just birth incentives but broader integrated policies that address support for families with

children and social integration of younger people (Botev, 2006; and McDonald, 2006).

## OLDER POPULATIONS THEMSELVES OFTEN ARE AGING

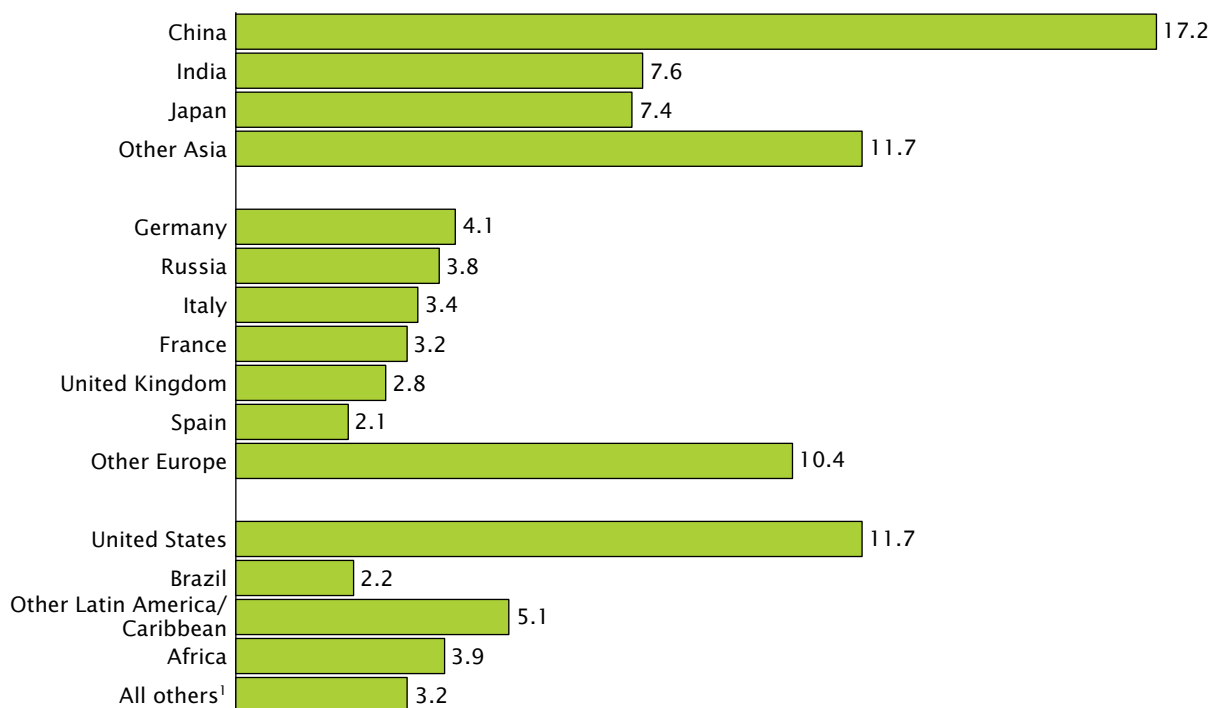
An increasingly important feature of societal aging is the aging of the older population itself. A nation’s older population often grows older, on average, as a larger proportion survives to 80 years and beyond. A nation’s oldest-old population (defined in this report as people aged 80 and over) consumes resources disproportionately to its overall population size (Zhou, Norton, and Stearns, 2003). The numerical growth of the oldest old means, among other things, that pensions and retirement income will need to cover more people living into their 80s and beyond, health care costs may rise, and intergenerational relationships may take on an added dimension if young children know their great-grandparents. Demographers expect a large numerical growth of centenarians, whose experiences may yield empirical clues about the process of aging on both an individual and a population level.

In the mid-1990s, the aggregate global growth rate of the oldest old was somewhat lower than that of the world’s older population as a whole, a result of low fertility that prevailed in some countries around the time of World War I and the effects of the influenza pandemic of 1918–19. People who were reaching age 80 in the mid-1990s were part of a relatively small birth cohort. The growth rate of the

Figure 3-5.

### Global Distribution of People Aged 80 and Over: 2008

(Percent of world total in each country/region)



<sup>1</sup> "All others" includes Oceania and Northern America except the United States.

Notes: Individual countries with more than 2 percent of the world's total are shown separately. Figures may not sum to 100 percent due to rounding.

Source: U.S. Census Bureau, International Data Base, accessed on January 19, 2008.

world's oldest-old population from 1996 to 1997 was 1.3 percent. Just a few years later, however, the low-fertility effects of World War I had dissipated; from 1999 to 2000, the growth rate of the world's 80-and-over population jumped to 3.5 percent, higher than that of the world's older population as a whole (2.3 percent). Today, the oldest old are the fastest-growing portion of the total population in many countries. On a global level, the 80-and-over population is projected to increase 233 percent between 2008 and 2040, compared with 160 percent for the population aged

65 and over and 33 percent for the total population of all ages.<sup>2</sup>

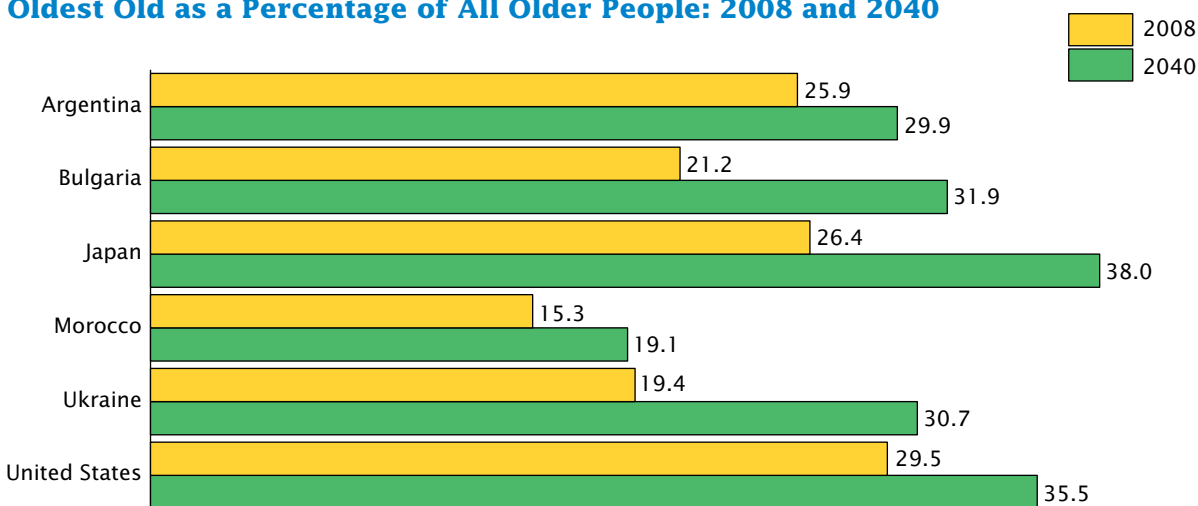
<sup>2</sup> Past population projections often have underestimated the improvement in mortality rates among the oldest old (National Research Council, 2000), and as the next chapter points out, the actual number of tomorrow's oldest old could be much higher than presently anticipated. As the average length of life increases, the concept of oldest old will change. Because of the sustained increases in longevity in many nations, more detailed information is needed on growing, heterogeneous oldest-old populations. In the past, population projections for the world's countries often grouped everyone aged 80 and over into a single, open-ended component. In the early 2000s, agencies such as the United Nations Population Division and the U.S. Census Bureau's Population Division began producing sets of international population projections that expanded the range of older age groups up to an open-ended category of age 100 and over.

The oldest old constituted 19 percent of the world's older population in 2008—26 percent in developed countries and 15 percent in developing countries. More than half (52 percent) of the world's oldest old (and total population) in 2008 lived in six countries: China, the United States, India, Japan, Germany, and Russia (Figure 3-5). An additional 22 percent lived elsewhere in Europe, 12 percent lived elsewhere in Asia, and 7 percent lived in Latin America and the Caribbean.

Among the 52 study countries, the percentage of oldest old in the total population in 2008 was half

Figure 3-6.

### Oldest Old as a Percentage of All Older People: 2008 and 2040



Source: U.S. Census Bureau, International Data Base, accessed on January 22, 2008.

a percent or less in several developing countries (e.g., Bangladesh, Egypt, Malawi, and Uganda). In contrast, the oldest old constituted 5.7 percent of the total population of Italy and Japan and at least 5 percent in Belgium, France, and Sweden. In general, Western European nations are above 4 percent, while other developed countries are between 3 percent and 4 percent. Less than 1 percent of the population is aged 80 and over in a majority of developing nations.

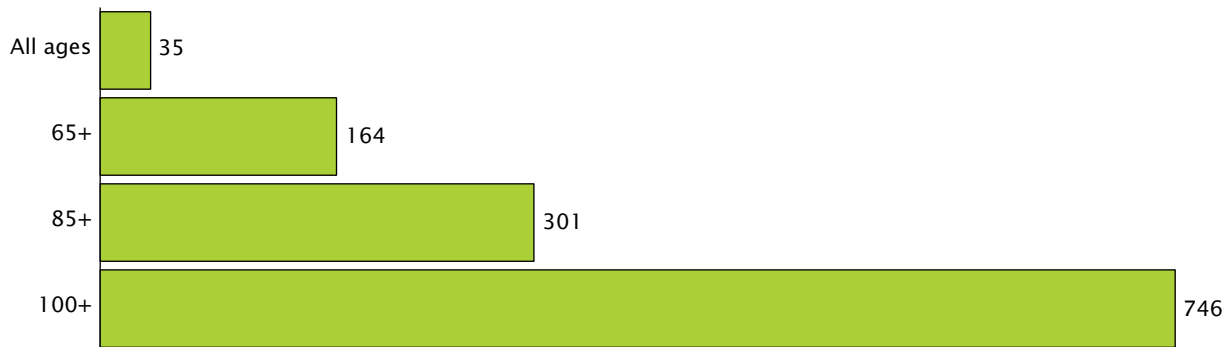
Countries vary considerably in the projected age components of their older populations. In the United States, the oldest old were about 30 percent of all older people in 2008, and they are projected to

constitute 36 percent in 2040 (Figure 3-6). Some European nations will experience a sustained rise in this ratio, while others will see an increase during the next decade and then a subsequent decline. A striking increase is likely to occur in Japan; by 2040, 38 percent of all older Japanese are expected to be at least 80 years old, up from 26 percent in 2008. Most developing countries are expected to experience modest long-term increases in this ratio.

However, even modest changes in the proportion of oldest old in the older population can coincide with burgeoning absolute numbers. The oldest old in the United States increased from 374,000 in 1900 to

more than 11 million in 2008. The relatively small percentage-point increase in Figure 3-6 represents a projected absolute increase of over 17 million oldest-old people. As global longevity lengthens and the number of the oldest old multiply, four-generation families may become more common. This possibility is offset, however, by trends in delayed marriage and rising ages at childbearing. In any event, the aging of post-World War II Baby Boomers could produce a great-grandparent boom in certain countries. Some working adults will need to provide educational expenses for their children while simultaneously supporting their parents and possibly their grandparents.

Figure 3-7.  
**Percent Change in the World's Population: 2005 to 2040**



Source: United Nations Department of Economic and Social Affairs, 2007b.

### RESEARCHERS EYE INCREASE IN CENTENARIANS

While people of extreme old age constitute a tiny portion of total population in most of the world, their numbers are growing, especially in developed nations. Thanks to improvements in nutrition, health, and health care, the population aged 100 and over is increasing notably. Researchers in Europe found that the number of centenarians in industrialized countries doubled each decade between 1950 and 1990. Using reliable statistics from ten Western European countries and Japan, Vaupel and Jeune (1995) 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.

They also estimate that, over the course of human history, the odds of living from birth to age 100 may have risen from 1 in 20 million to 1 in 50 for females in low-mortality nations, such as Japan and Sweden. Scientists are now studying data on centenarians for clues about factors that contribute to longevity (Willcox et al., forthcoming). For example, a recent analysis of U.S. centenarians born in the 1880s suggests that a lean body mass and having large numbers of children were associated with extreme longevity, whereas immigration and marital status were not statistically significant predictors (Gavrilov and Gavrilova, 2007).

Estimates of centenarians from censuses and other data sources should be scrutinized carefully, as there are several problems with obtaining accurate age data on very old people. The 1990 U.S.

census recorded about 37,000 centenarians, but the actual figure is thought to be closer to 28,000 (Krach and Velkoff, 1999). Census 2000 recorded more than 50,000 centenarians, but this figure is artificially high due to age misreporting, data processing errors, and allocation of extreme age (Humes and Velkoff, 2007). Nevertheless, it seems clear that the number of centenarians is rising. On the global level, the United Nations (Department of Economic and Social Affairs, 2007b) estimates that the population of centenarians was about 270,000 as of 2005. By 2040, this number is projected to reach 2.3 million. Figure 3-7 shows the projected percent change in three age groupings of the older population and illustrates the rapidity of change at the oldest ages relative to the older population as a whole and to the overall population growth rate.

Table 3-1.  
**Percent Population Aged 65 and Over for 20 Cities  
 Compared With the Respective National Average:  
 Selected Years, 1999 to 2007**

(In percent)

City, country	Year	City	National average
Beijing, China	2000	8.6	7.1
Budapest, Hungary	2001	17.6	15.1
Calcutta, India	2001	6.7	4.8
Copenhagen, Denmark	2007	10.9	15.3
Dublin, Ireland	2006	12.6	11.0
Havana, Cuba	2002	11.5	10.4
Istanbul, Turkey	2000	4.7	5.7
Johannesburg, South Africa	2001	4.1	4.6
London, United Kingdom	2001	12.4	15.9
Los Angeles, United States	2000	9.7	12.4
Manila, Philippines	2000	3.5	3.8
Montreal, Canada	2001	14.6	13.0
Nairobi, Kenya	1999	1.1	3.3
New York, United States	2000	11.7	12.4
Rio de Janeiro, Brazil	2000	9.1	5.9
San Jose, Costa Rica	2000	7.7	5.6
Shanghai, China	2000	11.7	7.1
Stockholm, Sweden	2006	14.3	17.4
Tokyo, Japan	2005	15.8	17.3
Tunis, Tunisia	2004	6.8	6.8

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

## OLDER PEOPLE MORE LIKELY THAN OTHERS TO LIVE IN RURAL AREAS

Urbanization is one of the most significant population trends of the last 50 years, and according to United Nations' estimates, the world will reach a milestone in 2008. For the first time in history, half of the global population is expected to live in urban areas (United Nations Economic and Social Council, 2008). Since urbanization is driven by youthful migration from rural areas to cities, it influences the age distribution in both sending and receiving areas. In general, rural areas have higher concentrations of older residents than do urban areas; this is primarily the result of the migration of

young adults to urban areas and, to a lesser extent, of return migration of older adults from urban areas back to rural homes. One study of data for 39 countries from the period 1989–1997 showed that the percentage of all older people living in rural areas was higher than the percentage of the total population in rural areas in 27 of the 39 nations, with no difference in 4 nations (Kinsella and Velkoff, 2001). Recent analyses of trends in Northern America indicate that rural populations will continue to be older than urban populations in the United States, while in Canada there is no clear correlation between urban or rural residence and concentrations of older people (Jones, Kandel, and Parker, 2007; and Malenfant et al., 2007).

## NO CLEAR TREND TOWARD DISPROPORTIONATE AGING OF LARGE CITIES

Although rural areas tend to be disproportionately older compared with urban areas in general, data for some large cities reveal a relatively high proportion of older residents. In countries where the youthful influx of rural-to-urban migrants slowed before 1990, many cities may have aging populations (Chesnais, 1991). Conversely, in countries where urbanization rates remain high and younger residents continue to gravitate toward cities, one would expect the proportion of older people in cities to be lower than for the country as a whole. Data for 20 major cities, however, do not indicate a clear pattern (Table 3-1). The populations of Budapest, Dublin, and Montreal are older than their respective national averages, but this is not the case in Copenhagen, London, Los Angeles, and Tokyo. Istanbul and Nairobi are younger than Turkey and Kenya as a whole, but a similar relationship does not hold in the Chinese cities of Beijing and Shanghai or in Calcutta or Rio de Janeiro. Despite the emergence of two major global demographic trends—population aging and urbanization—in recent decades, relatively little attention has been paid to the impact of these trends on the health and well-being of older people in cities (for more information, see the 2006 groundbreaking study by Victor Rodwin and Michael Gusmano, 2006).

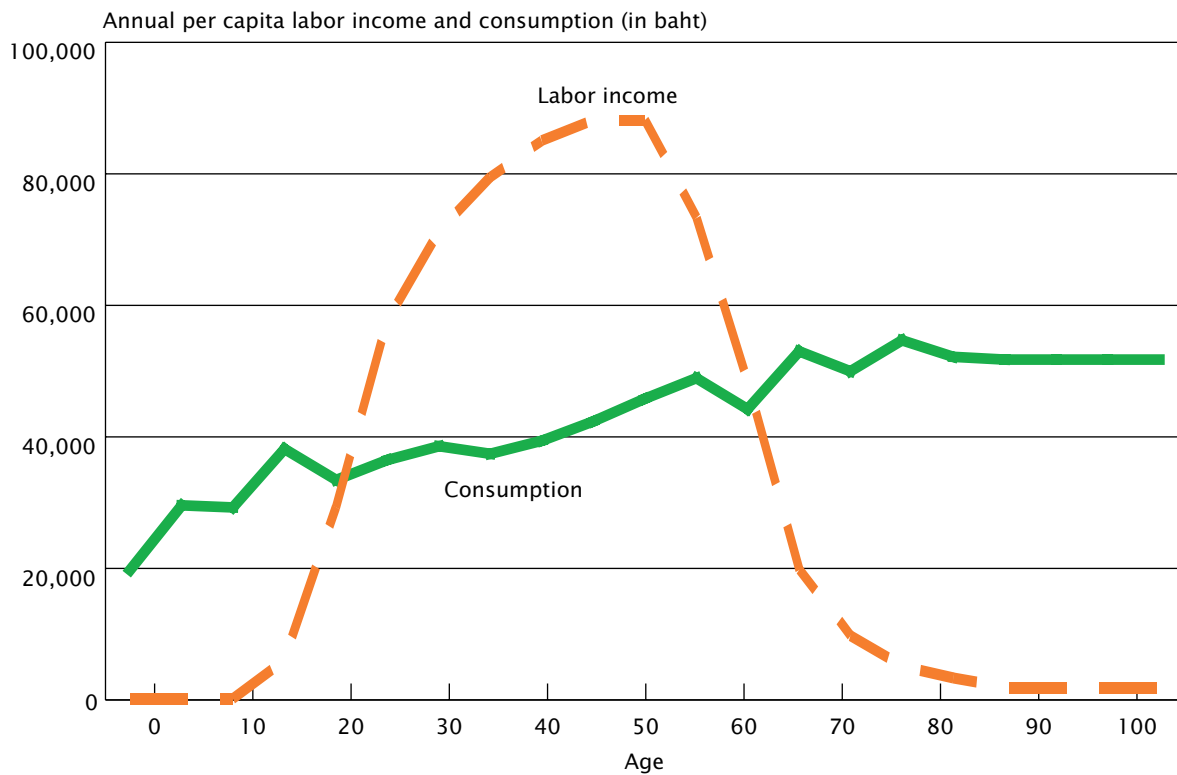
**Box 3-2.****Demographic Dividends**

An important aspect of changing population age structures is that virtually all countries have experienced, or are projected to experience, a large increase in the share of their population concentrated in the working ages. Other things being equal, this increase in the share of the working-aged population should have a positive effect on per capita income and government tax revenues, leading to what is labeled as the “first demographic dividend.” This first dividend lasts for decades in many countries; but as populations begin to age, the share of population in the working ages eventually declines, and the dividend becomes negative (Bloom, Canning, and Sevilla, 2003; and Mason, 2006).

A major economic challenge for aging societies is to provide for the needs of their older populations while potentially experiencing reduced labor income.

The prospect of rapid growth of the nonworking older population, with attendant strains on public pension and health care systems, has led to pessimism about future economic performance (Peterson 1999). However, rather than being an economic drain, population aging might give rise to a “second demographic dividend.” Societies rely on formal (public) and/or informal (largely familial) support systems to assist people in older age. Today, many countries are looking to increased savings rates and greater accumulated capital (wealth) as a response to population aging. If countries are successful in encouraging increased savings and wealth, this may constitute a second demographic dividend, i.e., the possibility for enhanced levels of investment and economic growth. Unlike the first demographic dividend, this second dividend is not necessarily transitory in nature. In theory, population aging may

Figure 3-8.  
**Economic Life Cycle of a Typical Thai Worker**



Source: Chawla, as reported in Lee and Mason, 2006.

Box 3-2.

**Demographic Dividends—Con.**

produce a permanent increase in capital and in per capita income.

Analysis of 228 countries and areas suggests that the duration of the first dividend was relatively short (30 to 35 years) in most industrial and transitional economies, considerably longer in much of Asia and Latin America, and likely to be longer still in Sub-Saharan Africa (Lee and Mason, 2006). Research now seeks to construct economic estimates of both the first and second dividends in order to contrast regional experiences. One interpretation is that the demographic dividends, if fully exploited, would have contributed between 1 and 2 percentage points to income growth during the period 1970–2000 for most regions of the world (Lee and Mason, 2006).

Demographic dividends are not automatic. Their full exploitation and impact depend on, to a large extent, the existence of strong institutions and policies that translate changes in population age structure into economic growth. For example, weaknesses in the governance and management of pension programs (e.g., significant tax evasion or unsustainable increases in public pension benefits) can offset many potential benefits of demographic dividends, as can persistent high levels of unemployment and underemployment. Thus, social context at least partially determines how the first and second demographic dividends differ throughout the world. In societies with a high prevalence of HIV/AIDS, the disease is eliminating a large portion of the first dividend, and there is reason to question whether a second dividend is possible. More generally, in societies

that have experienced an upswing in mortality rates (e.g., many transitional nations in Eastern Europe), excess adult mortality may undercut savings rates and hence undercut the second dividend. Social policy changes also could affect the magnitude of any demographic dividends. The elimination of mandatory retirement ages, for example, might be expected to increase the first dividend and perhaps the second dividend as well.

As of now, the second demographic dividend is still a theoretical construct. One analytical tool for estimating dividend levels and related effects is the life-cycle production-consumption function (Figure 3-8). By incorporating the age variable into national income and product accounts, researchers can generate life-cycle composites of consumption and production. They can then use these composites to generate more detailed national transfer accounts, which produce estimates of intergenerational reallocations (including savings patterns, spending on public programs, and family support systems for children and older people) (Mason et al., 2006). The next step will be to construct complementary time series of the age profiles of production, consumption, and lifecycle deficit, and to examine how these are influenced by social, economic, and demographic factors. Other researchers (Manton et al., 2007) are looking at the aging of labor forces and changes in disability rates, considering how to increase health and human capital at later ages in order to stimulate increases in gross domestic product (GDP) and enhance a potential second demographic dividend.



## Life Expectancy and Mortality

One of gerontology's liveliest and most enduring debates centers around the trajectory of human survival. Is average life expectancy likely to peak around age 85 or 90, as some have argued, or will new ways be found to sustain the large increase in life expectancy that began in the mid-1800s and has continued to unfold during the ensuing 150 years? While some have ascribed the historical increase primarily to improvements in medicine and public health, others have pointed out that the major impact of improvements both in medicine and sanitation did not occur until the late nineteenth century (Thomlinson, 1976; and Moore, 1993). Earlier important

factors in lowering mortality were innovations in industrial and agricultural production and distribution, which improved nutrition for large numbers of people. Today's research consensus attributes the gain in human longevity since the early 1800s to a complex interplay of advancements in medicine and sanitation coupled with new modes of familial, social, economic, and political organization (Riley, 2001).

### **LIFE EXPECTANCY AT BIRTH EXCEEDS 80 YEARS IN 11 COUNTRIES**

Life expectancy at birth in Japan and Singapore has reached 82 years, the highest level of all the world's major countries, and

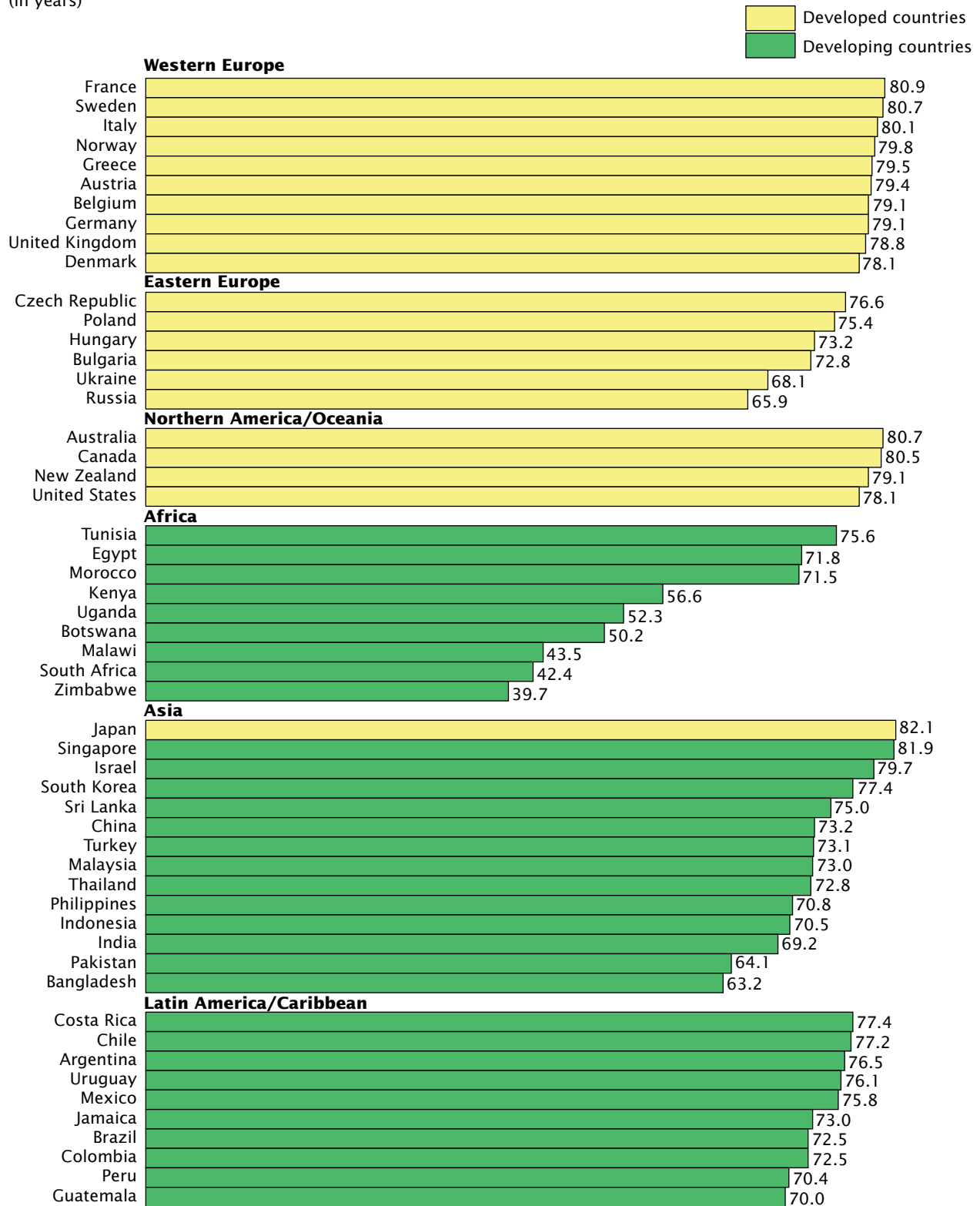
has reached at least 80 years in numerous other nations. Levels for the United States and most other developed countries fall in the 78–80 year range (Figure 4-1). Throughout the developing world, there are extreme variations in life expectancy at birth (Figure 4-2). While the levels in some developing nations match or exceed those in many European nations, the average lifetime in 25 African countries spans fewer than 50 years. On average, an individual born in a developed country can now expect to outlive his or her counterpart in the developing world by 14 years.



Figure 4-1.

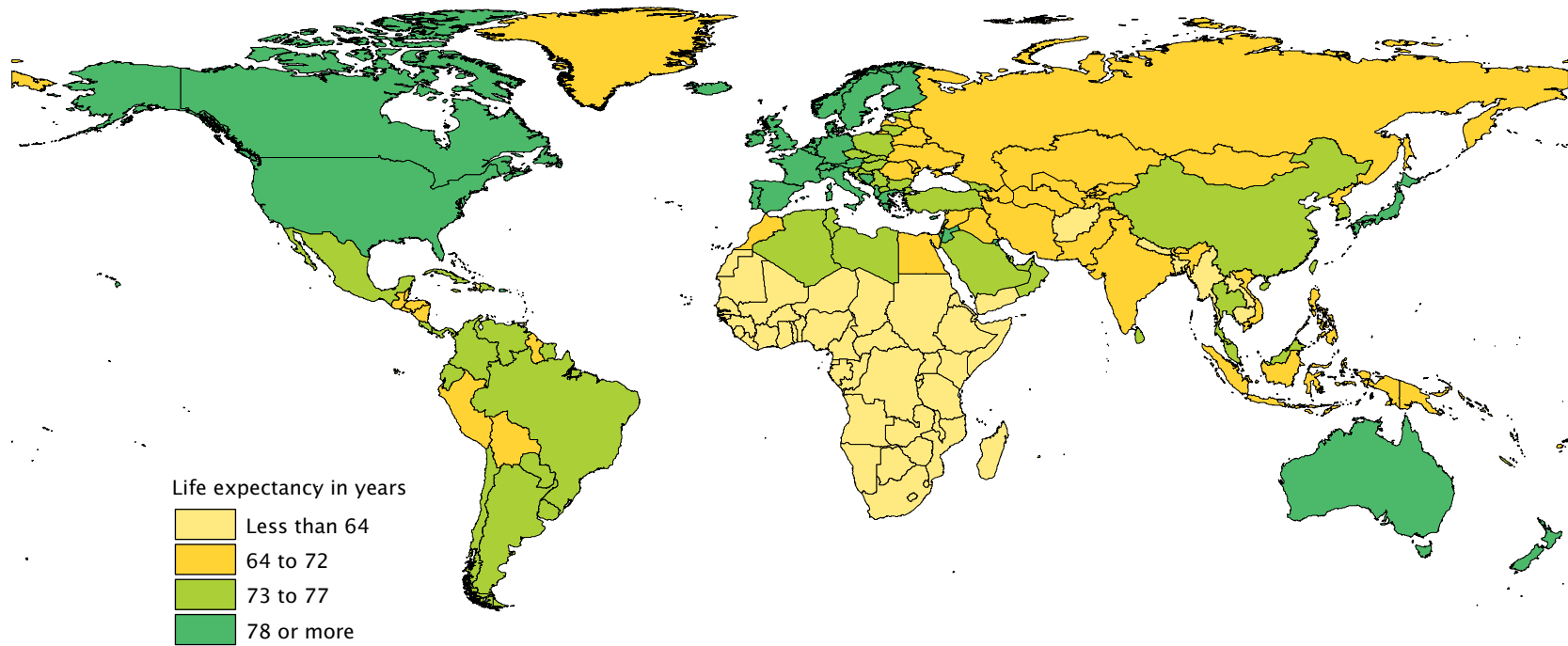
# **Life Expectancy at Birth for Selected Countries by Region: 2008**

(In years)



Source: U.S. Census Bureau, International Data Base, accessed on February 29, 2008.

Figure 4-2.  
**Life Expectancy at Birth: 2008**



Source: U.S. Census Bureau, International Data Base, accessed on May 27, 2008.

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## **TWENTIETH CENTURY LIFE EXPECTANCY DOUBLED IN SOME DEVELOPED COUNTRIES**

Table 4-1 shows the enormous strides that countries have made in extending life expectancy since 1900. In some countries (e.g., Austria, Greece, and Spain), life expectancy more than doubled during the twentieth century. Increases in life expectancy were more rapid in the first half than in the second half of the century. Expansion of public health services and facilities and disease eradication programs greatly reduced death rates, particularly among infants and children. From 1900 to 1950, people in many Western nations were able to add 20 years or more to their life expectancies.

Reliable estimates of life expectancy for most developing countries prior to 1950 are unavailable. Since World War II, changes in life expectancy in developing regions of the world have been fairly uniform. 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 HIV/AIDS. The most dramatic gains in the developing world have been in eastern Asia, where aggregate life expectancy at birth increased from less than 45 years in 1950 to more than 73 years today (United Nations Department of Economic and Social Affairs, 2007b).

## **RISING LIFE EXPECTANCY AT BIRTH IS NOT UNIVERSAL**

While global gains in life expectancy at birth have been the norm, unforeseen changes and epidemics may reverse the historical pattern. Beginning in the 1950s, the typical sustained increase in life expectancy at birth in developed

countries began to take different paths. While female life expectancy continued to rise virtually everywhere, male gains slowed 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. After this period, male life expectancy again began to rise.

In much of Eastern Europe and the former Soviet Union, the pace of improvement in the 1950s and early 1960s was extraordinary. Advances in living conditions and public health policies combined to produce large declines in mortality by reducing some major causes of death (e.g., tuberculosis) to minimal levels (Vishnevsky, Shkolnikov, and Vassin, 1991). Resultant gains in life expectancy in excess of 5 years per decade were common. By the mid-1960s, however, the rate of increase had decelerated sharply. In the 1970s and 1980s, changes in female life expectancy at birth were erratic, while male life expectancy fell throughout the region (Bobadilla and Costello, 1997).

Following the demise of the Soviet Union, the decline in male life expectancy at birth continued in some countries. The decline has been particularly severe for Russian men; between 1987 and 1994, male life expectancy at birth fell 7.3 years to a level of 57.6 years. After rising during the mid-1990s, male life expectancy again declined in Russia (Figure 4-3). Much of this decline has been attributed to increases in adult male mortality due to a combination of factors (Virganskaya and Dmitriev, 1992; and Murray and Bobadilla, 1997). One analysis (Brainerd and Cutler, 2005) identified six possible culprits: the breakdown of the medical care system; an increase in traditional risk factors

for cardiovascular disease (smoking, hypertension, obesity, etc.); increased alcohol consumption; changes in dietary composition; material deprivation (as reflected by wages, poverty, and weakened social safety nets); and increased psychosocial problems (stress, negative future expectations, and suicide). The study looked at national and international data on cause-specific mortality rates, medical spending, and socioeconomic indicators in combination with data from the Russian Longitudinal Monitoring Survey. Of the six factors just mentioned, two stood out: alcohol consumption and “psychosocial stress,” each explaining about 25 percent of the deterioration in mortality. The other four factors found little support in the data, and the large unexplained residual underscores that clear causal mechanisms remain poorly understood.

In some countries, particularly in parts of Africa, the HIV/AIDS pandemic has had a devastating effect on life expectancy (see Box 4-1). The impact on national life expectancy at birth can be considerable, given that HIV/AIDS deaths often are concentrated in the childhood and mid-adult ages. Estimates for the year 2006 suggest that HIV/AIDS has reduced female life expectancy at birth by more than 28 years from otherwise projected levels in Botswana, Lesotho, Namibia, South Africa, Swaziland, and Zimbabwe (Velkoff and Kowal, 2007). While the common perception of HIV/AIDS mortality usually associates HIV/AIDS deaths with younger adults, the pandemic also has a direct and growing effect on older populations. In the United States in 2005, more than twice as many people aged 60 and over died of HIV/AIDS as did people under age 30 (Centers for Disease Control and Prevention, 2007).

Table 4-1.

**Life Expectancy at Birth for Selected Countries by Sex: 1900, 1950, and 2008**

(In years)

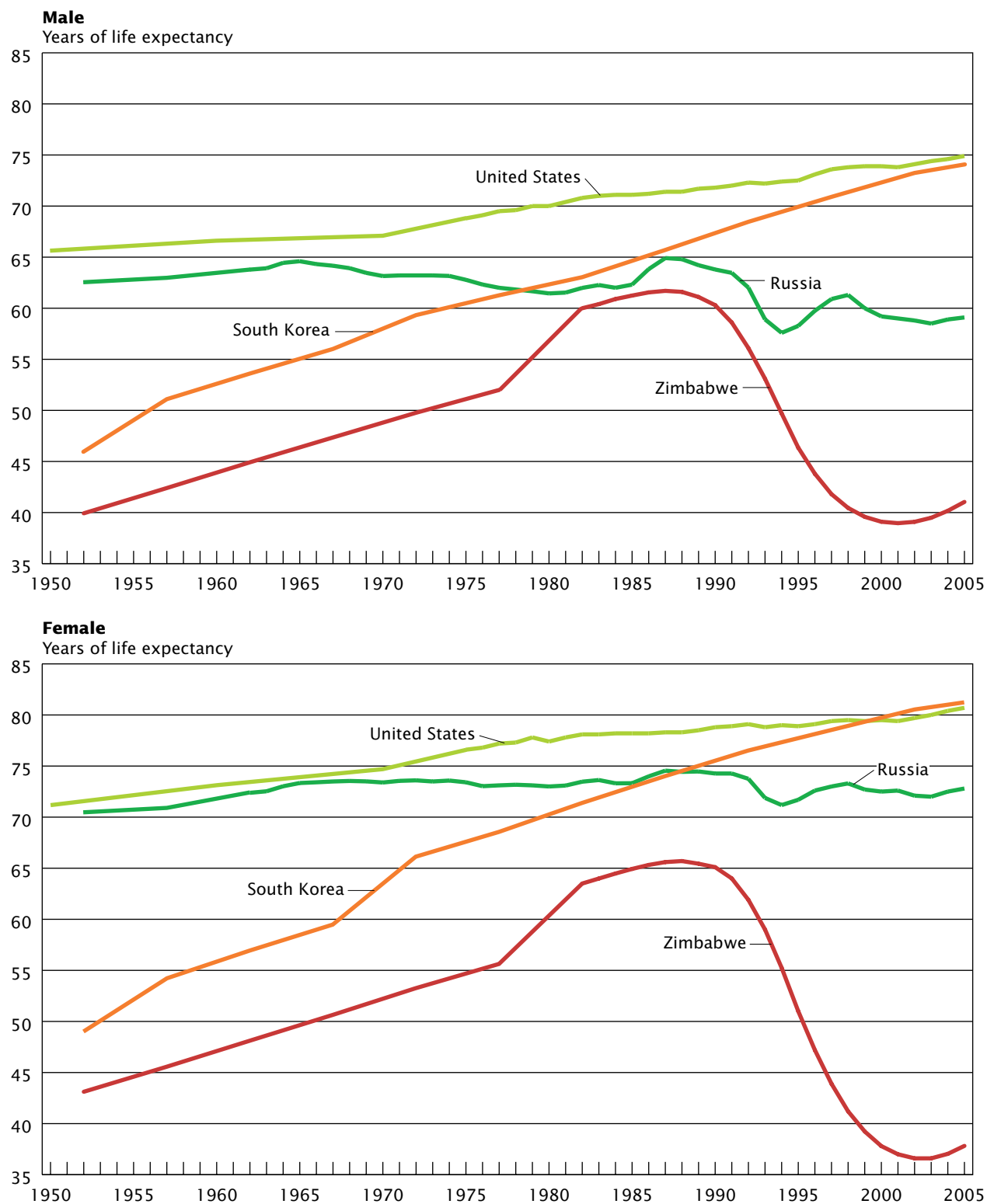
Region/country	Circa 1900		Circa 1950		2008	
	Male	Female	Male	Female	Male	Female
<b>Europe</b>						
Austria .....	37.8	39.9	63.2	68.4	76.5	82.4
Belgium .....	45.4	48.9	65.9	70.9	75.9	82.4
Czech Republic <sup>1</sup> .....	38.9	41.7	64.5	69.5	73.3	80.1
Denmark .....	51.6	54.8	69.6	72.4	75.8	80.6
France .....	45.3	48.7	63.7	69.5	77.7	84.2
Germany <sup>1</sup> .....	43.8	46.6	65.3	69.6	76.1	82.3
Greece .....	38.1	39.7	64.3	67.5	77.0	82.2
Hungary .....	36.6	38.2	61.5	65.8	69.0	77.6
Italy .....	42.9	43.2	64.3	67.8	77.1	83.2
Norway .....	52.3	55.8	70.9	74.5	77.2	82.6
Spain .....	33.9	35.7	61.6	66.3	76.6	83.5
Sweden .....	52.8	55.3	70.4	73.3	78.5	83.1
United Kingdom .....	46.4	50.1	66.7	71.8	76.4	81.5
<b>Other Developed Countries</b>						
Australia .....	53.2	56.8	66.9	72.4	77.9	83.8
Japan .....	42.8	44.3	61.6	65.5	78.7	85.6
United States .....	48.3	51.1	66.1	72.0	75.3	81.1
<b>Africa</b>						
Egypt .....	(NA)	(NA)	41.1	42.7	69.3	74.5
Kenya .....	(NA)	(NA)	40.5	44.2	56.4	56.9
Malawi .....	(NA)	(NA)	35.8	36.7	43.7	43.1
South Africa .....	(NA)	(NA)	44.0	46.0	43.3	41.4
Uganda .....	(NA)	(NA)	38.5	41.6	51.3	53.4
Zimbabwe .....	(NA)	(NA)	47.0	50.0	40.9	38.5
<b>Asia</b>						
Bangladesh .....	(NA)	(NA)	38.3	36.7	63.1	63.3
China .....	(NA)	(NA)	39.3	42.3	71.4	75.2
India .....	(NA)	(NA)	38.1	36.6	66.9	71.9
South Korea .....	(NA)	(NA)	46.0	49.0	74.0	81.1
Thailand .....	(NA)	(NA)	49.2	52.6	70.5	75.3
Turkey .....	(NA)	(NA)	42.0	45.2	70.7	75.7
<b>Latin America</b>						
Argentina .....	(NA)	(NA)	60.4	65.1	72.8	80.4
Brazil .....	(NA)	(NA)	49.3	52.7	68.6	76.6
Chile .....	(NA)	(NA)	52.9	56.8	73.9	80.6
Costa Rica .....	(NA)	(NA)	56.0	58.6	74.8	80.1
Mexico .....	(NA)	(NA)	48.9	52.5	73.0	78.8
Uruguay .....	(NA)	(NA)	63.3	69.4	72.9	79.5

(NA) Reliable estimates for 1900 for most developing countries are not available.

<sup>1</sup> Figures for Germany and Czech Republic prior to 1999 refer to the former West Germany and Czechoslovakia, respectively.

Sources: Siempos, 1990; United Nations, Department of Economic and Social Affairs, 2007b; and U.S. Census Bureau, International Data Base, accessed on November 9, 2007.

Figure 4-3.  
**Life Expectancy at Birth for Four Countries by Sex: 1950 to 2005**



Sources: United Nations Department of Economic and Social Affairs, 2007b; and U.S. Census Bureau, International Data Base, accessed on January 4, 2007.

Box 4-1.

## Demographic Impact of HIV/AIDS

The HIV/AIDS pandemic is having a direct impact on the age and sex structure of many countries, particularly in Sub-Saharan Africa. To evaluate this impact, national and international organizations now calculate mortality rates and life expectancies with and without HIV/AIDS-related mortality. Life expectancy without HIV/AIDS-related mortality is an estimate of what life expectancy would be if a given nation had not experienced an HIV/AIDS epidemic. In Botswana, for example, the U.S. Census Bureau estimates that male and female life expectancies

at birth in 2006 were 22 years and 28 years lower, respectively, than they would have been without mortality due to HIV/AIDS.

For countries affected severely by HIV/AIDS, the impact is clearly seen in the age and sex structure of the population. Figure 4-4 uses population pyramids to illustrate the population structure with and without HIV/AIDS as estimated for Botswana in 2006 and projected to 2030. The population in 2006 was smaller than it would have been without HIV/AIDS mortality, but the age structure still had the

classic shape of a young population—wide at the bottom and narrow at the top. By 2030, the effect of HIV/AIDS on Botswana's population structure is likely to be more pronounced. The pyramid has lost the classic young-population shape, and the numbers of people in each age group are much smaller than they would have been in the absence of HIV/AIDS mortality. These projections indicate that by 2030, HIV/AIDS will reduce the size of the 60-and-over population by 45 percent from its expected level without HIV/AIDS mortality.

Figure 4-4.

### Population With and Without HIV/AIDS-Related Mortality in Botswana by Age and Sex: 2006 and 2030

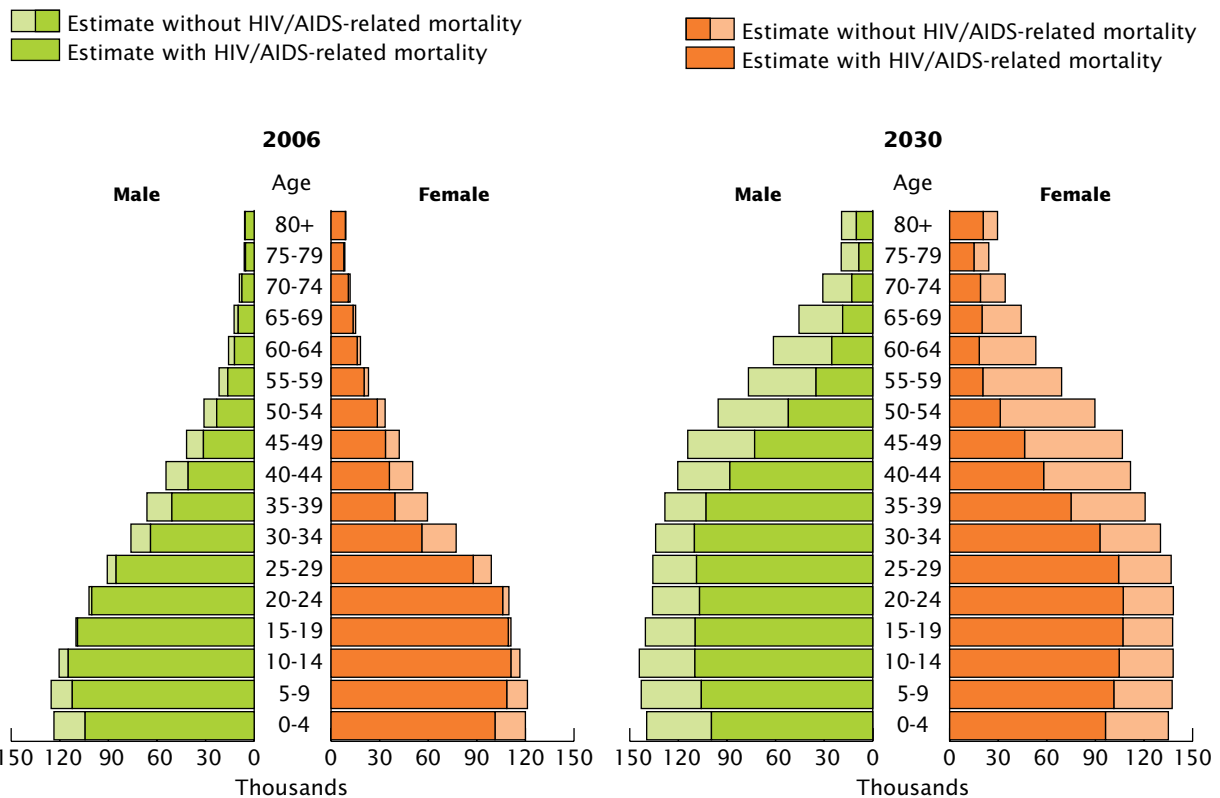
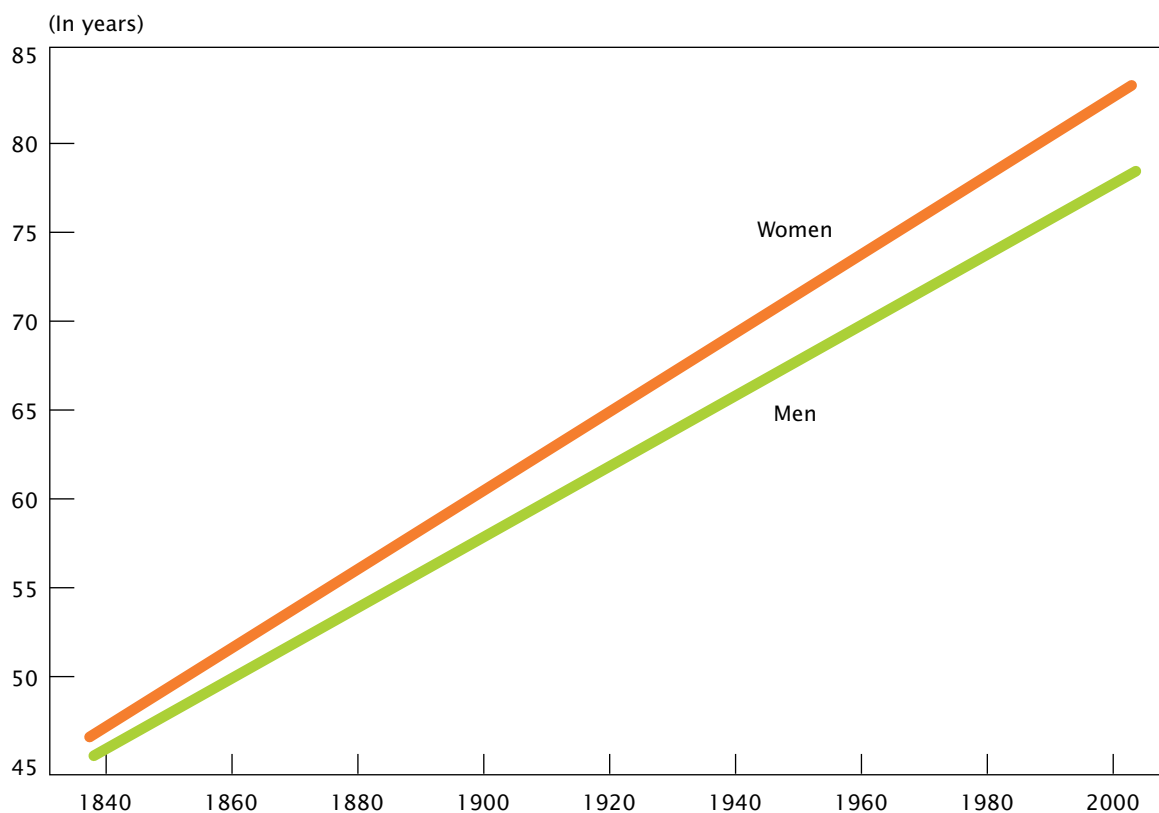


Figure 4-5.  
**Highest National Life Expectancy at Birth: 1840 to 2000**



Note: This figure shows linear-regression trends for annual male and female life expectancies at birth from 1840 through 2000.  
Source: Adapted from Oeppen and Vaupel, 2002.

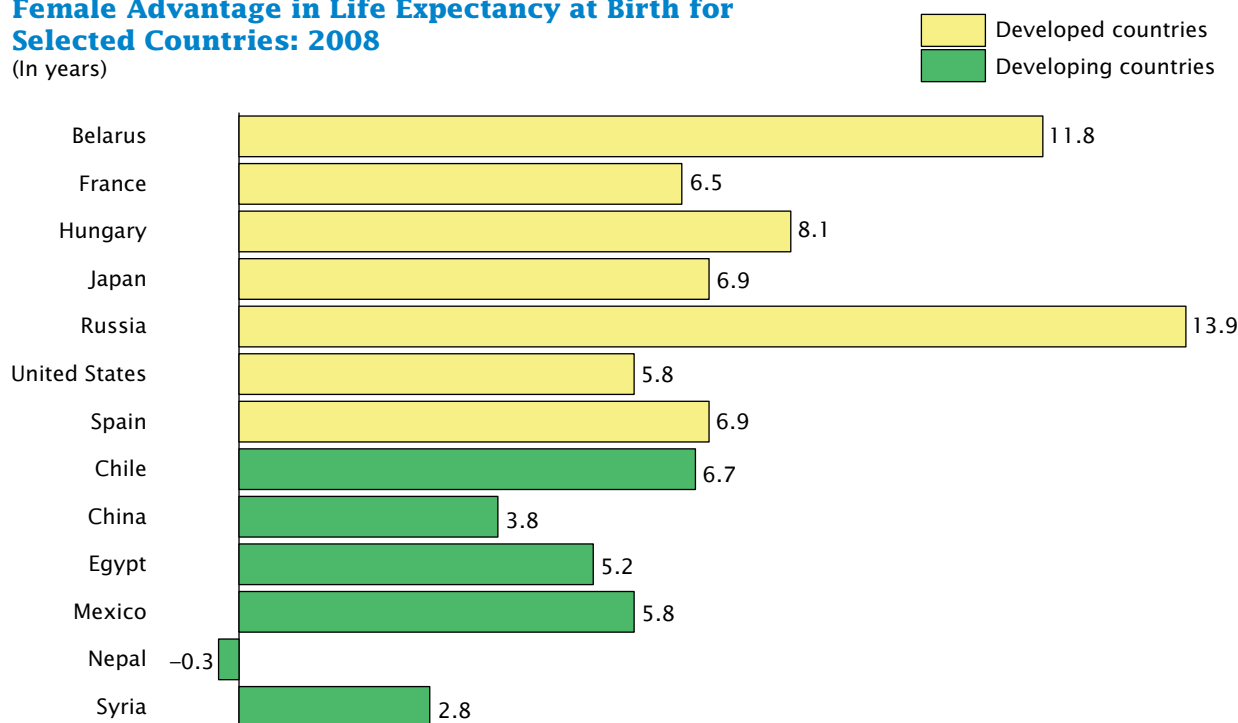
### HIGHEST RECORDED AVERAGE LIFE EXPECTANCY CONTINUES TO RISE

A compilation of the highest recorded national female life expectancies over the period 1840–2000 showed a steady increase of 3 months per year (Oeppen and Vaupel, 2002). The country with the highest average life expectancy has varied over time—in 1840 it was Sweden, and recently

it is Japan—but the linearity of the pattern is remarkable (Figure 4-5). Record life expectancy for males also has shown a linear increase, though the slope of the increase is steeper for females. From a historical perspective, the apparent leveling off of life expectancy in some countries is part of a process whereby those lagging behind periodically catch up and those leading fall behind. The long-term view

implies that reductions in mortality are not a sequence of disconnected revolutions but a continuous stream of progress. Oeppen and Vaupel (2002) note that if the 160-year trend continued, people in the country with the highest life expectancy would live to an average of 100 years in approximately six decades' time.

Figure 4-6.  
**Female Advantage in Life Expectancy at Birth for  
 Selected Countries: 2008**  
 (In years)



Source: U.S. Census Bureau, International Data Base, accessed on October 8, 2007.

## FEMALE ADVANTAGE IN LIFE EXPECTANCY AT BIRTH NEARLY UNIVERSAL

The widening of the sex differential in life expectancy was a central feature of mortality trends in developed countries throughout much of the twentieth century, although the differential has narrowed in some countries in the last two to three decades. In 1900, women in Europe and Northern America typically outlived men by 2 or 3 years. Today, the average gap between the sexes is roughly 7 years and exceeds 12 years in parts of the former Soviet Union as a result of the unusually high levels of male mortality discussed above (Figure 4-6). This differential reflects the fact that in most nations, females have lower mortality than males in every age group and for most causes of death. Female life expectancy now

exceeds 80 years in more than 45 countries and is approaching this level in many other nations. The gender differential usually is smaller in developing countries, commonly in the 3- to 6-year range, and may be reversed in some southern Asian and Sub-Saharan African societies where cultural factors (such as low female social status and a stronger preference for male offspring) and/or the differential impact of the HIV/AIDS pandemic contribute to higher male than female life expectancy at birth.

## FEMALE MORTALITY ADVANTAGE PERSISTS IN OLDER AGE

Age-specific female mortality rates typically are lower than the corresponding male rates in childhood and the working ages, and this female advantage continues into

older age. Figure 4-7 illustrates the usual gender pattern of mortality at older ages, wherein male rates are consistently higher than female rates. In Hong Kong and Israel, for instance, male mortality rates for ages 65 to 69 are roughly twice as large as corresponding female rates.

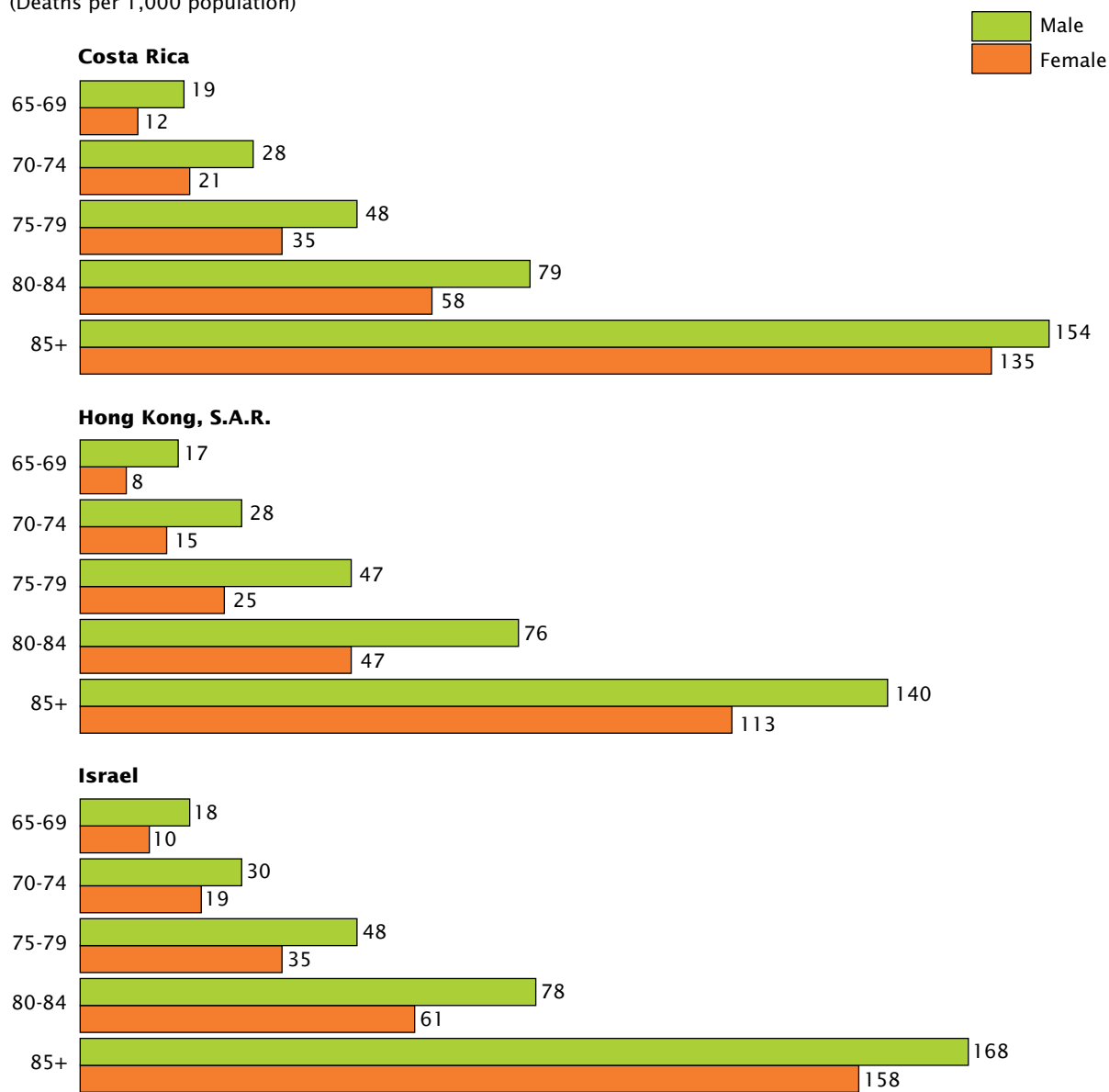
Simple explanations of the gender difference in life expectancy still elude scientists because of the apparent complex interplay of biological, social, and behavioral conditions. Greater use of tobacco and alcohol and higher exposure to occupational hazards have been cited as a source of higher male mortality rates (Trovato, 2005; and Gee, 2002), suggesting that the gap in life expectancy might decrease if women increased their use of tobacco and alcohol and their participation in the labor force. Data from industrialized countries



Figure 4-7.

### Mortality Rates at Older Ages for Three Countries by Sex: 2004

(Deaths per 1,000 population)



Source: United Nations Department of Economic and Social Affairs, *Demographic Yearbook 2004*.

tend to show a narrowing of the gender gap in the last two decades, although the gap has widened in parts of Eastern Europe and the former Soviet Union.

We might expect to see a widening of the gender gap in life expectancy in developing countries in upcoming decades, along the lines of the historical trend in industrialized nations. Evidence suggests

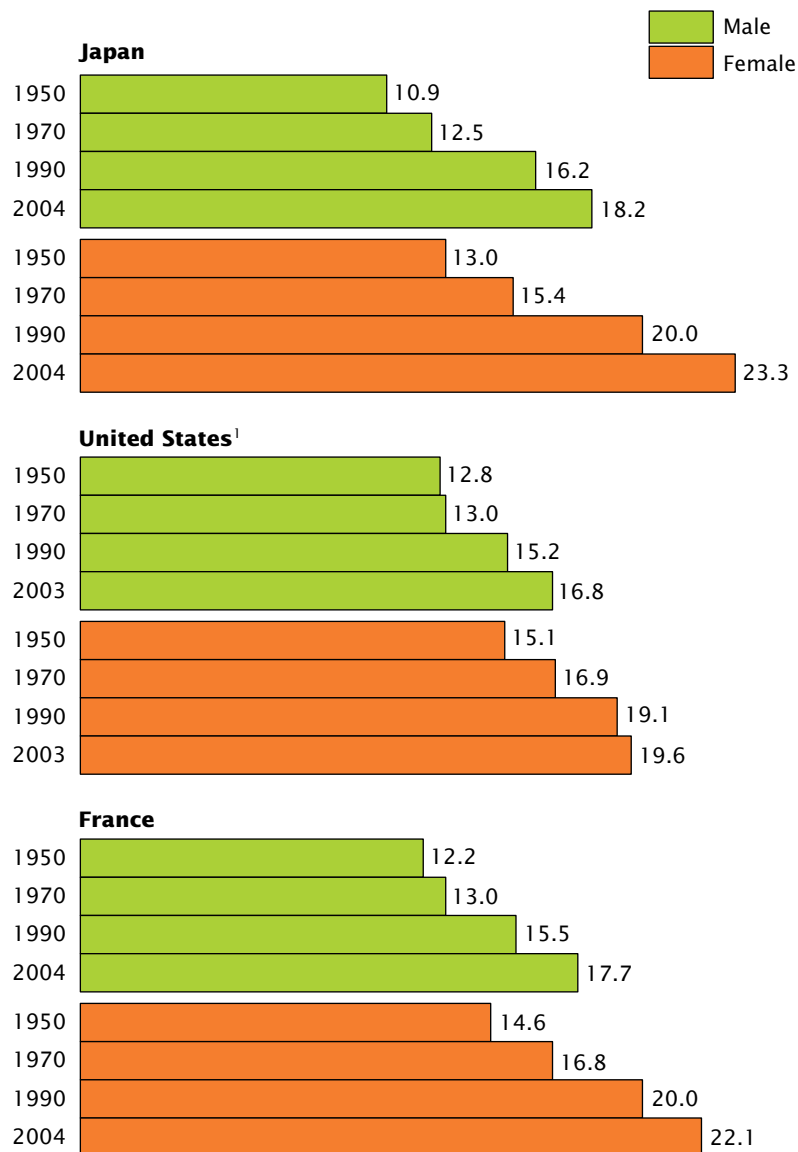
that many developing countries are experiencing increases in alcohol and tobacco consumption and vehicular as well as industrial accidents, all of which tend, at least initially, to adversely affect men more than women. The United Nations has set a major decrease in maternal mortality levels as one of its Millennium Development Goals, and the gender gap in life

expectancy should increase if this goal is approached (United Nations, 2008). Another factor that may promote a widening gender gap is education, which is positively related to survival. As women “catch up” to men in terms of educational attainment, female survival and health status may improve (Knodel, Ofstedal, and Hermalin, 2002).

Figure 4-8.

### Evolution of Life Expectancy at Age 65 in Japan, the United States, and France by Sex: 1950 to 2004

(In years)



<sup>1</sup> Latest U.S. data refer to 2003.

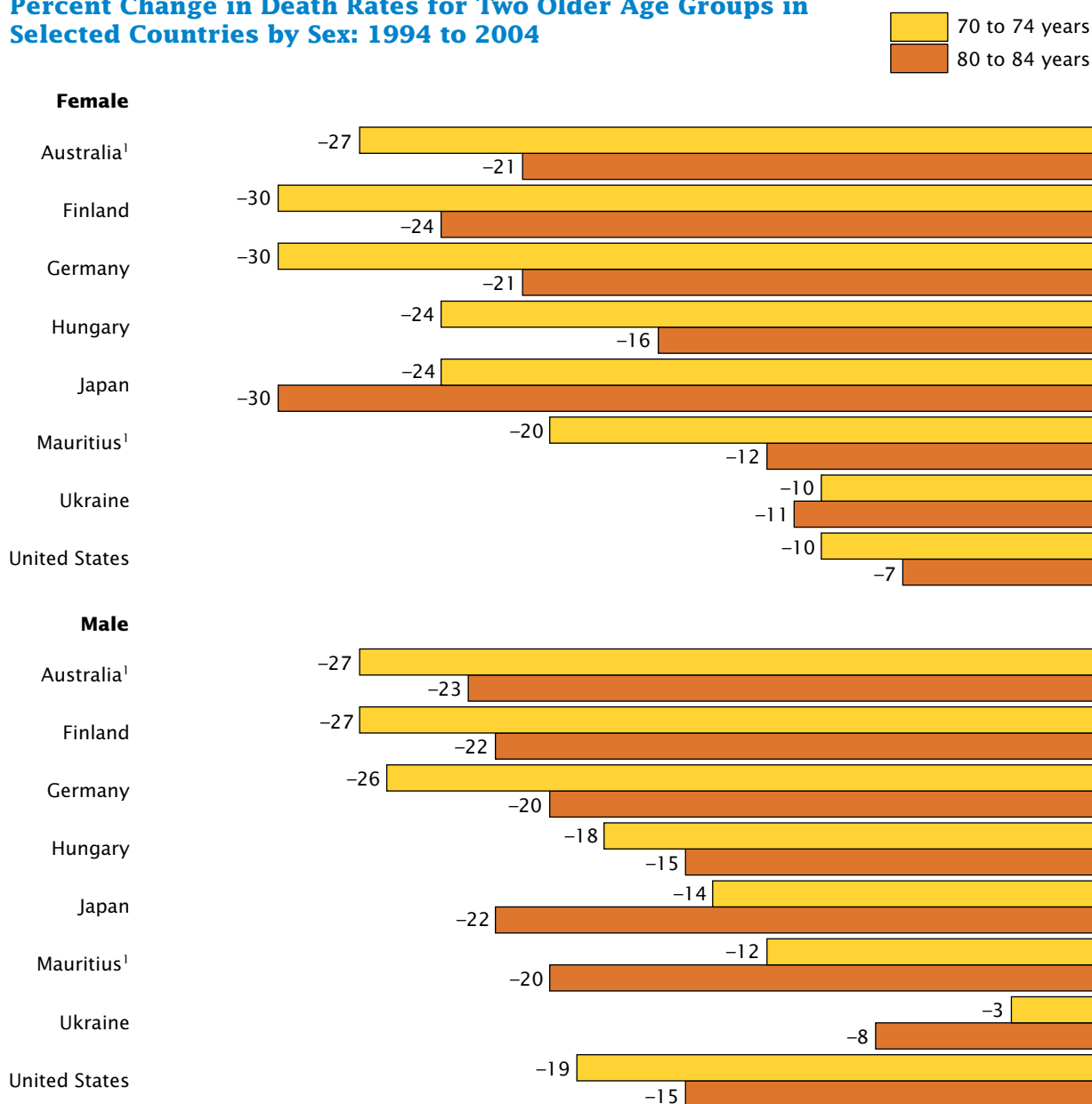
Source: University of California, Berkeley; and Max Planck Institute for Demographic Research, Human Mortality Database, accessed on November 7, 2007.

### OLD-AGE MORTALITY RATES DECLINING OVER TIME

In countries where infant and childhood mortality rates are still relatively high, most of the improvement in life expectancy at birth results from helping infants survive the high-risk initial years of life. But when a nation's infant and childhood mortality reach low levels, longevity gains in older segments of the population account for a greater share of the overall improvement in life expectancy (Gjonca, Brockmann, and Maier, 2000; and Mesle and Vallin, 2006). Many countries are experiencing a rise in life expectancy at age 65, as exemplified by the data for three countries in Figure 4-8. The average Japanese woman reaching age 65 in 2004 could expect to live an additional 23.3 years and the average man more than 18 years. Life expectancy for Japanese women at age 65 increased 52 percent between 1970 and 2004, compared with an increase in life expectancy at birth of 15 percent. A longer-term investigation of change in Britain discovered that while life expectancy at age 65 increased 1 year between 1840 and 1960, it has increased by 1 year in each of the decades since 1960 (Stewart and Vaitlingam, 2004). Figure 4-9 shows across-the-board declines in mortality in two older age groups during a fairly recent 10-year period. In general, mortality improvements for people aged 70 to 74 have been larger than for people aged 80 to 84.

Figure 4-9.

**Percent Change in Death Rates for Two Older Age Groups in Selected Countries by Sex: 1994 to 2004**



<sup>1</sup> Data for Australia and Mauritius are for 1993 and 2003.

Source: United Nations Department of Economic and Social Affairs, *Demographic Yearbook 1996 and 2004*.

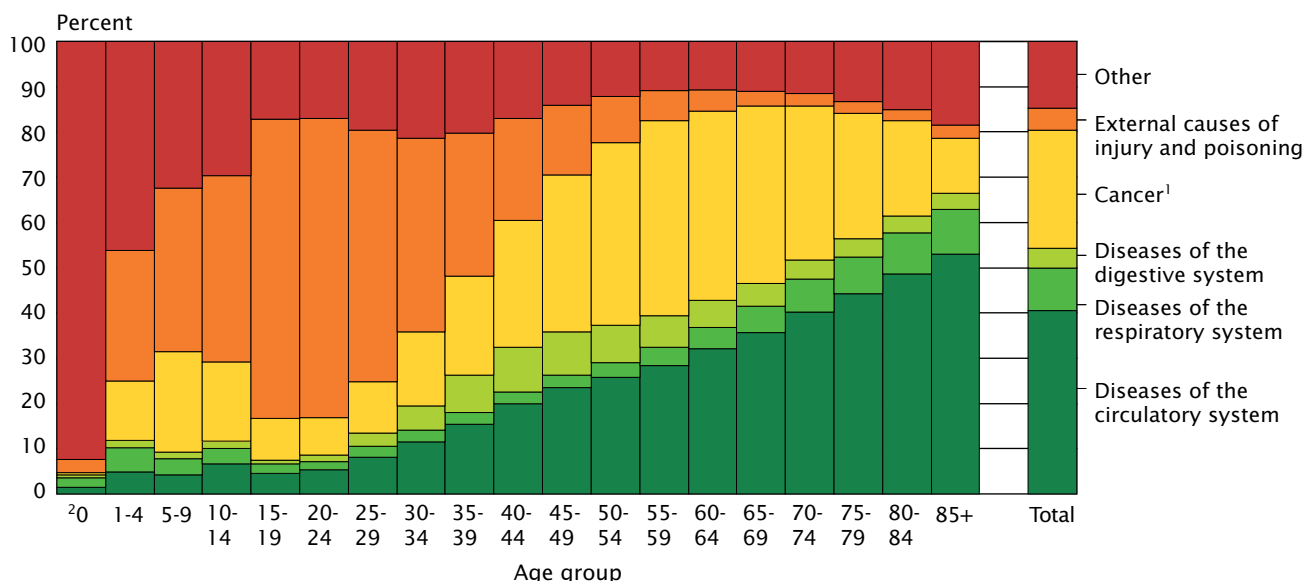
The pace at which death rates at advanced ages decline will affect future numbers of the older and especially of the very old population. One study in England and Wales (Vaupel, 1998) found that

the life expectancy of 80-year-old women was about 50 percent higher in the mid-1990s than in 1950. Consequently, the number of female octogenarians was about 50 percent higher than it would have been had oldest-old mortality

remained at 1950 levels. In absolute terms, more than one-half million oldest-old British women were alive in the mid-1990s than would have been without mortality improvement.

Figure 4-10.

### Major Causes of Death in the European Union by Age: 2001



<sup>1</sup> Cancer refers to malignant neoplasms including leukemias and lymphomas.

<sup>2</sup> In the age group 0 (less than 1 year), the principal causes of death were "certain conditions originating in the perinatal period" (48 percent) and "congenital malformations and chromosomal abnormalities" (28 percent), which are included in "Other."

Note: Data refer to 25 European Union countries.

Source: Adapted from European Commission, 2007, based on Eurostat mortality statistics.

### CARDIOVASCULAR DISEASE THE PREEMINENT CAUSE OF DEATH AMONG OLDER PEOPLE

Summary mortality indexes, such as life expectancy, are useful for broad comparative purposes but may mask changes in mortality by age and/or cause of death. Analysis of cause-specific changes in mortality can help professionals devise medical or nutritional interventions to affect overall longevity and the quality of years lived at older ages.

Death rates due to cardiovascular diseases (CVDs)—a broad category that includes heart,

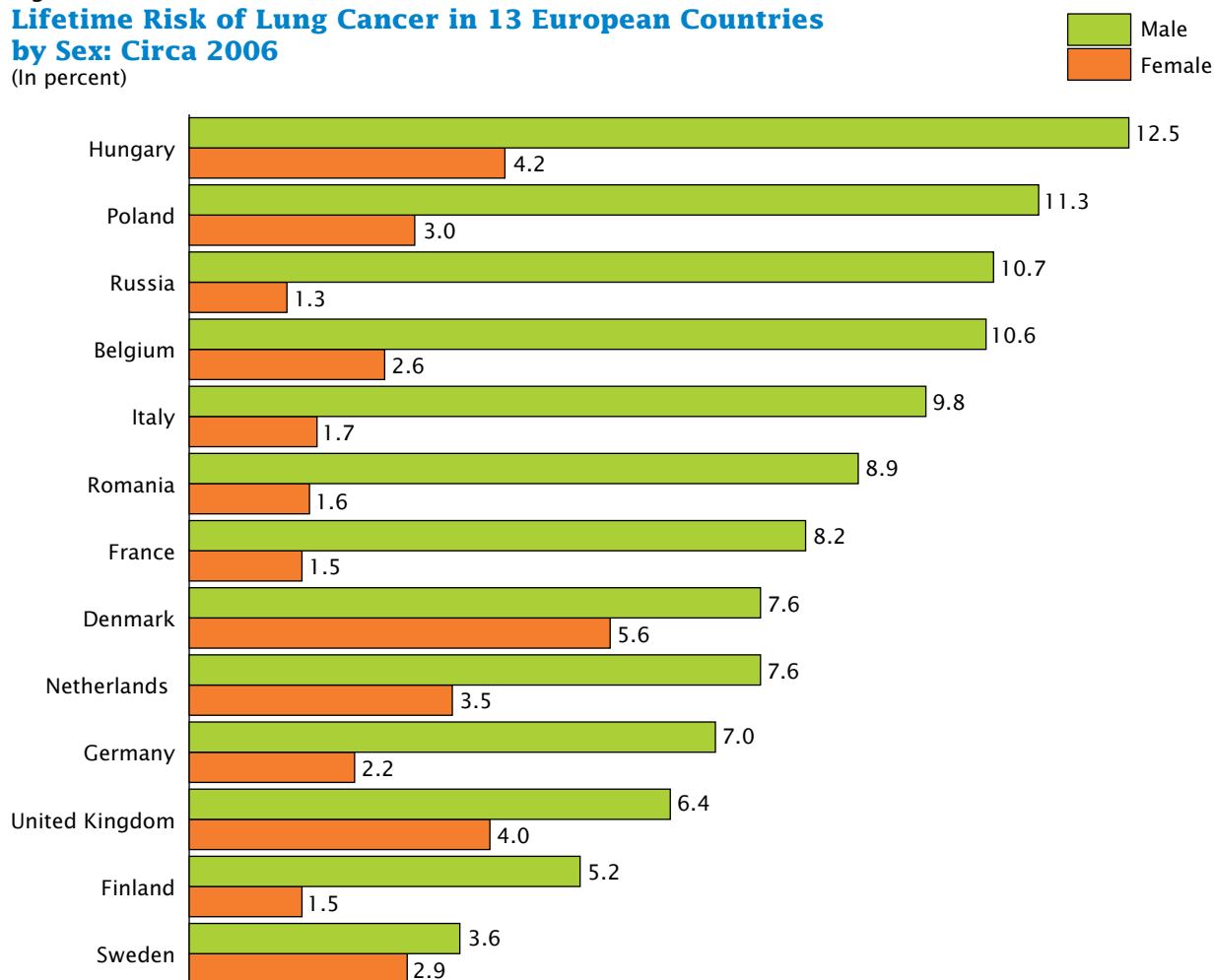
cerebrovascular (stroke), and hypertensive diseases—increase with age. One comprehensive analysis of developed nations (Murray and Lopez, 1996) attributed nearly 60 percent of all deaths to women aged 60 and over in the early 1990s to CVDs; the corresponding figure for older men was 50 percent. In recent years, death rates due to CVDs have declined at older ages in many developed countries. Nevertheless, CVDs remain the primary killer among older populations (European Commission, 2007). Figure 4-10 shows the proportions of all deaths attributed to major disease categories for the

aggregate 25-country European Union in 2001. While CVDs may be considered "diseases of affluence," their prominence is not limited to developed countries. CVDs have become the leading cause of death in all developing regions of the world, except for Sub-Saharan Africa (Mathers et al., 2005). In developing countries as a whole, CVDs cause twice as many deaths as HIV/AIDS, tuberculosis, and malaria combined (Lopez et al., 2006; and Gaziano, 2007). Chapter 5 discusses in more detail the growing impact of CVDs in developing countries.

Figure 4-11.

### Lifetime Risk of Lung Cancer in 13 European Countries by Sex: Circa 2006

(In percent)



Note: Data refer to cumulative lifetime risk during the ages 0 to 74.

Source: Adapted from Ferlay et al., 2007.

### PERSISTENT CONCERN ABOUT LUNG CANCER

Although deaths from CVDs are expected to remain most prominent in the future (see Sonnenschein and Brody [2005] for projections of proportionate mortality in the United States), a major concern of health practitioners in the industrialized world is the rise in lung cancer among older women as a result of increased tobacco use since World War II. Estimates for the early 1990s (Murray and Lopez, 1996) suggested that lung cancer was responsible for 30 percent of

all cancer deaths to males in developed countries and 12 percent of all cancer deaths to females. Proportions for the 60-and-over population were virtually identical. More recent data show that male death rates from lung cancer appear to have peaked and are now falling in some countries and stabilizing in many others, perhaps portending future declines. Conversely, female death rates from lung cancer have been rising rapidly since 1950, in proportion to the large increases in cigarette consumption that began several decades ago. By 2001, lung cancer

had become the third leading cause of death overall in developed countries (Lopez et al., 2006). In the United States, male death rates from lung cancer (including cancer of the trachea and bronchus) peaked around 1990, while female death rates rose during the period 1950–2003 (National Center for Health Statistics, 2006). Lung cancer remains the preeminent cause of cancer death in Europe (Ferlay et al., 2007). In some countries, the estimated lifetime risk for men having lung cancer exceeds 10 percent (Figure 4-11).

Box 4-2.

### Suicide Rates Much Higher Among Older Men Than Women

Suicide rates in 30 countries with relatively reliable data (Table 4-2) are consistently higher among men than women in all age groups, including ages 65 and over. This gender difference is seen in societies as disparate as Singapore, Cuba, Israel, and Bulgaria. Suicide rates are most likely to increase with age among men and are highest at ages 75 and over in two-thirds of the countries shown in Table 4-2. Suicide rates for women also tend to rise with age, although peak rates for women occur before age 75 in about half of the countries shown. The gender difference may be surprising in view of two considerations: (1) the average woman outlives her spouse, and many studies have shown that married elders

are happier than nonmarried elders (see Chapter 6); and (2) older women have higher rates of disability than do older men (see Chapter 5). These factors suggest that older women would have higher rates of suicide than older men, but this is not the case.

Among the 30 countries examined, South Korea and Hungary had the highest suicide rates for both older men and women. The reported rate for South Korean men aged 75 and over is nearly four times higher than the rate in Japan and 20 times higher than that in Ireland. Cuba, Hong Kong, Kazakhstan, Russia, and Ukraine have comparatively high rates among their 65-and-over male populations, while Hong

Table 4-2.  
**Suicide Rates for Selected Age Groups in 30 Countries: Circa 2004**

(Deaths per 100,000 population)

Country	Year	Male				Female			
		15 to 24 years	45 to 54 years	65 to 74 years	75 years and over	15 to 24 years	45 to 54 years	65 to 74 years	75 years and over
Europe									
Bulgaria . . . . .	2004	7	25	29	69	2	9	16	18
Denmark . . . . .	2001	13	28	25	59	2	10	17	20
Finland . . . . .	2004	33	43	44	40	10	18	9	8
France . . . . .	2003	13	41	38	76	4	16	13	15
Germany . . . . .	2004	11	26	28	56	3	8	10	17
Hungary . . . . .	2003	14	78	79	110	3	17	20	36
Ireland . . . . .	2005	20	26	16	9	3	2	5	3
Italy . . . . .	2002	7	12	19	32	2	4	5	6
Netherlands . . . . .	2004	7	21	12	23	3	11	5	9
Norway . . . . .	2004	20	23	24	22	7	13	8	6
Poland . . . . .	2004	21	48	33	31	3	8	7	6
Portugal . . . . .	2003	6	20	33	69	2	5	8	13
Russia . . . . .	2004	47	88	81	89	8	12	15	26
Switzerland . . . . .	2004	15	33	34	79	5	14	20	30
Ukraine . . . . .	2004	25	70	58	67	3	9	11	18
United Kingdom . . . . .	2004	8	16	9	13	2	6	4	4
Other Countries/Areas									
Australia . . . . .	2003	17	21	19	22	4	7	5	3
Canada . . . . .	2002	18	28	19	24	5	8	3	3
Chile . . . . .	2003	17	25	31	37	4	4	3	4
Cuba . . . . .	2004	8	31	45	76	3	10	15	13
Hong Kong . . . . .	2004	15	29	45	72	9	12	27	35
Israel . . . . .	2003	11	18	19	23	1	4	6	6
Japan . . . . .	2004	17	57	42	46	8	13	18	23
Kazakhstan . . . . .	2003	45	75	70	61	11	11	16	23
New Zealand . . . . .	2000	30	20	21	21	6	5	2	3
Panama . . . . .	2003	17	17	22	31	4	2	2	0
Singapore . . . . .	2003	12	15	19	58	9	9	17	30
South Korea . . . . .	2004	11	50	105	174	8	16	36	79
Thailand . . . . .	2002	14	14	17	16	4	6	5	5
United States . . . . .	2002	17	24	25	41	3	7	4	4

Source: World Health Organization, <[www.who.int/mental\\_health/prevention/suicide/country\\_reports/en/](http://www.who.int/mental_health/prevention/suicide/country_reports/en/)>, accessed on August 8, 2007.

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Box 4-2.

**Suicide Rates Much Higher Among Older Men Than Women—Con.**

Kong, Japan, Singapore, and Switzerland have comparatively high rates among older women. Levels for older men in the United States are average when compared with other countries, whereas the U.S. rate for women aged 65 and over is relatively low. Although some of these international differentials may be artificial due to variation in the reporting and/or diagnosis of suicide, their sheer magnitude suggests that real international differences do exist.

Data from the World Health Organization for the past 35 to 40 years do not show any clear trend in suicide rates for the older population in the world's more developed countries. Few nations have experienced

the very gradual rise seen in France until the mid-1980s or the downward tendency observed in the United Kingdom. More often, national rates have fluctuated with no perceptible pattern. The unpredictability of suicide trends is perhaps best illustrated by the case of the Netherlands. Dutch society is widely recognized as being more tolerant of voluntary euthanasia than are other Western societies, and one might think it would also have higher rates of recorded suicide. However, the country's rates are lower than the industrialized-country average for most age groups, including older people, and have varied little during the past 30 years.

## CHAPTER 5.

# Health and Disability

Many societies worldwide have experienced a change from conditions of high fertility and high mortality to low fertility and low mortality, a process widely known as demographic transition. Related to this trend is “epidemiologic transition,” a phrase first used in the early 1970s (Omran, 1971) to refer to a long-term change in leading causes of death, from infectious and acute to chronic and degenerative. In the typical demographic transition described in Box 3-1, initial

mortality declines result primarily from the control of infectious and parasitic diseases at very young ages. As children survive and grow, they are increasingly exposed to risk factors associated with chronic diseases and accidents. When fertility declines and populations begin to age, the preeminent causes of death shift from those associated with infant and childhood mortality to those associated with older age. Eventually, the increase in the number and proportion of older adults shifts national morbidity profiles

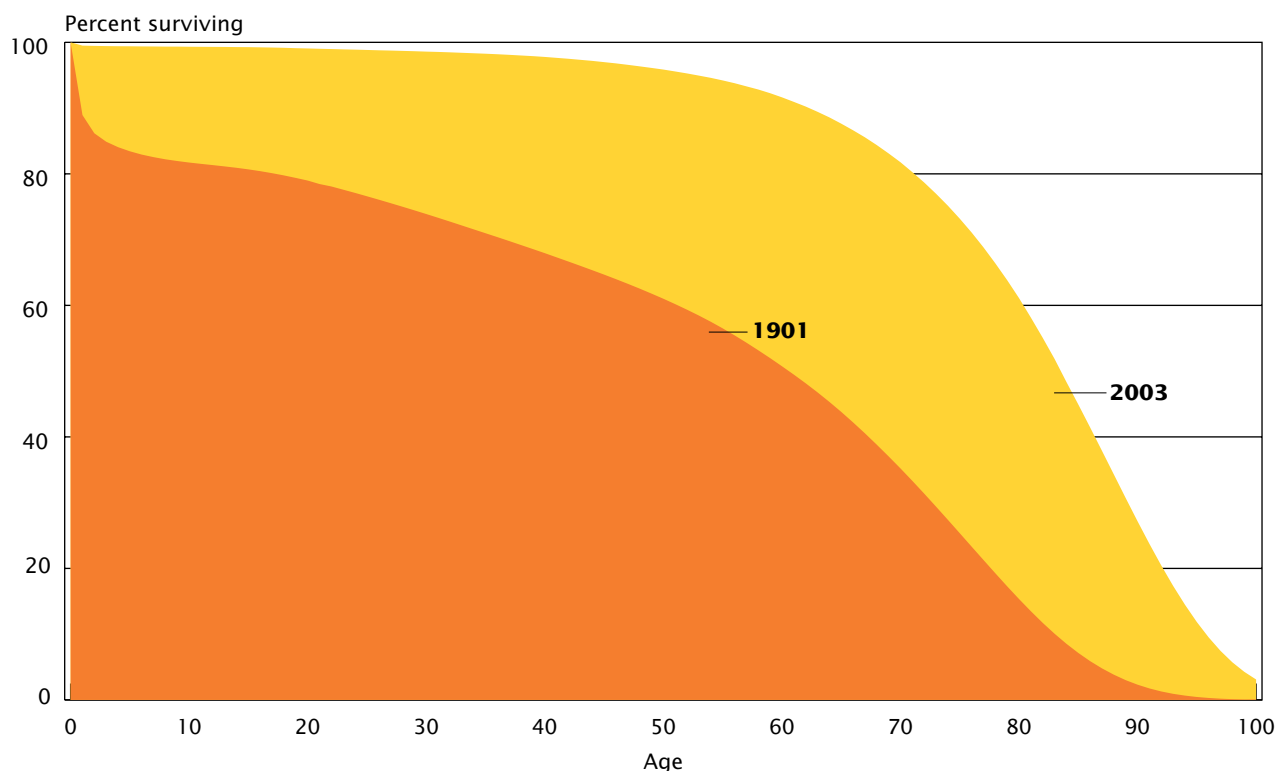
toward a greater incidence of chronic and degenerative diseases.<sup>1</sup>

### EPIDEMIOLOGICAL TRANSITION SHIFTS THE SURVIVAL CURVE

Figure 5-1, which shows survival curves for U.S. White females in 1901 and 2003, illustrates a general pattern seen in developed

<sup>1</sup> As with the concept of demographic transition, there are permutations and counterexamples of epidemiological transition, now sometimes referred to as health transition (Salomon and Murray, 2002; Vallin and Mesle, 2004; and Riley, 2005).

Figure 5-1.  
**Survival Curve for U.S. White Females: 1901 and 2003**



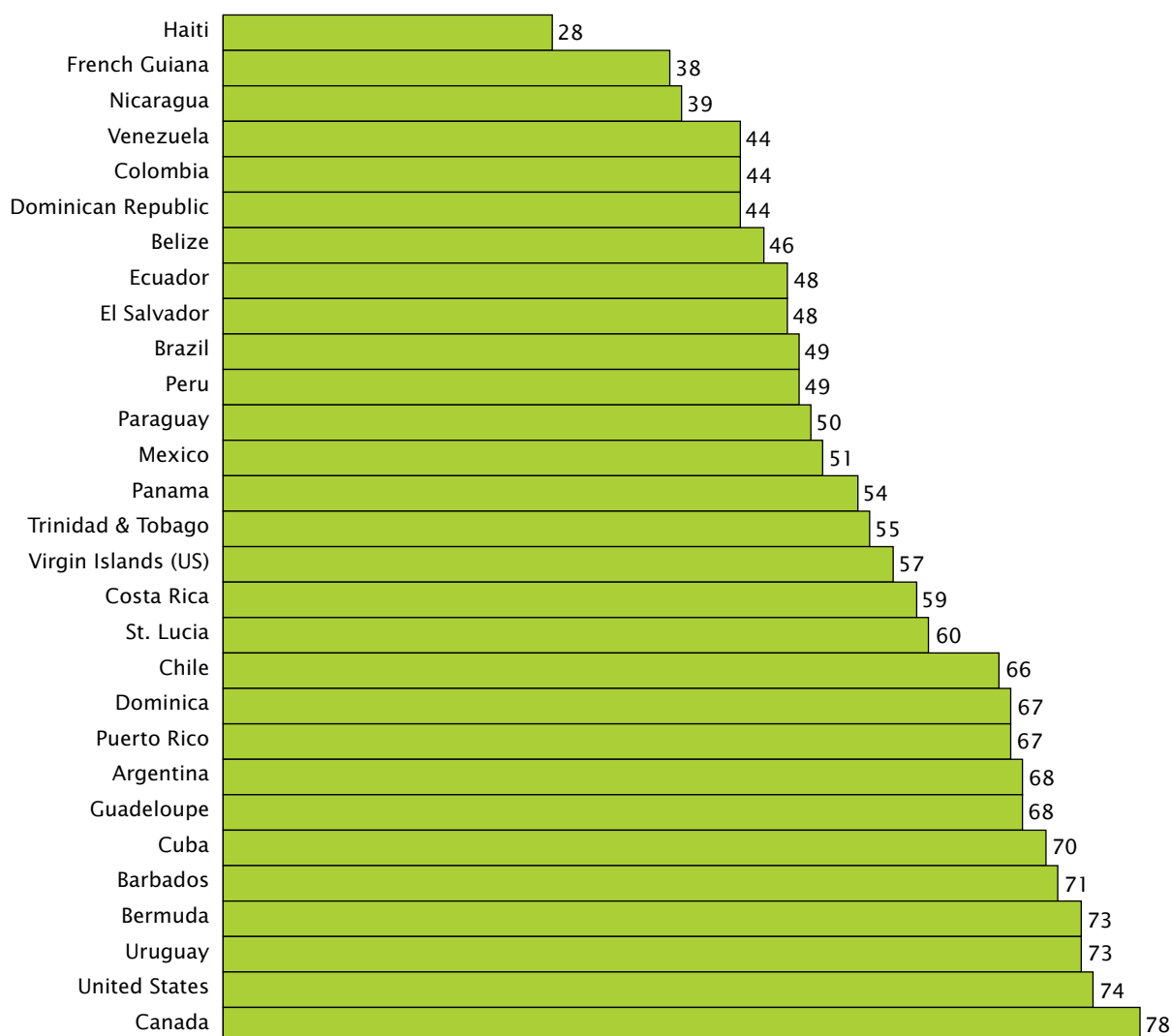
Sources: U.S. Census Bureau, 1936; and Arias, 2006.



Figure 5-2.

**Proportion of All Deaths Occurring at Age 65 or Over in 29 Countries/Areas: Circa 2001**

(In percent)



Source: Pan American Health Organization, 2007.

countries. The curve for 1901 represents the early stages of the epidemiological transition when the level of infant mortality is high; mortality is considerable through the middle years; and mortality increases at the later ages. Female life expectancy at birth was

approximately 50 years, and the median age at death (the age at which 50 percent of females subject to the mortality risks of 1901 could expect to survive) was about 60 years. By 2003, the survival curve had shifted substantially. Average female life expectancy had risen to 80 years, and the median

age at death was above 83 years. The proportion surviving is now quite high at all ages up to age 50, and the survival curve at older ages is approaching a more rectangular shape as a result of relatively higher chronic-disease mortality at older ages.

Table 5-1.

**Rank Order of the Ten Leading Causes of Death in Taiwan: 1956, 1976, 1996, and 2005**

Rank	1956	1976	1996	2005
1	GDEC <sup>1</sup>	Cerebrovascular disease	Malignant neoplasms	Malignant neoplasms
2	Pneumonia	Malignant neoplasms	Cerebrovascular disease	Cerebrovascular disease
3	Tuberculosis	Accidents	Accidents	Heart disease
4	Perinatal conditions	Heart disease	Heart disease	Diabetes mellitus
5	Vascular lesions of CNS <sup>2</sup>	Pneumonia	Diabetes mellitus	Accidents
6	Heart disease	Tuberculosis	Cirrhosis/chronic liver disease	Pneumonia
7	Malignant neoplasms	Cirrhosis/chronic liver disease	Nephritis/nephrosis	Cirrhosis/chronic liver disease
8	Nephritis/nephrosis	Bronchitis <sup>3</sup>	Pneumonia	Nephritis/nephrosis
9	Bronchitis	Hypertensive disease	Hypertensive disease	Suicide
10	Stomach/duodenum ulcer	Nephritis/nephrosis ulcer	Bronchitis <sup>3</sup>	Hypertensive disease

<sup>1</sup> GDEC includes gastritis, duodenitis, enteritis, and colitis (except diarrhea of newborns).

<sup>2</sup> CNS refers to the central nervous system.

<sup>3</sup> The bronchitis category for 1976 and 1996 includes emphysema and asthma.

Source: Taiwan Department of Health.

### DEVELOPING-COUNTRY TRANSITION MOST APPARENT IN LATIN AMERICA

Developing countries are in various stages of epidemiological transition. Aggregate regional change has been most evident in Latin America and the Caribbean, where the latest data show that cardiovascular diseases (CVDs) were the leading cause of death in 26 of 32 countries and areas (Pan American Health Organization, 2007). Most deaths from chronic and degenerative ailments occur at relatively old ages. Comparative data circa 2001 for the Western Hemisphere (Figure 5-2) show that half or more of all deaths in a majority of nations occur at ages 65 and over.

The pace of epidemiological change in some eastern and south-eastern Asian nations has been especially rapid. In the case of Singapore, where life expectancy at birth rose 30 years in little over a generation (from 40 years in 1948 to 70 years in the late 1970s), the share of cardiovascular deaths rose from 5 percent to 32 percent of all deaths, while deaths due to infectious diseases declined from 40 percent to 12 percent. Data from Taiwan (Table 5-1) exemplify the typical shift in causes of death; the

infectious and parasitic diseases that dominated Taiwanese mortality in the mid-1950s have given way to chronic and degenerative diseases. By 1976, cerebrovascular disease and cancers had become the leading causes of death. The situation in 2005 was similar to that in 1976, except that the relative importance of diabetes rose substantially, tuberculosis was no longer a major killer, and suicide became a prominent concern. Although time series data for much of the remainder of Asia and for Africa are lacking, scattered evidence suggests the increasing importance of chronic disease patterns in adult populations.

### IS A LONGER LIFE A BETTER LIFE?

Chapter 4 pointed out that continual increases in life expectancy, especially at older ages, have been the norm in most countries worldwide. As people live longer, the quality of that longer life becomes a central issue for both personal and social well-being. Are individuals living healthier as well as longer lives, or are ill health and disabilities characteristic of older years? In aging societies, the answer to this question will affect national health systems, retirement, and the demand for long-term care.

Research into patterns of change in mortality, sickness, and disability has suggested that these three factors do not necessarily evolve in a similar fashion. A four-country study (Riley, 1990) noted that in Japan, the United States, and Britain, mortality decreased and sickness (morbidity) increased, while in Hungary, mortality increased and sickness decreased.<sup>2</sup> Discrepancies between the trends in mortality, morbidity, and disability have generated competing theories of health change, several of which may be characterized as the following: a pandemic of chronic disease and disability (Gruenberg, 1977; and Kramer, 1980); the compression of morbidity into a short period before death (Fries, 1990); dynamic equilibrium (Manton, 1982); and the postponement of all morbid events to very old ages (Strehler, 1975). The World Health Organization has proposed a general model of health transition that distinguishes between total survival, disability-free survival, and survival without

<sup>2</sup> The author's broader review of historical data concludes that the relationship between falling sick and dying from sickness has shifted over time, and that the link between health risks and death has been unstable across time. The risk of being sick has increased as a result of various factors—among them earlier and better detection of sickness, declining mortality, and rising real income. The implication is that protracted sickness is a by-product of these achievements.

disabling chronic disease. In other words, it is desirable to disaggregate life expectancy into different health states to better understand the relative health of populations. Thus, a general survival curve, such as that in Figure 5-1, can be partitioned into different categories that include overall survival, survival without disability, and survival without disease.

### **CROSSNATIONAL ASSESSMENT OF HEALTH EXPECTANCY REMAINS ELUSIVE**

Since the early 1970s, research has been moving toward the development of health indexes that take into account not only mortality but also various gradations of ill health (e.g., Robine et al., 2003). “Health expectancy” has become a generic term for a class of population indicators that estimate the average time that someone could expect to live in various states of health (Mathers, 2002). Health expectancy can be measured in various ways; for example, years in good health, years free from disability, or years free from specific diseases. Healthy life expectancy is perhaps the most commonly used term, and most estimates of healthy life expectancy are derived from calculations of disability-free life expectancy using a methodology pioneered by Sullivan (1971). This methodology employs cross-sectional prevalence data but may produce results that underestimate temporal trends in a given population. Recognizing that these earlier computational approaches could not capture the full dynamic nature of disability, multistate models have been developed to incorporate processes, such as recovery and rehabilitation, into the calculations (Khoman and Weale, 2007). These

latter models, however, require longitudinal data that currently are unavailable or still being developed in most nations.

As of 2008, it remains impossible to strictly compare estimates of health expectancy among nations due to different computational methods and differences in concepts and definitions that define the basic data. Important distinctions between impairments, disabilities, and handicaps can lead to different measures of health status. Because the term “disability” is defined in many ways, national estimates of disability may vary enormously. The most commonly used measurement tools are scales that assess the ability of individuals to perform activities of daily living (ADLs) such as eating, toileting, and ambulation, as well as instrumental activities of daily living (IADLs) such as shopping and using transportation. These measures originated in industrialized societies where debate has centered on long-term care systems and individuals’ ability to function in everyday life.<sup>3</sup>

Some efforts have attempted to distill data from various national studies into reasonably comparable composites. A review of trend data from the latter part of the twentieth century in nine developed countries plus Taiwan suggested that disability generally was declining at older ages (Waidmann and Manton, 1998), though more recent information from Taiwan suggests

<sup>3</sup> ADL measures vary along several dimensions, including the number of activities considered and the degree of independence in performing physical activities. ADLs do not cover all aspects of disability, however, and are not sufficient by themselves to estimate the need for long-term care. Some older people have cognitive impairments not measured by ADL limitations, which may or may not be captured by IADL measures. Many questions also arise regarding the validity and applicability of such measures in different cultural settings.

the opposite pattern (Population Council, 2003). Researchers began to disaggregate disability into “more severe” and “less severe” categories, and the consensus in developed countries was that the overall decline in disability was primarily the result of declines in the more-severe forms (Robine and Romieu, 1998), as measured by limitations in ADLs. Changes in light or moderate disability, often measured with regard to IADLs rather than ADLs, were mixed (Jacobzone, Cambois, and Robine, 1999).

A more recent analysis (Lafortune et al., 2007) focused specifically on trends in severe disability, defined as having one or more limitations in basic ADLs. This study examined trend data up to 2005 for people aged 65 and over in 12 Organisation for Economic Co-Operation and Development (OECD) countries. The conclusion was less optimistic than the earlier picture—a distinct decline in severe disability among older people was seen in only 5 of the 12 countries (Denmark, Finland, Italy, the Netherlands, and the United States) (see Box 5-1 for more information on the United States). Data from Australia and Canada indicated a stable rate, while Belgium, Japan, and Sweden reported an increasing rate of severe disability at ages 65 and over. Data from different national surveys within France and the United Kingdom gave inconsistent results and did not allow a determination of trend.<sup>4</sup>

<sup>4</sup> Several factors other than actual increases in chronic disease incidence may contribute to reported declines in healthy life expectancy, including increased survival of chronically ill individuals due to improvements in medical care, earlier diagnosis of chronic diseases, greater social awareness of disease and disability, earlier adjustment to chronic conditions due to improved pension and health care/delivery systems, and rising expectations of what constitutes good health or normal functioning.

Box 5-1.

## Disability Decline in the United States

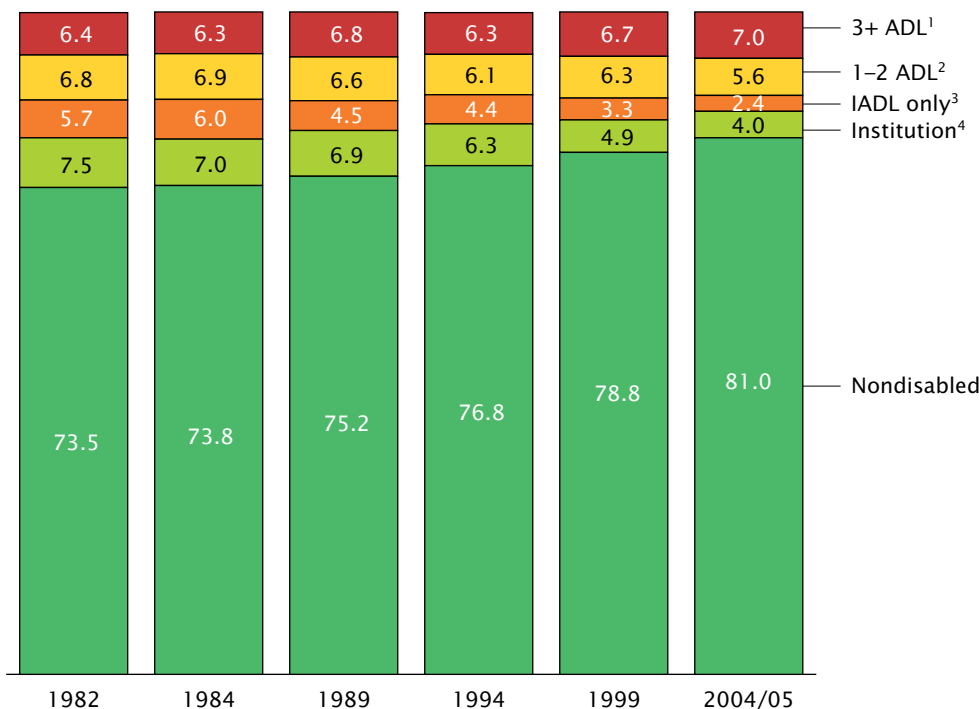
Mounting evidence suggests that disability rates in later life have been declining in the United States. Data from six rounds of the U.S. National Long Term Care Survey demonstrate that the disability rate among people aged 65 and over declined over a 23-year period (Manton, Gu, and Lamb, 2006) (Figure 5-3). At least five other U.S. surveys, while varying in content and nature (both cross-sectional and longitudinal), have yielded findings that support a temporal decline. Most recently, an examination of data from 1997–2004 from the U.S. National Health Interview

Survey found declines in the percentage of older people reporting disability (Freedman et al., 2007). Changes in the prevalence of heart and circulatory conditions and visual limitations played a major role in this decline, although it appeared that increases in obesity have had a countervailing effect. Other positive factors include increased use of assistive technologies and changes in socioeconomic characteristics, such as higher educational attainment and declines in poverty (Schoeni, Freedman, and Martin, 2008).

Figure 5-3.

### Chronic Disability Decline in the United States: 1982 to 2005

(Percent of older people in each category)



<sup>1</sup> "3+ ADL" refers to difficulty with three or more basic activities of daily living (ADLs), such as eating, toileting, dressing, bathing, and ambulation.

<sup>2</sup> "1-2 ADL" refers to difficulties with one or two of these items.

<sup>3</sup> "IADL only" refers to difficulty with one or more instrumental activities of daily living (IADLs), such as preparing meals, managing money, shopping, performing housework, and using a telephone.

<sup>4</sup> "Institution" refers primarily to nursing homes.

Note: Data refer to the Medicare-enrolled population aged 65 and over.

Source: Manton, Gu, and Lamb, 2006.

Table 5-2.

**Average Annual Growth Rate in the Prevalence of Selected Conditions Among People Aged 65 and Over: Selected Periods, 1980 to 2005**

Country	Period covered	Arthritis	Heart problem	Diabetes	Hypertension	Obesity
Australia .....	1998–2003	0.3	0.9	6.8	3.3	(NA)
Belgium .....	1997–2004	0.1	0.3	5.1	3.2	1.1
Canada .....	1996–2003	1.6	3.0	3.7	3.9	<sup>1</sup> 2.9
Denmark .....	1987–2005	(NA)	(NA)	3.3	(NA)	1.6
Finland .....	1980–2000	–0.6	(NA)	0.4	0.7	1.4
Italy .....	1991–2000	2.3	1.1	0.6	6.3	3.0
Japan .....	1989–2004	1.4	2.4	5.3	1.0	(NA)
Netherlands .....	1990–2000	1.8	3.0	1.2	1.8	3.8
Sweden .....	1980–2004	(NA)	(NA)	0.9	0.9	2.0
United Kingdom .....	1994–2003	(NA)	–	7.4	(NA)	3.2
United States .....	1992–2002	0.6	–0.3	2.2	1.5	3.5

(NA) Not available.

– Represents or rounds to zero.

<sup>1</sup> The trend for obesity in Canada refers to ages 75 and over.

Source: Lafortune et al., 2007.

**PREVALENCE OF CHRONIC CONDITIONS IS INCREASING WHILE DISABILITY IS DECREASING IN DEVELOPED COUNTRIES**

Considering overall (light, moderate, and severe) disability, it appears that an increase in chronic health conditions is accompanied by a decrease in reported disability. The prevalence of five chronic diseases and risk factors was, with a couple of exceptions, seen to increase recently in each of the countries in Table 5-2 (Lafortune et al., 2007). This finding agrees with a separate analysis of U.S. survey data (Freedman et al., 2007) that notes a pattern of rising prevalence of chronic conditions accompanied by declines in the share of respondents who report disability

related to those conditions. Parker and Thorslund (2007) also conclude that trends in disease and functional limitation have taken different directions, implying an increased need for rehabilitative and assistive technologies.

**FEMALE ADVANTAGE IN LIFE EXPECTANCY PARTIALLY OFFSET BY DISABILITY**

The previous chapter documented the near-universal gender gap in life expectancy in favor of women. Data on health expectancies around the world indicate that a larger percentage of women than men report being disabled. Women acquire more co-morbid conditions as a result of living longer (Robine and Jagger, 2005). Data from the Survey on Health, Well-Being and Aging of

older adults in Latin America and the Caribbean reveal that 3 out of every 4 women reported suffering from at least 1 of 3 disabling conditions: arthritis, incontinence, and poor vision, with the latter contributing to falls, hip fractures, and depression (Pan American Health Organization, 2007). More women than men who reach older age can expect to spend a greater proportion of their remaining years in a severely disabled state. Several possible explanations of this difference have been proposed, including differential use of institutional care, higher rates of disabling diseases (e.g., depression and arthritis), reporting biases, and physiological differences (Cambois, Desquelles, and Ravaut, 2003; and Newman and Brach, 2001).

Box 5-2.

### **Socioeconomic Correlates of Mortality and Disability**

Diverse studies have identified a number of socioeconomic factors that affect health and longevity. Education is perhaps the most widely studied variable. Thirty-five years ago, Kitigawa and Hauser (1973) observed that people with higher education tend to live longer. In 2008, researchers demonstrated that life expectancy for better-educated people in the United States rose by about 3 years during the period 1981–2000, compared with half a year for less-educated people (Meara, Richards, and Cutler, 2008). Noticeable differences in cause-specific mortality among middle-aged and older women and men by educational level have been observed in eight European populations (Huisman et al., 2005). Studies in the United States and Canada have found that level of education is one of the few determinants consistently associated with maintaining good health in middle age and beyond (Martel et al., 2005; and LaFortune et al., 2007), and increased levels of education have been identified as a potential factor influencing disability decline (Freedman and Martin, 1999).

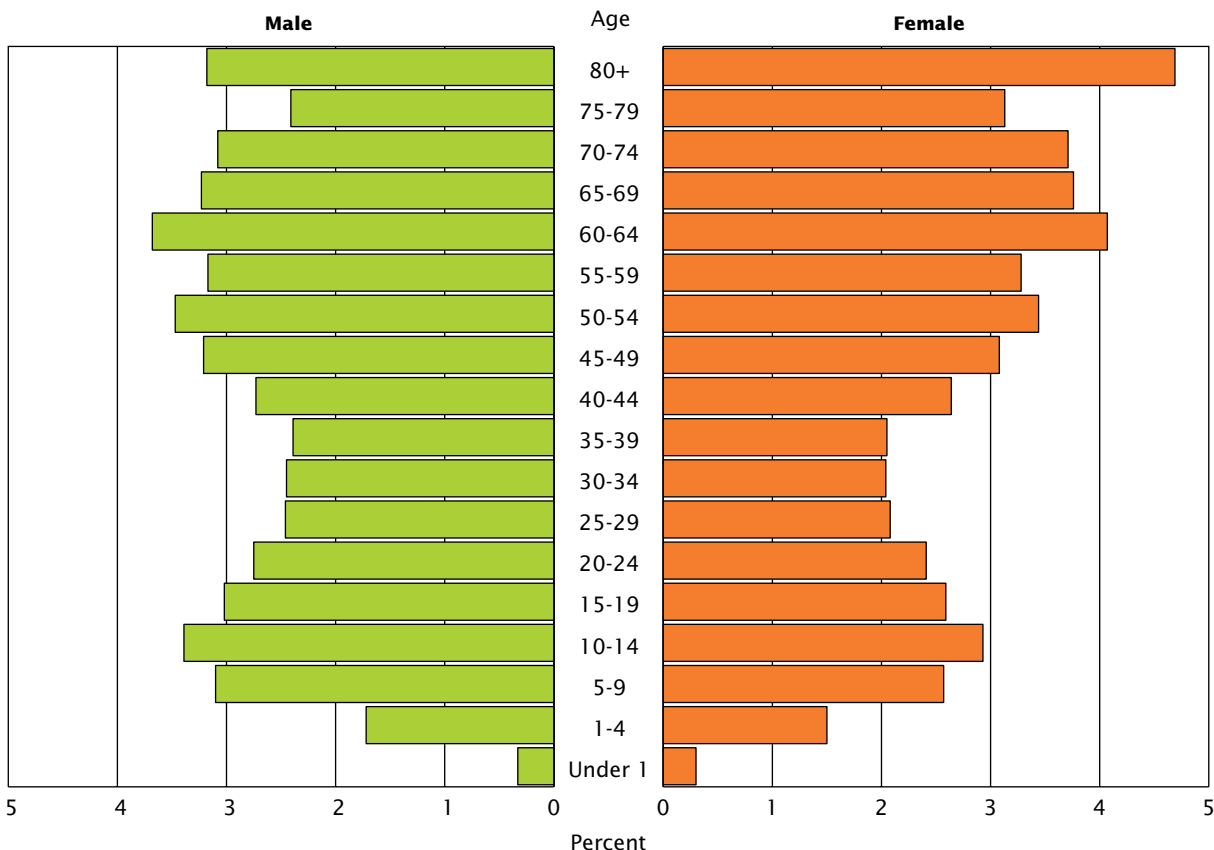
Income is another correlate of health. Low-income people aged 55 to 84 in the United States are more likely than wealthier older adults to feel limited in basic physical activities, such as climbing stairs and lifting objects (Minkler, Fuller-Thomson, and Guralnik, 2006). Cohort studies of British civil servants have demonstrated the importance of social class and occupational grade—people from lower grades age faster in terms of a quicker deterioration in physical health compared with workers from higher grades (Chandola et al., 2007). Being married encourages healthier behaviors in many adults,

including people in old age, relative to other marital statuses, and the effects may be larger for older men than for older women (Schone and Weinick, 1998).

The socioeconomic factors mentioned above are, to some extent, interrelated, and current analyses are interested in assessing the interactions of more than one variable with an individual's health. A recent Danish study, for example, found that the social gap in mortality levels widened during the past 25 years, especially for women with low education levels (Bronnum-Hansen and Baadsgaard, 2007). As more studies throughout the world collect longitudinal data, researchers increasingly will be able to understand multivariable effects over time. Survey data from the Health and Retirement Study (HRS) in the United States show not only a strong correlation between health and wealth but an added "marriage correlation" as well (U.S. National Institute on Aging, 2007). Data from the initial (1992) survey wave indicated that average household wealth for households where both partners were in excellent health was more than ten times higher than for households where both partners were in poor health (Willis, 1999). Such findings might have implications for assessing the future health status of older populations. For example, if marriage equates with better health among older individuals, do rising rates of divorce and increased proportions of never-married individuals portend poorer average health? And what of other life dimensions? A considerable amount of current research is focused on not only the social but also the psychological and biological influences on health (e.g., Weinstein, Vaupel, and Wachter, 2007).

Figure 5-4.

### Age and Sex Structure of Disability in the Philippines: 2005



Note: Each bar represents the number of disabled people in that age/sex group expressed as a percent of all disabled people.  
Source: Census data provided by the Philippines National Statistics Office.

### DISABILITY PREVALENCE IS LIKELY TO INCREASE IN DEVELOPING COUNTRIES

The number of disabled people in most developing countries seems certain to increase as a correlate of population growth. Figure 5-4 illustrates the age structure of disability in the Philippines as measured in the 2000 population

census.<sup>5</sup> The highest proportions of people with disabilities generally were seen in the older age groups. The median age of people with disability was 49 years, compared with an overall median population

<sup>5</sup> Censuses are not the best data collection instruments to measure disability since census questions tend to elicit "yes/no" responses, and the census process does not allow in-depth probing of respondents' health statuses. Still, census data can provide a broad picture of disability by age and sex at the population level.

age of 21 years. Even if disability rates were to decline somewhat over time, the aging of the Filipino population implies increasing numbers of disabled people. In view of declining fertility and changing family structures (see Chapter 7), families in developing countries likely will be challenged to provide the future service and care requirements of older people.



Table 5-3.  
**Rank Order of Disease Burden in High-Income Versus Low- and Middle-Income Countries: 2001**

(Disease burden measured in disability-adjusted life years)

Rank	Disease or injury	
	High-income countries	Low- and middle-income countries
1	Ischemic heart disease	Perinatal conditions
2	Cerebrovascular disease	Lower respiratory infections
3	Unipolar depressive disorders	Ischemic heart disease
4	Alzheimer and other dementias	HIV/AIDS
5	Lung, trachea, and bronchus cancers	Cerebrovascular disease
6	Hearing loss	Diarrhoeal diseases
7	Chronic obstructive pulmonary disease	Unipolar depressive disorders
8	Diabetes mellitus	Malaria
9	Alcohol use disorders	Tuberculosis
10	Osteoarthritis	Chronic obstructive pulmonary disease

Source: Lopez et al., 2006.

## BURDEN OF NONCOMMUNICABLE DISEASE IS GROWING

Two decades ago, the World Health Organization noted a distinction in prominent causes of disability between developed and developing countries. In the latter, disability stemmed primarily from malnutrition, communicable diseases, accidents, and congenital conditions. In industrialized countries, disability resulted largely from the chronic diseases discussed earlier—CVD, arthritis, mental illness, and metabolic disorders—as well as accidents and the consequences of drug and alcohol abuse. As economies in developing countries expand and the demographic and epidemiological pictures change, the nature and prevalence of various disabilities may also change.

A major ongoing effort to understand and predict the effect of

epidemiological change is the Global Burden of Disease (GBD) Project, currently spearheaded by the World Health Organization, the World Bank, and the U.S. National Institutes of Health. Using a computational concept known as disability-adjusted life years, this project attempts to measure global, regional, and country-specific disease burdens in a baseline year, and to project such burdens into the future. Table 5-3 contrasts the estimated rank order of disease burden for the ten leading disease categories in high-income countries and in low- and middle-income countries as of 2001. In high-income countries, most of the disease burden flows from chronic conditions, such as CVDs and neuropsychiatric disorders. In low- and middle-income nations, the most important factors in disability burden at the turn of the twenty-first century were problems related to

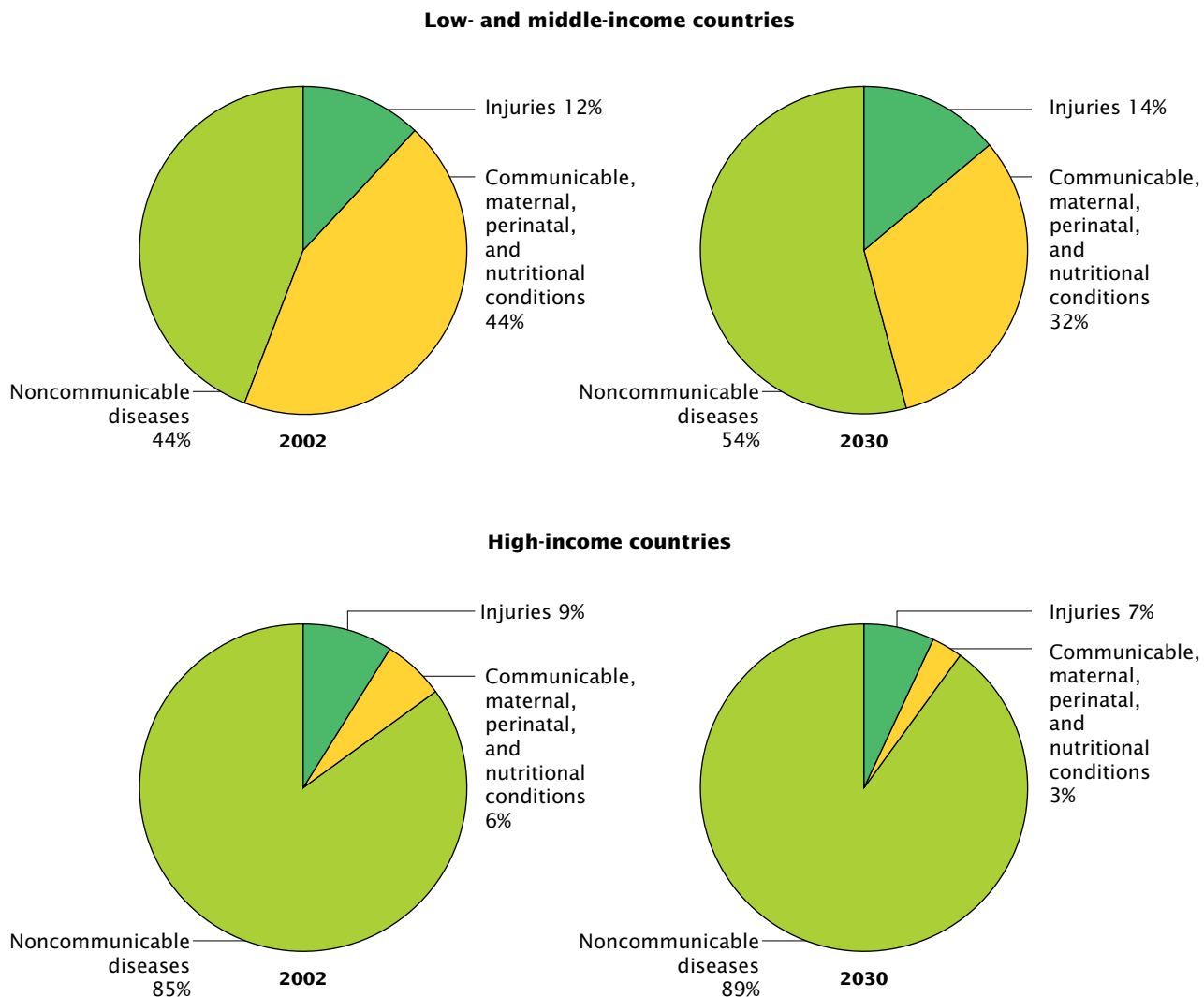
maternity and infant survival and to respiratory infections (Lopez et al., 2006).

During the next two to three decades, experts expect a major shift in disease burden such that noncommunicable diseases will no longer be seen primarily as diseases of affluent societies (Adeyi, Smith, and Robles, 2007). The GBD project estimated that in 2002, noncommunicable diseases accounted for 85 percent of the burden of disease in high-income countries, compared with 44 percent in low- and middle-income countries. Noncommunicable diseases already account for as much of the burden of disease in low- and middle-income countries as all communicable diseases, maternal and perinatal conditions, and nutritional deficiencies combined (Figure 5-5). By 2030, according to projections, the share of the burden attributed to noncommunicable diseases in low- and middle-income countries will exceed one-half, while the share attributed to communicable diseases will fall to one-third. Noncommunicable diseases already account for more than 87 percent of the burden for the 60-and-over population in low-, middle-, and high-income countries. The critical issue for low- and middle-income countries is how to mobilize and allocate resources to address chronic diseases as well as the relatively high prevalence of communicable diseases.



Figure 5-5.

## The Increasing Burden of Chronic Noncommunicable Diseases on Countries by Income Level: 2002 and 2030



Source: Lopez et al., 2006.

### OBESITY MAY THREATEN IMPROVEMENTS IN LIFE EXPECTANCY

The rise in the number of people who are overweight or obese has been described as a global pandemic.<sup>6</sup> An estimated 300 million

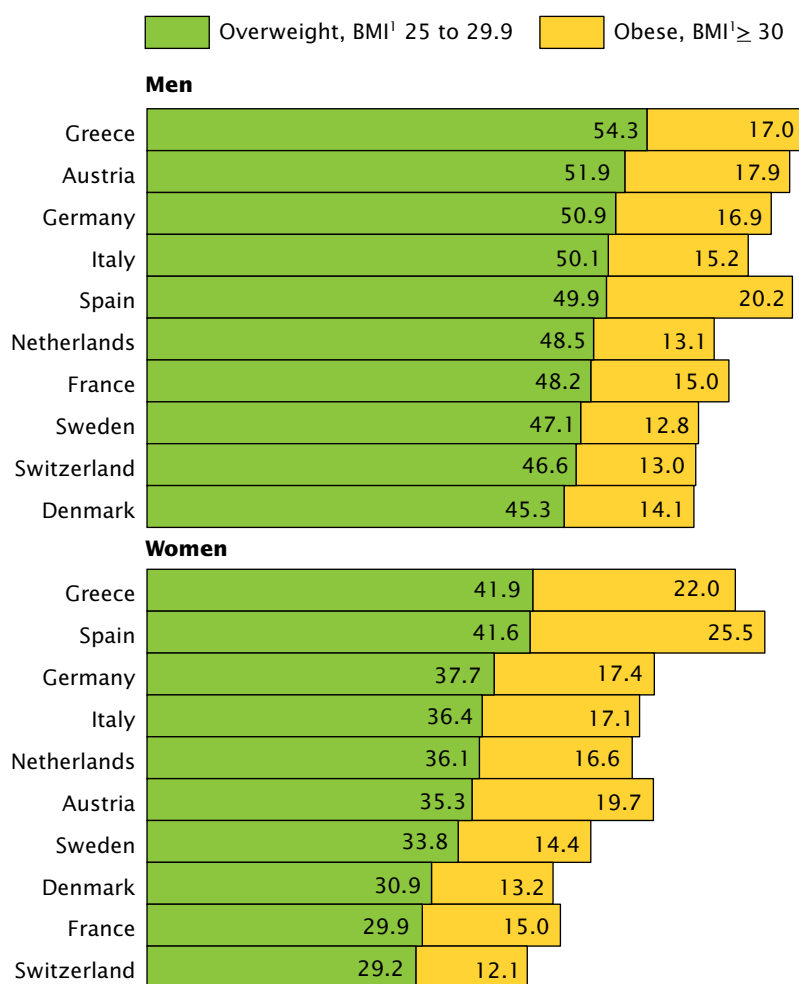
<sup>6</sup> Obesity is defined as “weight that is dangerously excess because of its high proportion of body fat relative to lean body mass” (OECD, 2006b). The most common measure of obesity is the body mass index (BMI), calculated as a person’s weight in kilograms divided by his or her height in meters squared. The standard

adults worldwide are obese and a majority are estimated to live in developed countries (World Health Organization, 2000). The average level of obesity in OECD countries has risen by 8 percent during the last two decades (Bleich et al.,

BMI categories are obese (BMI of 30 or higher), overweight (25 to 29.9), normal (18.5 to 24.9), and underweight (less than 18.5). It should be noted that BMI does not distinguish body fat from bone and muscle mass, leading some researchers to argue for alternate measures (Burkhauser and Cawley, 2008).

2007). It seems clear that, over such a relatively short period of time, genetic factors are not the cause of rising obesity. Rather, increased average weight is a function of how much people eat, the types of foods consumed (e.g., more energy-dense, nutrient-deficient foods), and lifestyle changes related to physical and sedentary activities. Research further suggests that the biological and behavioral

Figure 5-6.  
**Percent Overweight and Obese Among Men and Women Aged 50 and Over in Ten European Countries: 2004**



<sup>1</sup> BMI is body mass index.

Source: Andreyeva, Michaud, and van Soest, 2005.

traits of obesity are influenced by social networks and social ties (Christakis and Fowler, 2007).

Figure 5-6 presents a snapshot of the proportions overweight and obese for people aged 50 and over in 2004 in ten Western European countries that participate in the Survey of Health, Ageing and

Retirement in Europe (SHARE). When the two measures are combined, 59 percent to 71 percent of men aged 50 and over are overweight or obese in each country. Women in all the countries are less likely than men to be overweight or obese, with a range of 41 percent to 67 percent. The highest combined levels for men and women

are seen in Greece and Spain. While the combined levels for older women are lower than for older men, women tend to have higher levels of obesity.

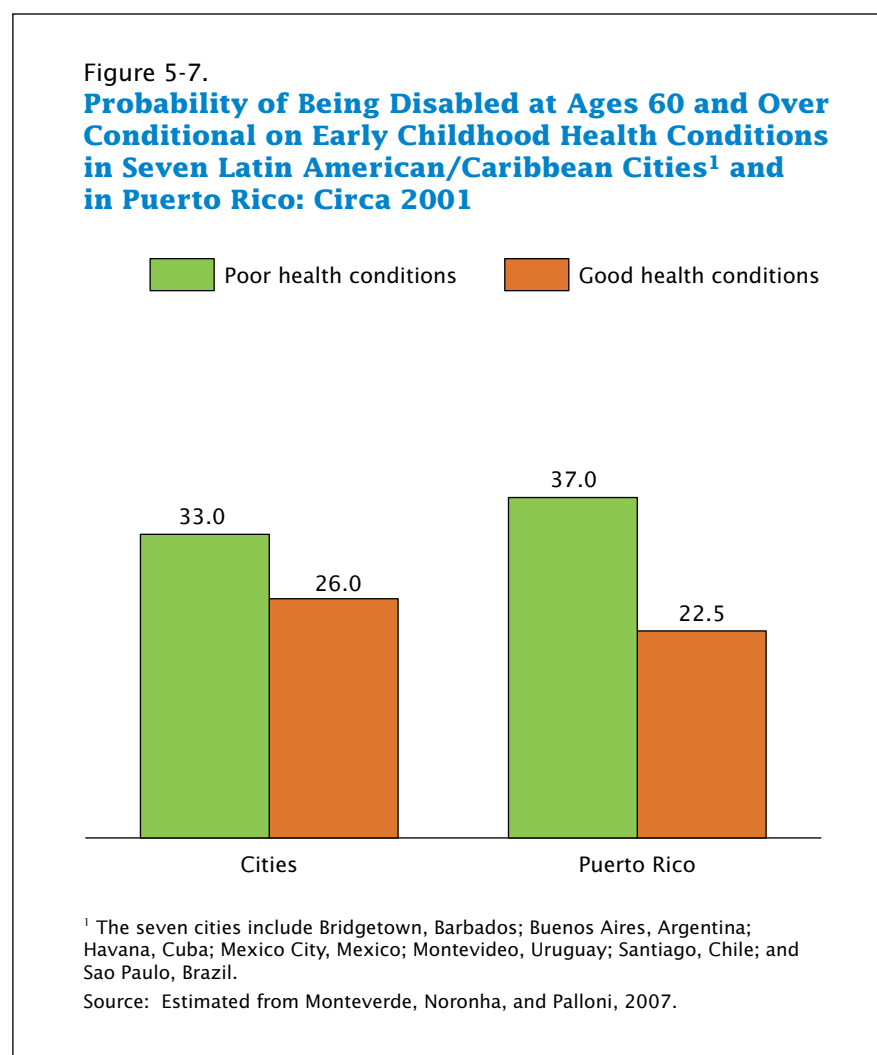
There has been considerable speculation about the social impact of rising levels of obesity. In terms of mortality, it has been suggested that current life expectancy in the United States would be higher if overweight individuals were instead at their “ideal” weight. Obesity’s tendency to reduce longevity means that the steady rise in U.S. life expectancy over the last two centuries could soon cease (Olshansky et al., 2005).<sup>7</sup> An analysis of the United States and Mexico concludes that among people aged 60 and over, larger losses in life expectancy associated with excess body fat appear among older people in Mexico than in the United States (Monteverde et al., 2007). On the other hand, some would argue that there is no consensus about the long-term consequences of obesity for overall mortality (Kramarow et al., 2007; and Preston, 2005). There seems to be more agreement that rising levels of obesity among older people will impact health and health care expenditures, given studies that show that the obese are more likely than the nonobese to have and report certain chronic conditions and that the former have higher levels of health care spending (OECD, 2006c).

<sup>7</sup> Factors other than obesity per se may also be at work. A study of mortality during the period 1996–2005 in the United States found that a large waist circumference was associated with an approximately 25 percent increase in mortality, even after adjustment for BMI (Koster et al., 2008).

## EARLY-LIFE CONDITIONS AFFECT ADULT HEALTH

The last two decades have seen a growing body of research that examines adult health from a life-course perspective. This research increasingly suggests that many negative health conditions in adulthood stem from risks established early in life (Gluckman and Hanson, 2004; Crimmins, 2005; and Case and Paxson, 2008). Some (notably, Barker, 2001) argue that adult health has a fetal origin whereby nourishment in utero and during infancy has a direct bearing on the development of risk factors for adulthood diseases (especially CVDs). Early malnutrition in Latin America is highly correlated with self-reported diabetes, and the experience of rheumatic heart fever is a strong predictor of adult heart disease (Palloni et al., 2006). Childhood infections may have long-term effects on adult mortality, and slow growth and lack of emotional support in prenatal life and early childhood reduce physical, cognitive, and emotional functioning in later years (Wilkinson and Marmot, 2003). Data on China's oldest old show that people who rarely or never suffered from serious childhood illnesses, or who received adequate medical care during sickness in childhood, had a greatly reduced risk of being cognitively impaired or ADL-impaired at ages 80 and over (Zeng, Gu, and Land, 2007).

Demonstrating that childhood conditions affect adult development and health is complicated because separating cohort effects from period effects (e.g., changing living conditions) is empirically difficult given the temporal and data requirements. The improvements in life expectancy at birth described in Chapter 4 largely are period effects of public health and medical advances. One study

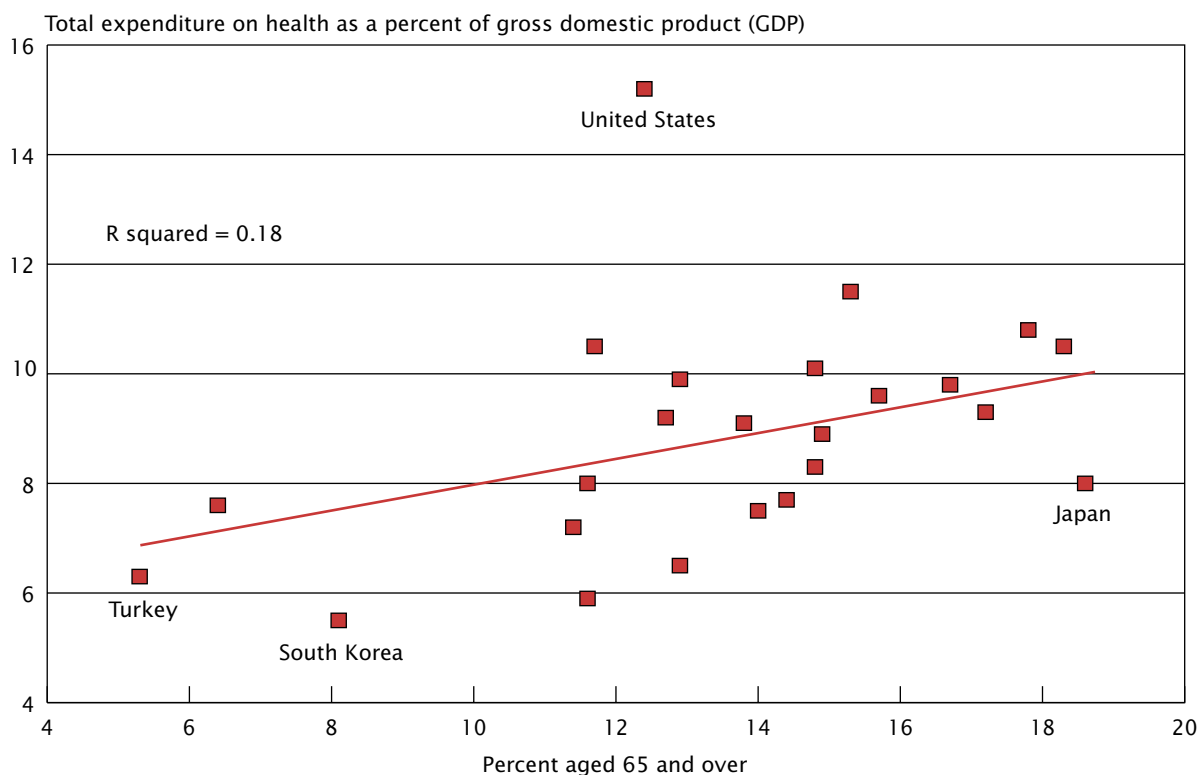


looked at reduced lifetime exposure to infectious diseases and other sources of inflammation in a nation with excellent historical data—Sweden—and concluded that reductions in early morbidity do have an impact on observed increases in life expectancy (Finch and Crimmins, 2004). Looking crossnationally at data from two surveys of older populations—1 in 7 urban centers in Latin America and the Caribbean and 1 in Puerto Rico—researchers investigated the risk of being disabled according to conditions experienced early in life (Monteverde, Noronha, and Palloni, 2007). The birth and development of today's older cohorts occurred during times characterized by generally poor nutrition and

exposure to infectious diseases, such as typhus, polio, malaria, and tuberculosis. In Puerto Rico, the probability of being disabled among people growing up in poor conditions was 60 percent higher than among people with better childhood socioeconomic levels. The corresponding figure among the urban centers was 22 percent (Figure 5-7). Current research is extending the range of causal early-life conditions. Currie (2008) argues that parental socioeconomic status affects child health, which, in turn, is related to future educational and labor market outcomes. A study in Denmark found that mortality rates in later life were influenced by features of the macroenvironment around the time of

Figure 5-8.

### Health Expenditure and Percent Aged 65 and Over in 24 OECD Nations: 2003



Sources: Organisation for Economic Co-Operation and Development (OECD), 2006d; and U.S. Census Bureau, International Data Base, accessed on September 10, 2007.

birth, such as the business cycle, food price deviations, and weather (van den Berg, Doblhammer-Reiter, and Christensen, 2008).

### DOES POPULATION AGING IMPACT HEALTH SYSTEM SOLVENCY?

Population aging might be expected to increase overall health care costs because health expenditures by and for older age groups tend to be proportionally higher than their population share. This could apply especially in nations where acute care and institutional (long-term care) services are widely available. A nine-country study in the 1990s found that the share of total health expenditure

attributed to people aged 65 and over ranged from 32 percent to 42 percent, compared with their population share of 12 percent to 18 percent (OECD, 1997). Per capita public health expenditures for older people are higher than for younger people; in OECD countries, there is about a four-fold difference between the 65-and-over and the under-65 aggregates (OECD, 2006c). However, per capita expenditures often level off or decline at ages above 80. There also are considerable per capita differences by country, which may be attributed to variations in program coverage.

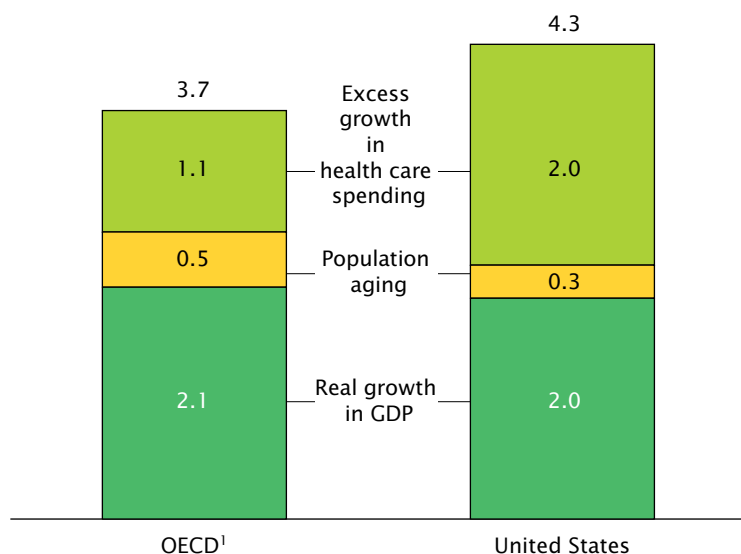
While health expenditures and population aging are related in OECD nations, the relationship is

fairly weak (Figure 5-8). A growing number of analyses suggest that population aging is not the main driver of health care costs. Other factors—rising per capita incomes, health insurance coverage, new medical technology, and workforce demographics that affect the unit cost of health care—may be more important (Reinhardt, 2003; Zweifel, Felder, and Werblow, 2004; and Bryant and Sonerson, 2006). One analysis of 21 OECD countries (White, 2007) breaks down the temporal trend in health spending per capita into three components: real growth in gross domestic product (GDP) per capita, changes in population aging, and an “excess growth”

Figure 5-9.

# **Components of Real Growth in Health Care Spending per Capita, United States and 20-Nation OECD Aggregate: 1970 to 2002**

(Average annual percent change)



<sup>1</sup> Organisation for Economic Co-Operation and Development (OECD).

Note: The rate of excess growth is calculated as the rate of health spending per capita minus the rate of real growth in gross domestic product (GDP) per capita minus the rate of population aging.

Source: White, 2007.

category above and beyond the increase attributable to economic growth and population aging. Over the period 1970–2002, real growth in per capita health care spending averaged 4.3 percent in the United States and 3.7 percent in the other OECD countries (Figure 5-9). About 2 percentage points of the growth

stemmed from real growth in GDP, while the effect of population aging was smaller. The major difference between the United States and the OECD aggregate is the rate of excess growth, calculated as the rate of health spending per capita minus the rate of real growth in GDP per capita minus the rate of

population aging. Excess growth likely is related to the diffusion of new health care technologies and institutional features of the health care financing and delivery system (Jenson, 2007).

Part of the debate over rising health care costs focuses on the distribution of expenditures by age. A large fraction of health care costs associated with advancing age are incurred in the year or years just prior to death (Lee, 2007; and Shugarman et al., 2004). As more people survive to increasingly older age, the high cost of dying is shifted to ever-older ages, which, in theory, means that most age-specific costs may decline (Bolnick, 2004). One contentious issue in many societies relates to the nature and extent of treatment at very old ages. In a review of primarily U.S. data, the International Longevity Center reports no evidence that aggressive care at the end of life is increasing nor any indication that the cost of dying is growing and will overwhelm the health care system (Pan, Chai, and Farber, 2007). At the same time, governments and international organizations are stressing the need for cost-of-illness studies on age-related diseases, in part to anticipate the likely burden of increasingly prevalent and expensive chronic conditions (of which Alzheimer's disease may be the most costly).

Box 5-3.

### **Middle-Aged Britons Are Notably Healthier Than Middle-Aged Americans**

Crossnational research using ongoing longitudinal studies in England and the United States has revealed that White non-Hispanic middle-aged Americans (aged 55 to 64) are not as healthy as their English counterparts, and in both countries, lower income and education levels are associated with poorer health. Comparable representative samples of people aged 55 to 64 from the U.S. Health and Retirement Study (HRS) and the English Longitudinal Study of Ageing (ELSA) were divided into three socioeconomic groups based on education and income. The samples were limited to White non-Hispanic populations, allowing researchers to control for special issues in different racial or ethnic communities in both countries. The healthiest Americans in the study, those in the highest income and education levels, had rates of diabetes and heart disease similar to the least healthy people in England, those in the lowest income and education levels (Banks et al., 2006).

In addition, the lowest income and education group in each country reported the most cases of diabetes, stroke, heart disease and heart attacks, and chronic lung disease, while the highest income and education groups reported the least. The only disease for which this inverse relationship was not true was cancer. Differences between the two countries in smoking, obesity, and alcohol use explained little of the difference. The researchers noted that the health status differences between the United States and England existed despite greater U.S. health care expenditures and similar patterns in life expectancy between the two countries.

A further study of U.S. health care expenditure levels exploited data from the Survey of Health, Ageing and Retirement in Europe (SHARE) and the HRS, in addition to other survey and secondary information (Thorpe, Howard, and Galaktionova, 2007). Results for 2004 suggested that disease prevalence and rates of medication treatment for people over the age of 50 were much higher in the United States than in ten European countries. The researchers noted that part of the difference may be related to a greater likelihood of diagnosis and treatment in the United States. For instance, the higher diagnosis rate for cancer in the United States appears to be a result of more intensive screening. However, higher rates of obesity-related diseases and conditions (e.g., high blood pressure) suggest that older Americans are less healthy than their European counterparts.

## Gender Balance, Marital Status, and Living Arrangements

One common characteristic of populations throughout the world is the preponderance of women at older ages. Globally in 2008, there are an estimated 62 million more women than men aged 65 and over. Women are the majority of the older population in the majority of countries, and their share of the population increases with age. This gender imbalance at older ages has many implications for population and individual aging, perhaps the most important of which involves marital status and living arrangements.

### OLDER POPULATION SEX RATIOS VERY LOW IN EASTERN EUROPE

The sex ratio, defined as the number of men per 100 women, is a common measure of a population's gender composition. Ratios over 100 indicate more men than women, and ratios under 100 indicate the opposite. The majority of the world's countries have

a sex ratio below 100 at ages 65 and over. This is primarily the result of higher male than female mortality rates beginning at birth and continuing throughout the life course, which leaves fewer men than women at older ages.

Fewer than two dozen countries have a sex ratio higher than 100 at older ages in 2008. At the other end of the spectrum are the very low sex ratios found in parts of the former Soviet Union and Eastern Europe. As of 2008, the world's lowest national sex ratio for the older population is 45 in Russia. Several other former Soviet republics (e.g., Belarus, Latvia, and Estonia) also have low sex ratios, as do several countries in South America and parts of Africa (Figure 6-1). The very low sex ratios in Eastern Europe derive partly from the lingering effects of heavy male mortality during World War II but more importantly stem from higher adult male than female mortality due to cardiovascular diseases,

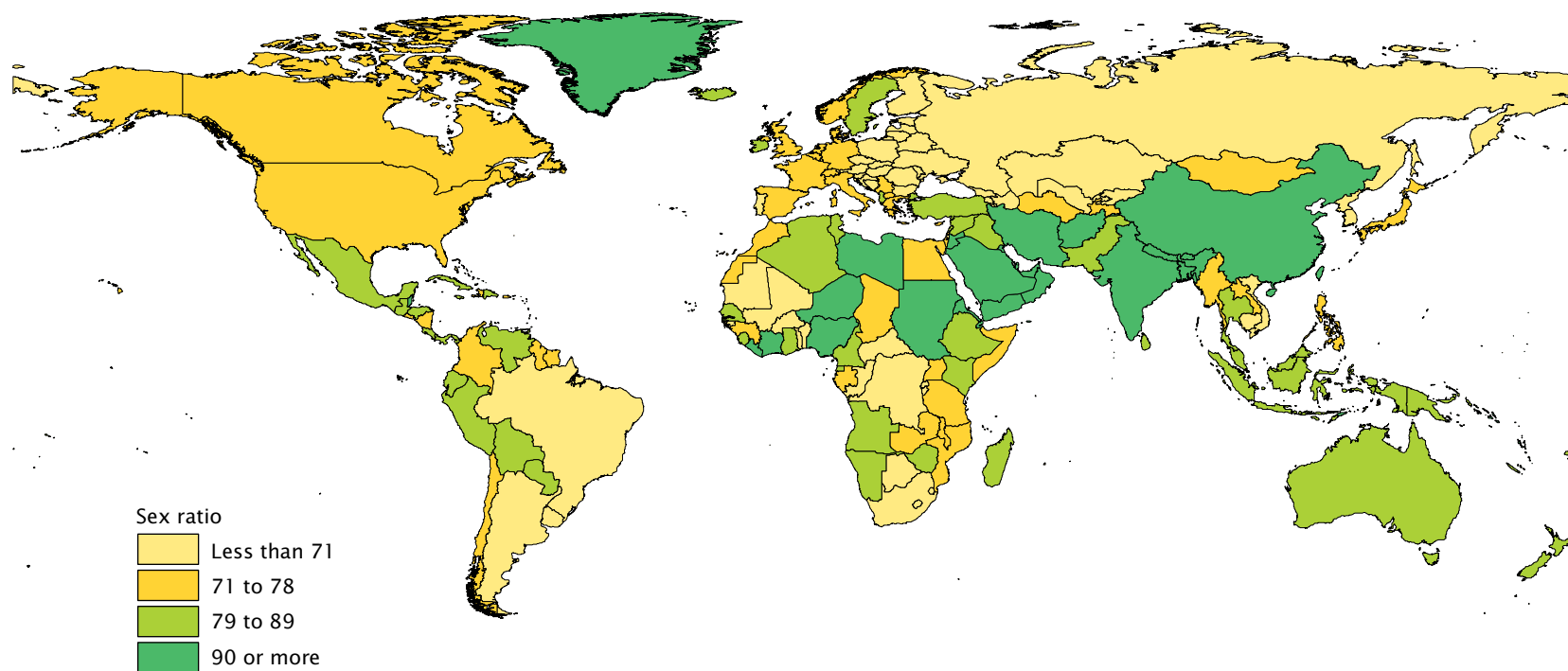
suicides, and other causes (Brainerd, 2001; Mesle and Vallin, 2002; and Varnik et al., 2001).

In the future, many countries with currently low sex ratios are projected to see an increase because adult male mortality rates are expected to improve faster than those of women.<sup>1</sup> All Eastern European and former Soviet Union countries, for example, are expected to experience an increase in this indicator between 2008 and 2040. The projected trend in aggregate sex ratios for developed countries is shown in Figure 6-2, with ratios increasing for ages 65 to 79 and 80 and over. The picture for developing countries is different. In the aggregate, projections suggest that there will be no appreciable difference between 2008 and 2040 at ages 65 to 79 and a decline in the sex ratio at ages 80 and over.

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<sup>1</sup> Sex ratios for four age groups in 2000, 2020, and 2040 for the 52 study countries are presented in Appendix Table B-4.

Figure 6-1.  
**Sex Ratio of the Older Population: 2008**  
 (Men aged 65 and over per 100 women aged 65 and over)

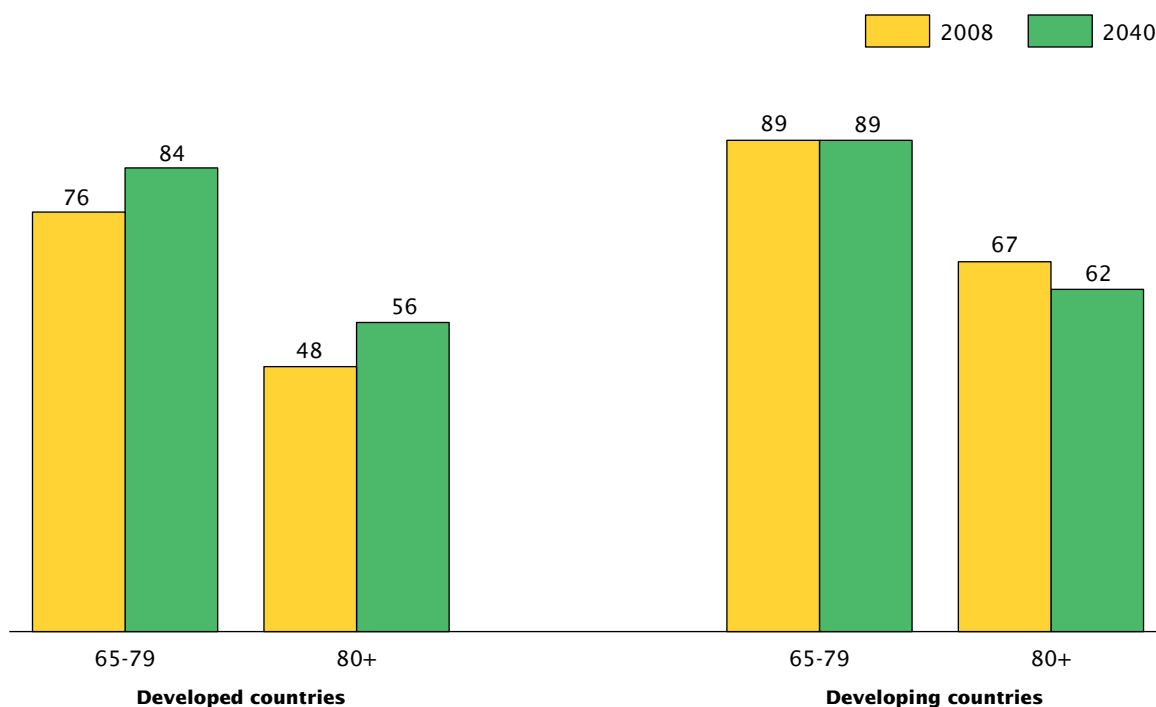


Source: U.S. Census Bureau, International Data Base, accessed on May 27, 2008.



Figure 6-2.

### Aggregate Sex Ratios for Older Age Groups: 2008 and 2040



Source: U.S. Census Bureau, International Data Base, accessed on May 20, 2008.

### OLDER MEN ARE MARRIED; OLDER WOMEN ARE WIDOWED

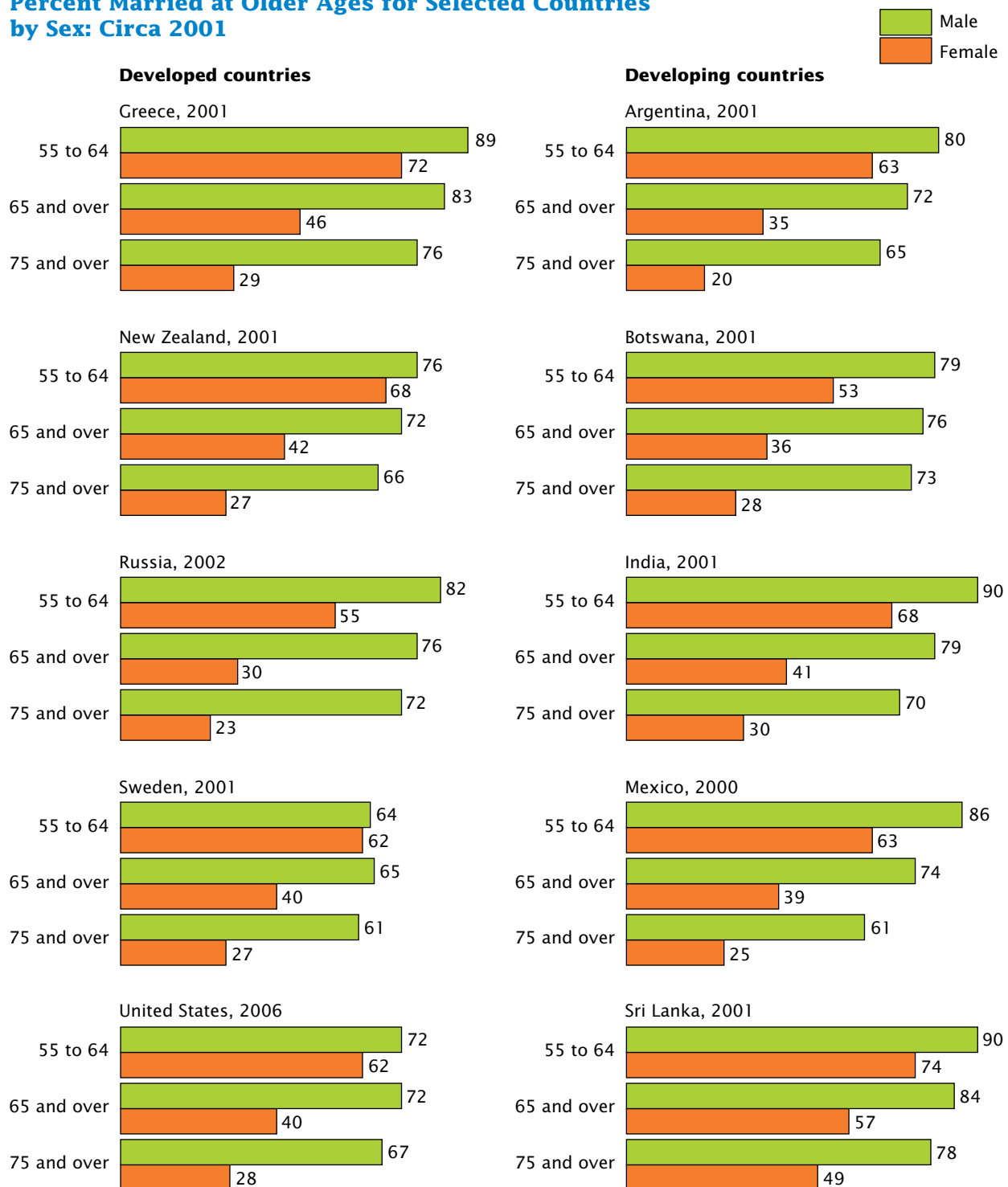
Extensive research has demonstrated that being married benefits older people's mental health and other health outcomes. Studies in Europe and the United States have shown that married older people generally are less likely to report depressive symptoms and are more likely to report satisfaction with life than their unmarried counterparts, and that men appear to benefit from marriage more than women (Brown, Bulanda, and Lee, 2005; Chipperfield and Havens, 2001; and Hagedoorn et al., 2006). Multicountry studies also show that married older people generally have lower mortality rates than their nonmarried counterparts

(Valkonen, Martikainen, and Blomgren, 2004; and Murphy, Grundy, and Kalogirou, 2007).

Older men are more likely to be married than older women. The latest available data on marital status for the study countries in this report show that about 60 percent to 85 percent of men aged 65 and over were married (Appendix Table B-6). Even at ages 75 and over, 70 percent of men in a majority of the study countries were married. In contrast, 30 percent to 40 percent of women aged 65 and over were married (with the exception of Sri Lanka, where the proportion was 57 percent in 2001). At ages 75 and over, on average, 20 percent of women were married. This pattern is found in developed and developing countries alike (Figure 6-3).

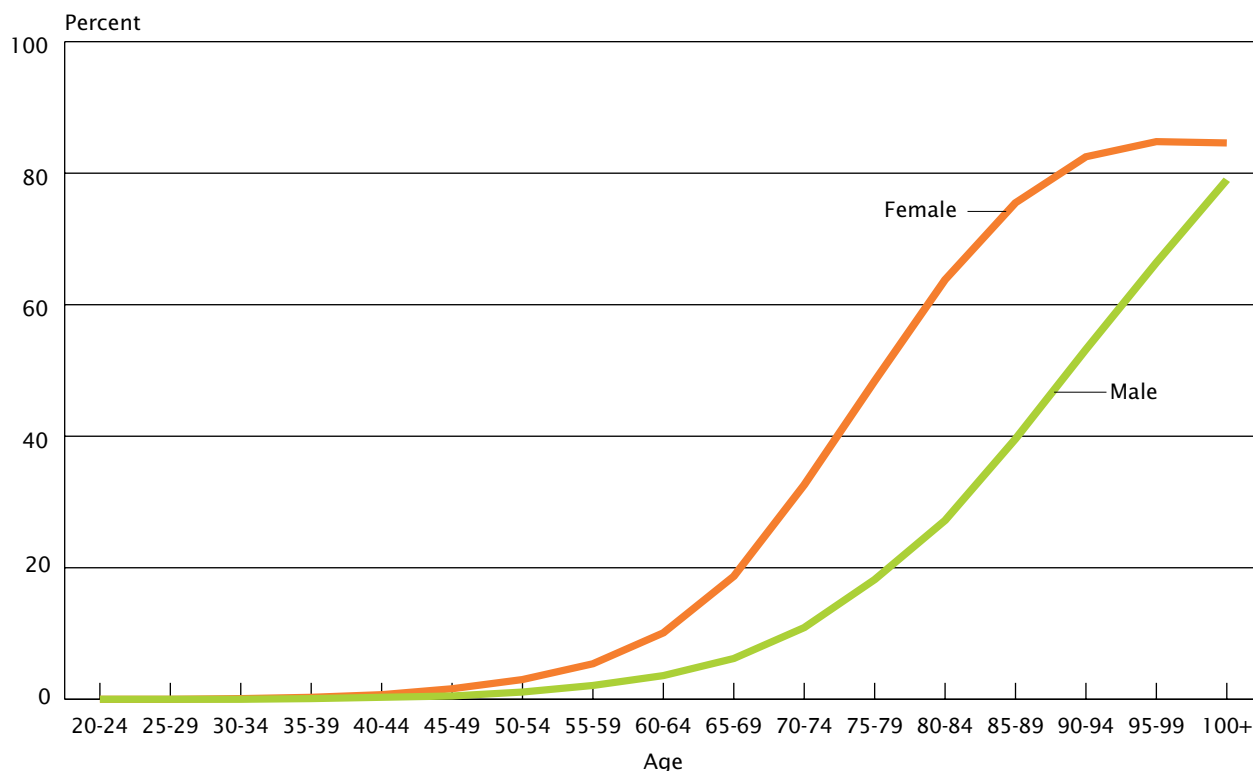
Widowhood has been associated with negative psychological well-being of older people, with studies showing that the widowed are more likely than other groups to be depressed and unhappy about life and to suffer from loneliness and boredom (Delbes and Gaymu, 2002; and Thierry, 2000). Data on widowhood in the study countries with available information show that while 20 percent or less of older men were widowed, the proportion widowed among older women generally was in the 40 percent range. More than half of all older women in Eastern European countries were widows, as was the case in most Asian and some Latin American study countries.

Figure 6-3.  
**Percent Married at Older Ages for Selected Countries  
 by Sex: Circa 2001**



Sources: Appendix Table B-6 and United Nations Department of Economic and Social Affairs, *Demographic Yearbook 2006 (Special Census Topic)*.

Figure 6-4.  
**Percent Widowed in Denmark by Age and Sex: 2007**



Source: Statistics Denmark, 2007.

### WIDOWHOOD RISES SHARPLY AFTER AGE 65

Data from Denmark in 2007 (Figure 6-4) display the typical upward curve of widowhood with age, as well as gender differences. Widowhood for men is minimal until age 50 and increases steeply from age 70 (11 percent) to age 90 (53 percent). Widowhood among women increases noticeably at an earlier age (10 percent by age 60) and rises steeply after age 65.

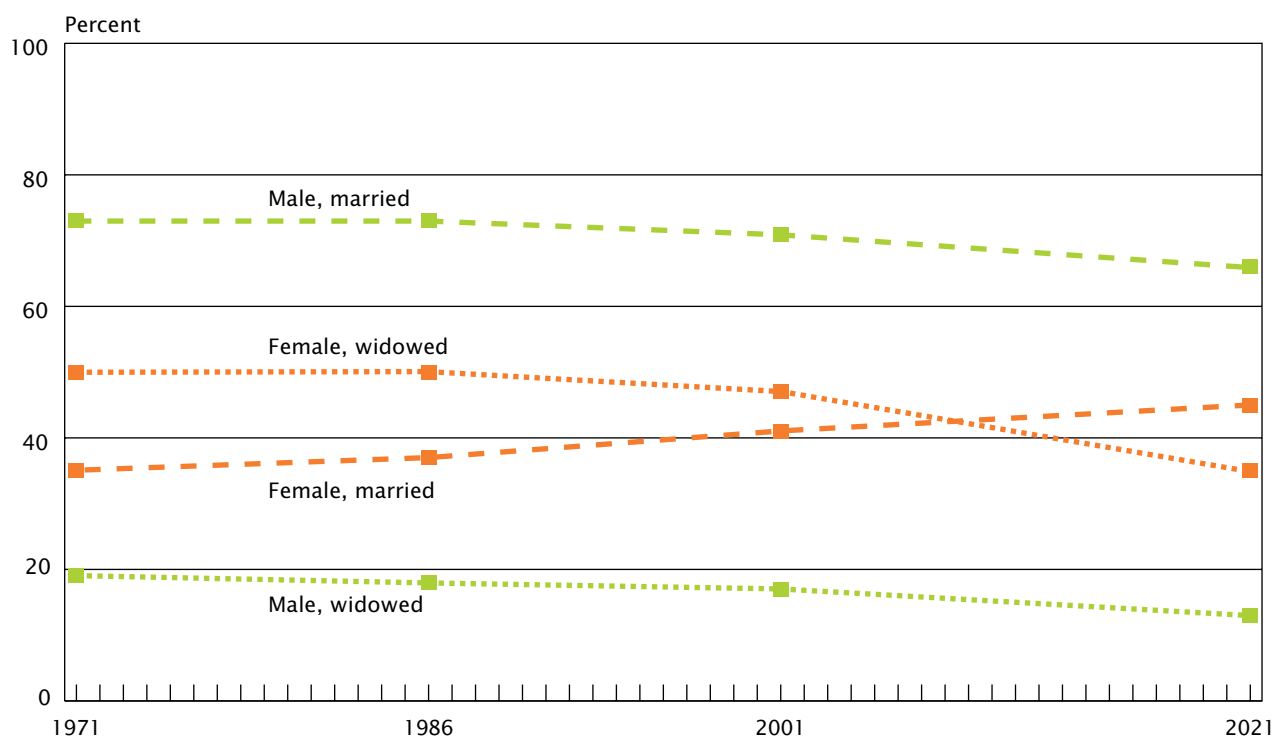
The gender difference in marital status results from a combination of factors. The first is the sex difference in longevity described in Chapter 4—women on average live longer than men. Secondly, women tend to marry men older than themselves which, combined with

the sex difference in life expectancy, increases the chance that a woman will be widowed in her older age. Furthermore, older widowed men have higher remarriage rates than older widowed women in many countries, often as a function of cultural norms. The fact that women are likely to outlive their spouse has important economic consequences for individuals and societies. A comparison of longitudinal data from Germany and the United States revealed that although the level of poverty is different in the two countries, most women in both nations experienced a decline in living standards upon widowhood and many fell into poverty as a result of the loss of public or private pension support (Hungerford, 2001). Another

study in four developed countries (United States, Germany, Great Britain, and Canada) found that women in low-income households were protected in all four countries by government programs that, on average, increased their household size-adjusted income following their husbands' deaths. In contrast, substantial declines in household size-adjusted income were more likely to be seen for women who lived in higher-income households prior to the deaths of their husbands (Burkhauser et al., 2005).

Trend data from Appendix Table B-6 suggest that the gender gap in proportions married among older people may be narrowing. Projections of marital status in the United Kingdom indicate that the married proportion

Figure 6-5.  
**Change in Proportions Married and Widowed for People Aged 65 and Over  
 in the United Kingdom by Sex: 1971 to 2021**



Source: United Kingdom Office for National Statistics, 2004.

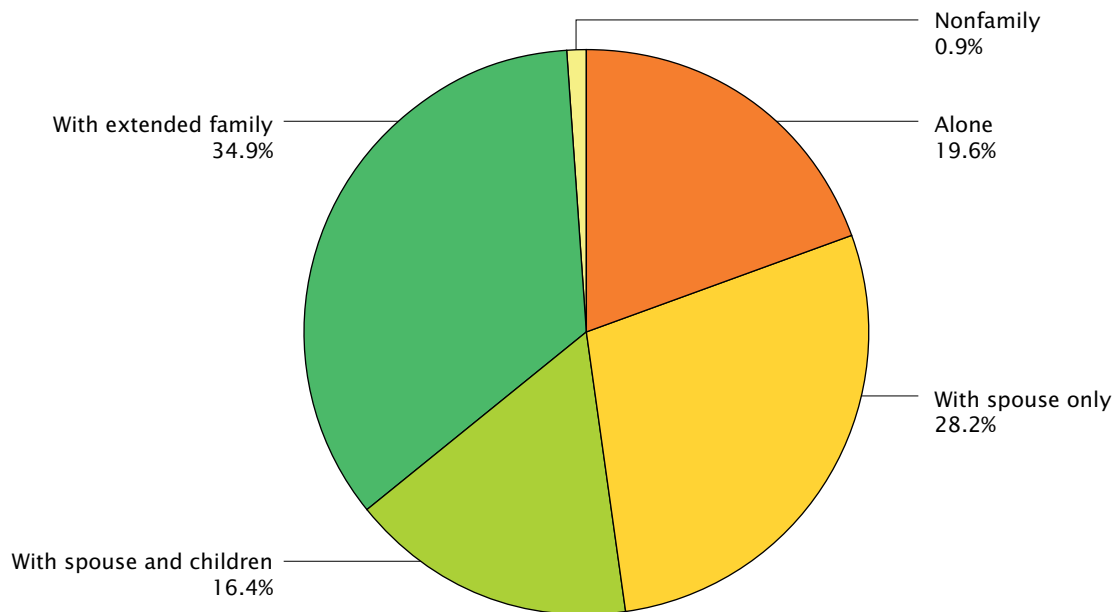
of older men will decline from 2001 to 2021, after being largely unchanged from 1971 to 2001 (United Kingdom Office for National Statistics, 2004). The percent married among older women increased during the 1971–2001 period, and the projected gender gap of 21 percentage points in 2021 is a reduction from 38 percentage points in 1971 (Figure 6-5). While a woman's likelihood of being widowed was stable from 1971 to 2001, the projected rate declines from 47 percent in

2001 to 35 percent in 2021. These changes are partly due to the narrowing of gender differentials in mortality discussed in Chapter 4, but they also reflect differences between generations in the propensity to marry earlier in life. Important differences are also seen crossnationally. In the 1960s, research identified what became known as the “Hajnal Line,” distinguishing northern and western parts of Europe, which historically had late ages of marriage and relatively large proportions who never

married, from southern and eastern regions in which marriage was earlier and more universal (Hajnal, 1965). Data from the late 1980s provide one illustration of this difference—2 percent of older men in Bulgaria had never married, compared with about 25 percent in Ireland (Grundy, 1996). The legacy of this difference persisted throughout the twentieth century and is still evident in the marital status distributions of today's older populations.

Figure 6-6.

**Living Arrangements for Household Population Aged 65 and Over in Argentina: 2001**



Note: Excludes older people living in institutions (about 2.8 percent of the total population aged 65 and over).

Source: Argentina National Institute of Statistics and Censuses, 2001 census data.

**MOST OLDER PEOPLE RESIDE WITH FAMILY**

The living arrangements of older people affect their life satisfaction, health, and chances of institutionalization. Marital status, availability of kin, personal wealth, health, and individual preferences are key determinants of an older person's living arrangements. Cultural norms and social transfers of time, space, and money are equally important in deciding whether an older person lives alone or with family members.

Crossnational comparisons of older people's living arrangements reveal substantial differences between developed and developing regions. A major difference is that older people (especially older women) in developed countries often live

alone, while living with kin is still the norm in the developing world. Census data for Argentina (Figure 6-6) show that more than half of all noninstitutionalized older people lived with their children and/or their extended family in 2001. More than one-fourth lived with their spouse only, while one-fifth lived alone. The latter two percentages are high by developing-country standards. In Indonesia, Singapore, and Taiwan, most older people share a residence with kin and maintain such living arrangements for many years (Frankenberg, Chan, and Ofstedal, 2002). In Bangladesh, more than 80 percent of older parents live with one or more children (Ghuman and Ofstedal, 2004). In rural China, where multigenerational households are nearly universal, older

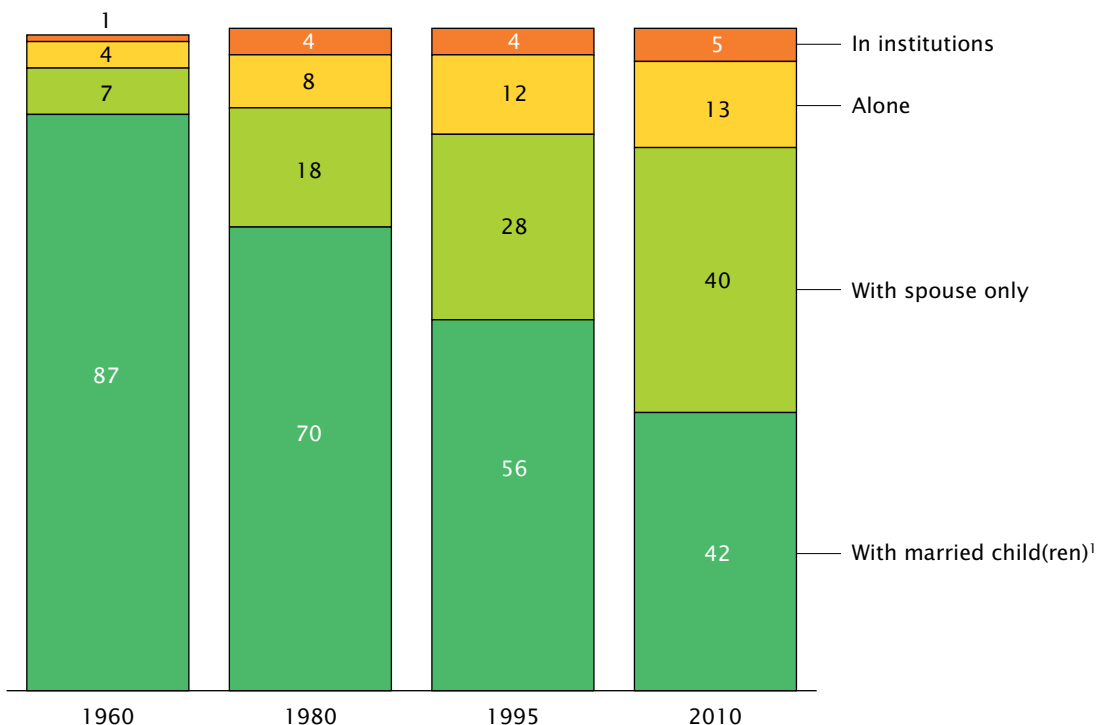
people benefit from extended family integration and experience favorable psychological outcomes (Silverstein, Cong, and Li, 2006). Studies throughout the developing world have consistently shown the predominance of older people's residence with adult children and/or grandchildren, and that older people rely heavily on family members for their well-being and survival (Bongaarts and Zimmer, 2002; and Zeng and George, 2000).

In addition to norms that place the responsibility for taking care of older people on their children, another reason for the prevalence of multigenerational coresidence in many developing nations is that social transfer programs that enhance old-age security and enable alternate

Figure 6-7.

### Living Arrangements for People Aged 65 and Over in Japan: 1960 to 2010

(In percent)



<sup>1</sup> Percentages living with married child(ren) include small numbers of older people living in unspecified arrangements.

Source: Japan National Institute of Population and Social Security Research.

living arrangements are lacking or just beginning. In contrast, most industrialized countries have well-developed social transfer systems (Palloni, 2001). Nevertheless, multigenerational living arrangements remain common in some Western countries. A study of the older population in Spain, for example, found that 66 percent of those widowed and 34 percent of those married lived with at least one child (Zunzunegui, Beland, and Otero, 2001). In addition, many older people not residing with their children lived in the same neighborhood as their children.

### INTERGENERATIONAL CORESIDENCE IS ON THE DECLINE

Although multigenerational family households, referred to here as “coresidence,” are still common, trend data show that multigenerational living arrangements have been declining in many countries, particularly in Europe. Over a 25-year period (1974 to 1999) in Greece, the proportion of unmarried older people living with a married child dropped from 23 percent to less than 9 percent, and the proportion of older couples residing with a married child declined from 14 percent to 5 percent. While coresidence of older people and their single children remained stable over time, the share of unmarried older people living alone

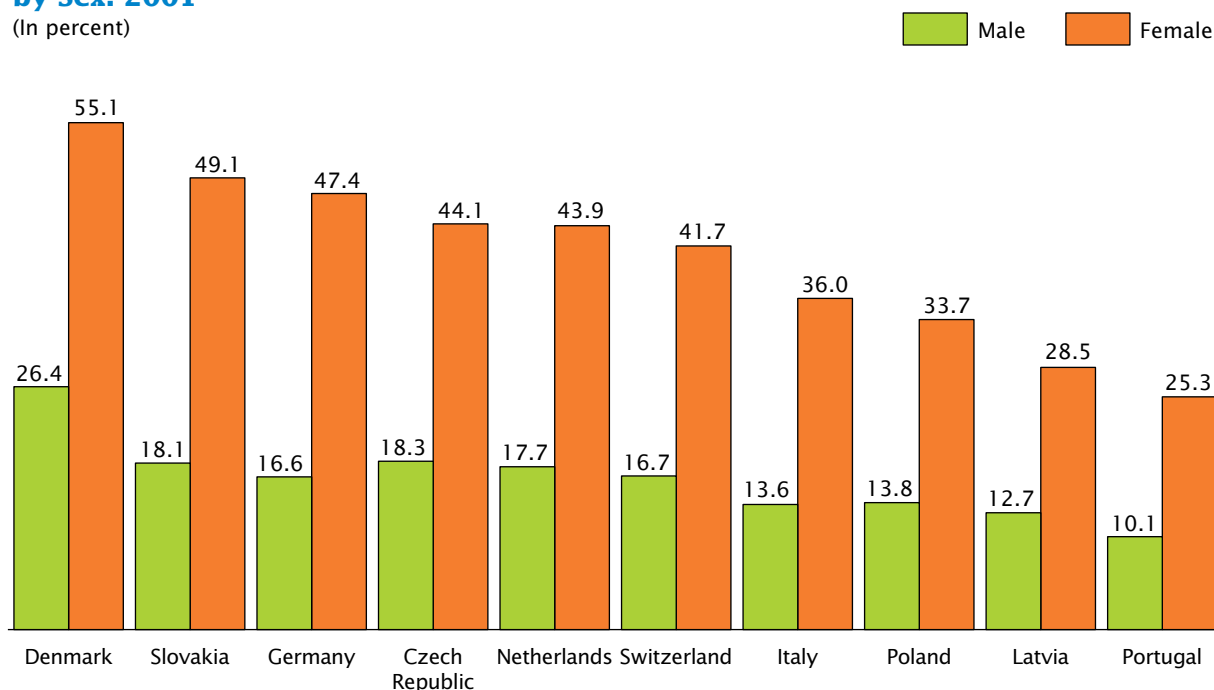
almost doubled (10 percent to 19 percent) during the 25-year period (Karagiannaki, 2005).

The decline of intergenerational coresidence has also occurred in Japan, where the extended family structure has historically been a prominent feature of society. During the 1960–1995 period, the proportion of older Japanese living with children dropped from 87 percent to 56 percent, and it is projected to decline further to 42 percent by 2010. At the same time, rising life expectancy has led to an increase in the joint survival of husbands and wives to ever-older age, and the share of older Japanese living with their spouse only has risen accordingly (Figure 6-7). Research on changing living arrangements

Figure 6-8.

# **People Aged 65 and Over Living Alone in Ten European Nations by Sex: 2001**

(In percent)



Source: Ireland Central Statistics Office, 2007.

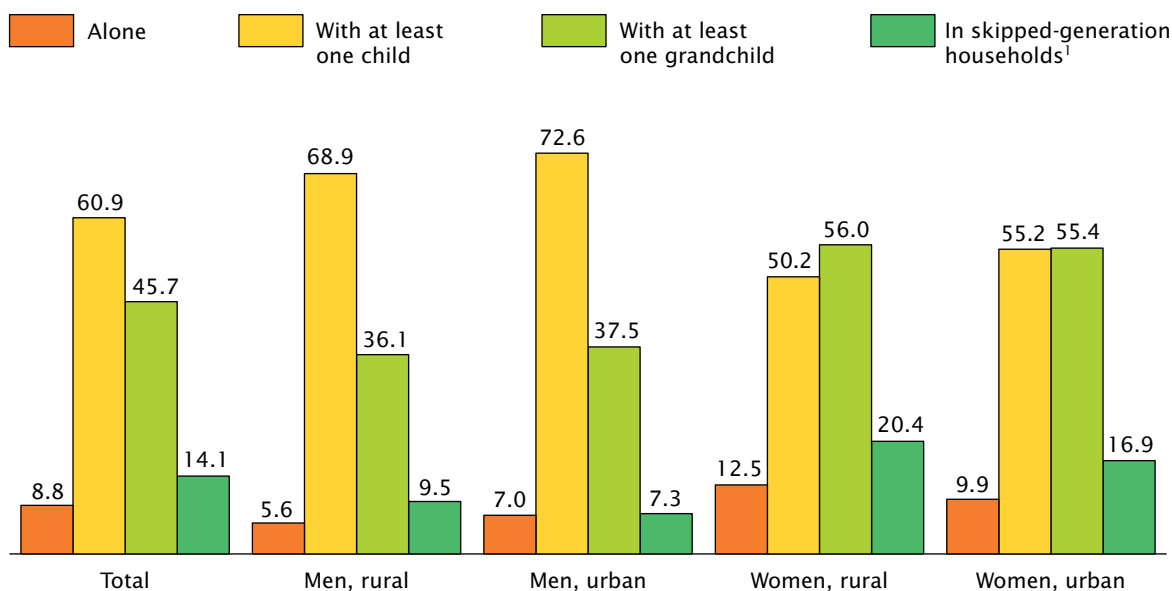
in Japan points to a shift from a traditional preventive approach of advance preparation for the age-related needs of older parents to a contingent approach of waiting until older parents have specific needs (Takagi, Silverstein, and Crimmins, 2007). There is evidence that older parents who begin living with an adult child relatively late in the child's life are more likely than other parents to be widowed and/or in poor health.

When studying the decline in the trend of intergenerational coresidence, some researchers hold that the main contributing factor

was the increasing resources of the older people that facilitated independent living, while others found that the primary cause was increasing opportunities for the young combined with declining parental control over their children (Engelhardt, Gruber, and Perry, 2005; McGarry and Schoeni, 2000; and Ruggles, 2007). Researchers also caution against using data at a given point in time or on aggregate trends over time as prevalence measures because these measures do not capture individual-level transitions in coresidence of adult children and parents. Longitudinal data on the living

arrangements of older people in Taiwan from 1989 to 2003 showed substantial fluctuations in their coresidence status (Hermalin et al., 2005). The study also found that many of the socioeconomic factors that predict coresidence status at a single point of time did not explain transitions in living arrangements, and the authors suggested that future research on the determinants of transitions should incorporate changes in life course events, such as the health and resources of the older people as well as opportunities and constraints for their children.

Figure 6-9.  
**Living Arrangements for People Aged 60 and Over in  
 Sub-Saharan Africa by Residence: Circa 2003**  
 (In percent)



<sup>1</sup> A skipped-generation household consists of at least one grandchild but no own children. Categories are not mutually exclusive or exhaustive.

Source: Zimmer, 2007.

## NEARLY HALF OF OLDER WOMEN LIVE ALONE IN SOME EUROPEAN NATIONS

As older people become less likely to reside with their adult children, their proportion living alone increases, especially in developed countries (Grundy, 2001). The phenomenon of older people living alone is particularly salient in European Union member states (Figure 6-8). Around half of women aged 65 and over in Denmark, Slovakia, and Germany lived alone in 2001. Because older men are less likely than older women to be widowed, they are also less likely to live alone. In the ten European Union countries in Figure 6-8, the percentage of older men living alone ranged from 10 percent to 26 percent. That older women are more likely to live alone than older men also has been documented

in Bulgaria, the Czech Republic, Estonia, Finland, and Romania (De Vos and Sandefur, 2002). It is still relatively uncommon for older people in developing countries to live alone (Table 6-1).

A large amount of research has sought to understand the relationship between living alone and loneliness. The consensus is that living alone does not equate to loneliness, although the two may be related. Loneliness can be emotional (the lack of a specific, intimate relationship) or social (the lack of social integration and embeddedness) (van Tilburg, Havens, and Gierveld, 2004). In the European context, research suggests that loneliness increases with age but may not be due to aging per se. Rather, loneliness could be the result of weakened social integration due to increasing disability

and/or a reduction in social activity (Dykstra, van Tilburg, and Gierveld, 2005; and Jylha, 2004). Researchers caution that living with others does not preclude loneliness, and that a spouse or children do not necessarily provide stronger emotional companionship than friends. A longitudinal study of female nurses aged 60 to 72 in the United States found that, compared with those living with their spouse, women living alone were not more socially isolated and had better measures of cognitive health (Michael et al., 2001). Data from the English Longitudinal Study of Aging (Demakakos, Nunn, and Nazroo, 2006) indicate that older people who had children but did not feel close to any of them were more likely to feel lonely than people without children.



Table 6-1.

**Percent of People Aged 60 and Over Living Alone by Sex:  
Circa 2000**

Country	Survey year	Male	Female
<b>Africa</b>			
Benin .....	2001	9.0	11.7
Egypt .....	2000	3.9	13.1
Ethiopia .....	2000	1.6	8.6
Gabon .....	2000	12.3	9.9
Malawi .....	2000	8.4	13.9
Mali .....	2001	5.1	9.8
Rwanda .....	2000	4.4	8.1
Zambia .....	2001/2002	5.5	12.3
<b>Asia</b>			
Armenia .....	2000	3.8	12.1
Bangladesh .....	1999/2000	0.6	3.3
India .....	1998/1999	1.8	5.0
Nepal .....	2001	2.6	6.6
Philippines .....	1998	4.0	6.4
Turkey .....	1998	4.4	12.5
<b>Latin America/Caribbean</b>			
Colombia .....	2000	6.7	7.4
Dominican Republic .....	1999	6.4	5.9
Guatemala .....	1998/1999	4.6	7.8
Haiti .....	2000	8.3	8.6
Mexico .....	2000	7.2	9.6
Panama .....	2000	14.1	8.5
Peru .....	2000	8.1	9.2

Source: United Nations, Department of Economic and Social Affairs, 2005.

**SKIPPED-GENERATION  
HOUSEHOLDS ARE  
A FEATURE OF  
SUB-SAHARAN AFRICA**

The impact of the worldwide HIV/AIDS pandemic on older people has become the focus of a growing body of research (e.g., Knodel and Saengtienchai 2005; Zimmer and Dayton, 2003; and Knodel et al., 2007). The pandemic affects HIV/AIDS parents (i.e., older parents of adult children who die of AIDS) in multiple ways, including caregiving, coresidence, providing material support, fostering grandchildren, loss of children, and the community's reaction (Knodel, Watkins, and VanLandingham, 2002).

Sub-Saharan Africa is the region most seriously affected by HIV/

AIDS. The Joint United Nations Programme on HIV/AIDS estimated that 29.4 million of the 33.2 million people worldwide living with HIV/AIDS in 2007 lived in Sub-Saharan Africa (UNAIDS and World Health Organization, 2007). A study of 22 countries in the region, based on data from the Demographic and Health Survey program, examined variations in living arrangements of older people as well as changes over time (Zimmer, 2007). Of particular interest to this chapter is the skipped-generation household structure, where an older person or couple resides with at least one grandchild without the presence of middle-generation family members. Overall, about 14 percent of older people lived in a skipped-generation household in the early-to-mid 2000s

(Figure 6-9). Rural older people were more likely than their urban counterparts, and women were more likely than men, to live in a skipped-generation household.

The skipped-generation family structure is not new in Africa, as rural young adults have frequently migrated to urban areas for job opportunities and left young children behind in the care of their grandparents. Today, however, middle-generation adults are increasingly infected with HIV and die of AIDS, and thus the skipped-generation household increasingly consists of the parents of people with HIV/AIDS and their grandchildren. When they are the only adults in the household, older people shoulder the financial and emotional responsibility of raising their grandchildren, often with meager resources (Ferreira, 2004).

Table 6-2 indicates the association between HIV/AIDS deaths and the skipped-generation household living arrangement. Older people living in countries with higher cumulative crude death rates due to HIV/AIDS generally are more likely to live in a skipped-generation household or a household where the resident grandchildren have lost both parents (such children are sometimes called double orphans). The 22-nation study also found that over the period of a decade, the increase in the proportion of older adults living with their double-orphaned grandchild was higher in countries that have higher HIV/AIDS prevalence. The patterns confirm that HIV/AIDS deaths often require grandparents to care for their orphaned grandchildren.

Table 6-2.

### Cumulative Crude Death Rate Due to AIDS and Living Arrangements of People Aged 60 and Over in 22 Sub-Saharan African Countries: Circa 2003

Country	Year of DHS survey	Cumulative crude death rate <sup>1</sup>	Percent living in a skipped-generation household	Percent living in a double-orphaned household
Madagascar .....	2004	1.1	18.9	2.4
Senegal .....	2005	3.1	8.3	1.2
Benin .....	2001	4.8	11.2	0.4
Mali .....	2001	7.8	9.1	1.2
Guinea .....	2005	8.2	10.3	1.5
Gabon .....	2000	11.0	9.2	0.4
Nigeria .....	2003	14.1	8.6	0.5
Ghana .....	2003	15.7	16.0	0.7
Chad .....	2004	15.8	12.1	1.4
Namibia .....	2000	21.2	22.1	2.8
Cameroon .....	2004	23.2	12.6	1.1
Ethiopia .....	2005	27.6	14.0	2.5
Burkina Faso .....	2003	33.5	7.5	1.0
Rwanda .....	2005	42.4	25.1	7.7
Mozambique .....	2003	43.3	18.1	1.9
Congo .....	2005	44.7	9.8	2.2
Kenya .....	2003	45.0	18.3	3.8
Tanzania .....	2004	50.8	16.4	2.1
Malawi .....	2004	76.9	30.1	8.1
Lesotho .....	2004	78.0	26.5	6.9
Uganda .....	2001	87.9	26.0	7.0
Zambia .....	2001	91.0	21.7	8.1

<sup>1</sup> Cumulative crude death rates are estimates of the total number of deaths ever occurring in a country due to AIDS expressed per 1,000 individuals living in the country in the year of the Demographic and Health Survey (DHS).

Source: Zimmer, 2007.

### USE OF LONG-TERM CARE FACILITIES VARIES BY SOCIAL GROUP

Although there is no universal definition, long-term care facilities usually include nursing homes, assisted living/residential care facilities, and sometimes hospice centers. The need for long-term care usually is most acute and most concentrated during the period of frailty associated with advanced old age (Leung, 2000). Women and the oldest old are likely to be overrepresented among long-term care residents. Residential aged-care data from Australia show that in 2007, 71 percent of all such residents were women and 54 percent were aged 85 and over (Australian Institute of Health and Welfare, 2008). Institutional use is also associated with marital status, prior living arrangements, older people's health,

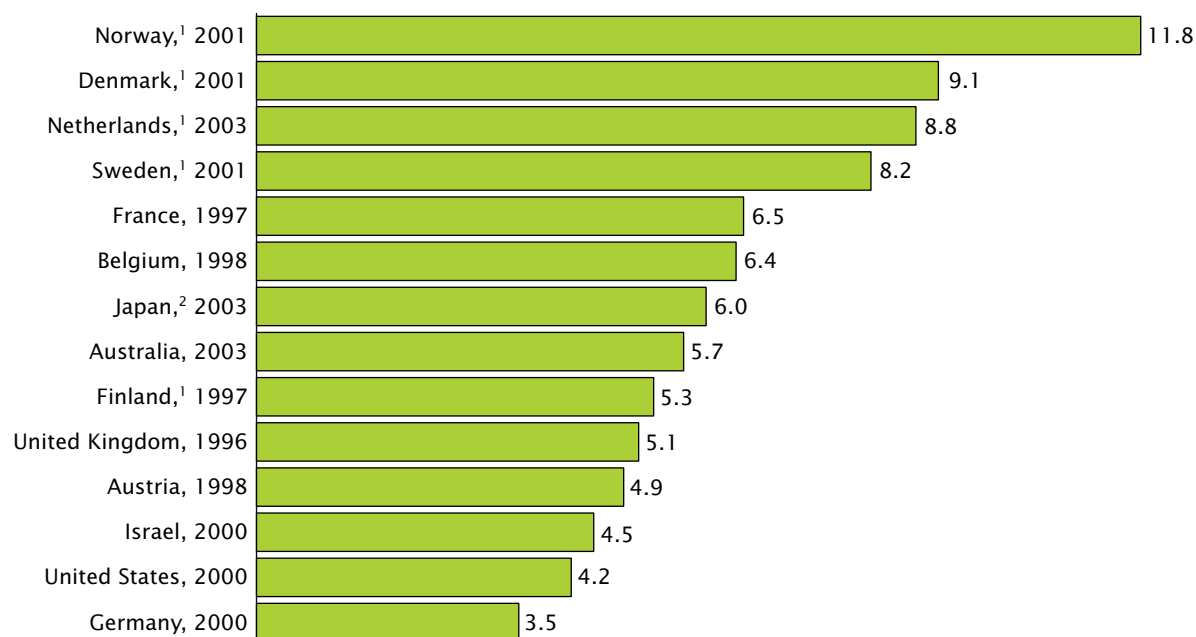
and the economic resources of older people and their adult children. A longitudinal study in England and Wales linked records of the surviving sample of community-dwelling people aged 65 and over in 1991 who had moved into institutional care by 2001 (Grundy and Jitlal, 2007). The results showed that older age, living in rented housing, living alone in 1991 and being unmarried in 2001, and long-term illness were the main sociodemographic factors contributing to institutionalization. Among women, being childless also was a factor. Similar findings were reported by an earlier study in the United Kingdom (Hancock et al., 2002). Studies in Canada and France also found caregiver burden (a term used to describe the physical, emotional, and financial toll of providing care) to be an independent factor associated with the institutionalization

of older people with dementia or Alzheimer's disease (Hebert et al., 2001; and Soto et al., 2006).

Institutional residence has become an option for older people in developed countries who have difficulties with activities of daily living or who require specialized medical services. Some nations have universal systems of long-term care for their older populations (and for younger people with disabilities), and Japan requires mandatory long-term care insurance (International Longevity Center, 2006; and Lundsgaard, 2005). The highest rates of institutional use are seen in some of the world's demographically oldest countries. Crossnational comparisons of institutionalized populations are problematic due to the absence of internationally consistent data, but one attempt to collate reasonably

Figure 6-10.

**Percentage of People Aged 65 and Over in Institutions: Circa 2001**



<sup>1</sup> Netherlands and the Nordic countries include people in service housing.

<sup>2</sup> Japan includes people in long-stay hospitals.

Source: Gibson, Gregory, and Pandya, 2003.

comparative data on institutional living showed that the percentage of older people living in institutions in developed countries around the year 2001 ranged from 4 percent to 12 percent (Figure 6-10). More than 8 percent of people aged 65 and over in Norway, Denmark, the Netherlands, and Sweden were in various types of long-term care facilities. People in institutions at one point in time do not necessarily remain there and “age in place” indefinitely. Many older individuals who enter an institution eventually leave, and many make multiple transitions. Some national nursing home systems (e.g., the Netherlands) have well-developed rehabilitative programs that discharge a high proportion

of users back into the community, while other systems have relatively limited rehabilitative services.

Rates of institutionalization usually are low or negligible in the developing world (United Nations Department of Economic and Social Affairs, 2005), where social traditions and official decrees of filial and familial responsibility have discouraged debate about living arrangements of older people. Lately, however, a number of countries have recognized that even if the family retains much of the support function for older members, demographic and socioeconomic changes are straining this arrangement. Consequently, many developing nations have adopted new policies aimed at alleviating current

and anticipated problems (United Nations Department of Economic and Social Affairs, 2007a). Long-term care provision and/or homes for the aged have become increasingly accepted and common in countries—especially in Southeast Asia—where sustained fertility declines have led to rapid population aging and reduced the number of potential family caregivers. A number of researchers and medical practitioners (e.g., Chiu and Chiu, 2005; Mangone and Arizaga, 1999; and Phillips and Chan, 2002) have raised warnings about the increasing prevalence of dementia in developing countries and the attendant implications for long-term care.

## CHAPTER 7.

# Social and Family Support

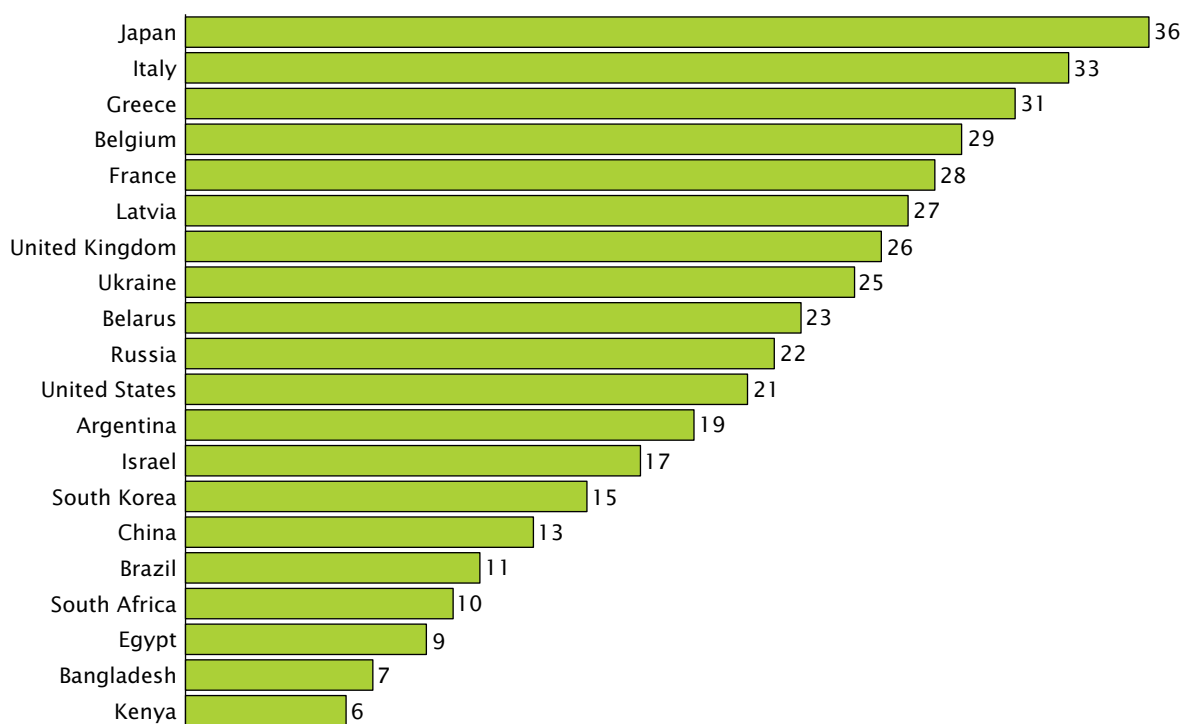
Population aging puts pressure on a society's ability to support its older members, who may compete with the young for resources, especially when the ratio between the working-aged population and the older population becomes low. The statistics discussed in the first part of this chapter may be seen as broad indicators of how changing national age distributions could affect the need for social services, housing, and consumer products for older people.

### SOME COUNTRIES HAVE JUST THREE WORKING-AGED PEOPLE PER ONE OLDER PERSON

A commonly used indicator of societal support is a dependency ratio, the ratio between youth and/or older people and working-aged people. Herein, the older dependency ratio (ODR) is defined as the number of people aged 65 and over per 100 people aged 20 to 64. Not surprisingly, countries with high percentages of people aged 65 and

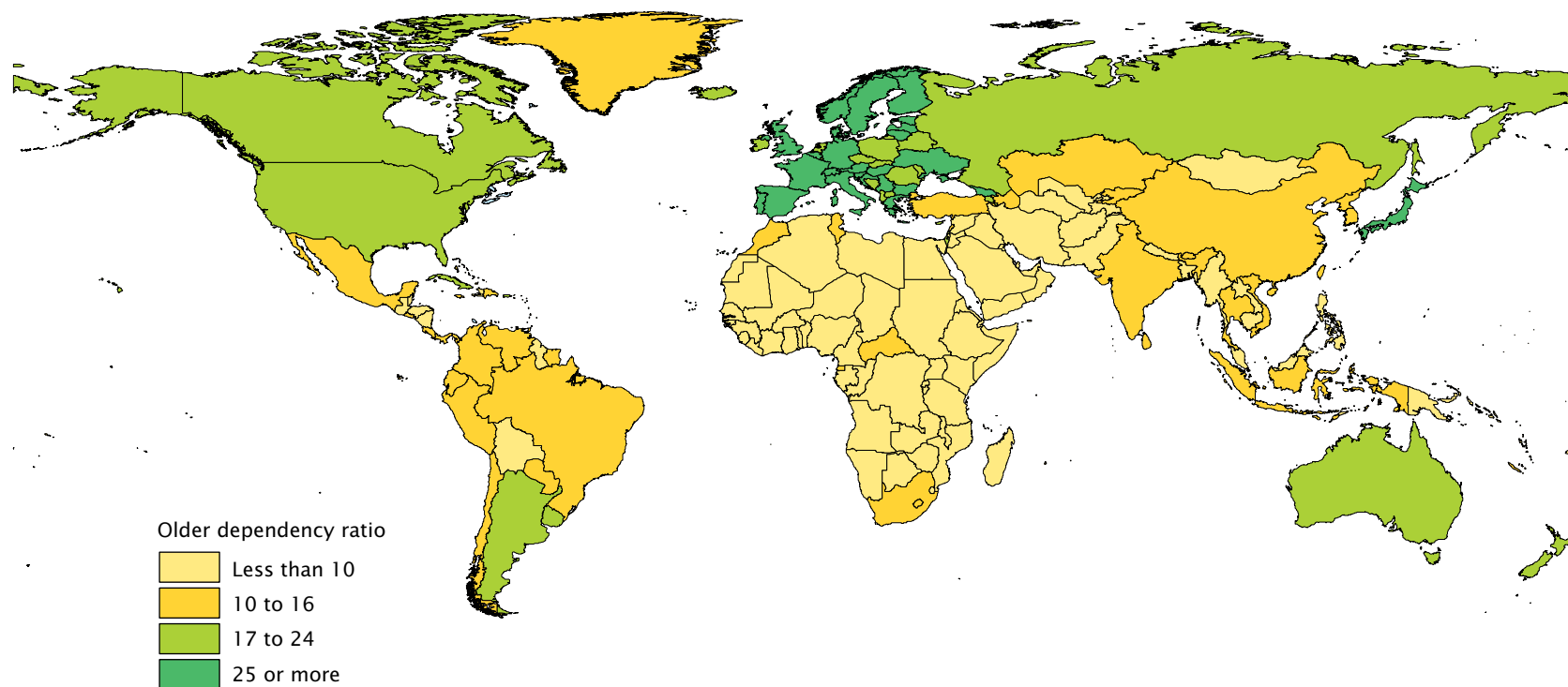
over tend to have the highest ODRs (Figure 7-1). Among the 52 study countries in this report, the ODR in 2008 ranged from 6 in Kenya and Uganda to 36 in Japan. Japan's ODR of 36 means that fewer than three working-aged people aged 20 to 64 supported one older person in 2008. Figure 7-2 presents a global view of older dependency ratios in 2008. The highest ODRs are seen in Western and some Eastern European countries and Japan. In contrast, the ODR is less than

Figure 7-1.  
**Older Dependency Ratio for 20 Countries: 2008**  
(People aged 65 and over per 100 people aged 20 to 64)



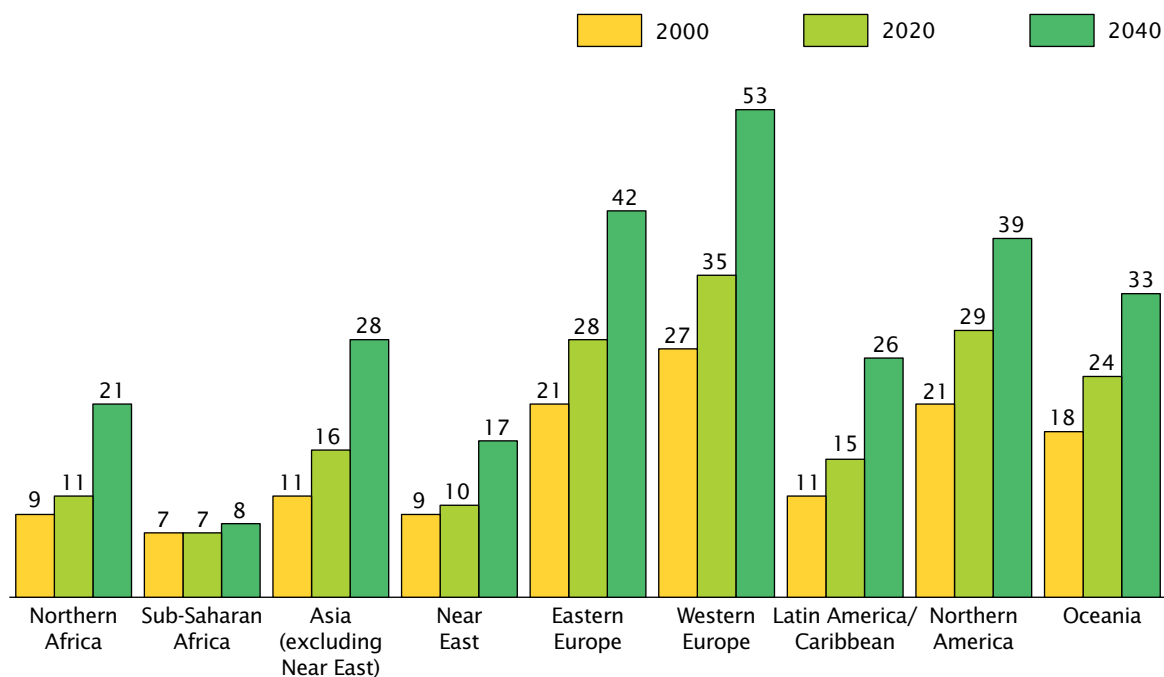
Source: U.S. Census Bureau, International Data Base, accessed on January 10, 2008.

Figure 7-2.

**Older Dependency Ratio: 2008**

Note: Older dependency ratio is the number of people aged 65 and over per 100 people aged 20 to 64.  
Source: U.S. Census Bureau, International Data Base, accessed on May 27, 2008.

Figure 7-3.

**Older Dependency Ratio for World Regions: 2000, 2020, and 2040**

Note: Older dependency ratio is the number of people aged 65 and over per 100 people aged 20 to 64.

Source: U.S. Census Bureau, International Data Base, accessed on January 10, 2008.

Table 7-1.  
**Total, Older, and Youth Dependency Ratios for World Regions: 2008**

Region	Total dependency ratio <sup>1</sup>	Older dependency ratio	Youth dependency ratio
Northern Africa .....	82	9	73
Sub-Saharan Africa .....	131	7	124
Asia (excluding Near East) .....	73	12	61
Near East .....	89	9	80
Eastern Europe .....	57	23	34
Western Europe .....	65	29	35
Latin America/Caribbean .....	78	12	67
Northern America .....	66	21	45
Oceania .....	73	19	55

<sup>1</sup> The total dependency ratio is the number of people aged 0 to 19 and 65 and over per 100 people aged 20 to 64. It is composed of the older dependency ratio, which is the number of people aged 65 and over per 100 people aged 20 to 64, and the youth dependency ratio, which is the number of people aged 0 to 19 per 100 people aged 20 to 64. Figures may not sum to totals due to rounding.

Source: U.S. Census Bureau, International Data Base, accessed on January 10, 2008.

10 in a large majority of countries in Africa and southern Asia. Projections suggest that the ODR for Europe as a whole will double from 24 in 2000 to 48 by 2040, implying that the ratio of workers to older people could be only 2 to 1 in three decades' time. At the other end of the spectrum, the predicted relatively high fertility, coupled with the impact of HIV/AIDS, in Sub-Saharan Africa will likely preclude a major change in the regional ODR (Figure 7-3).

Box 7-1.

## Standard and Alternative Older Dependency Ratios

Implicit in the standard definition of an older dependency ratio is the notion that all people over age 64 are no longer working and, in some sense, are dependent on the population in the working ages (20 to 64 years) who provide indirect support to older people through taxes and contributions to social welfare programs. However, not all older people require support, and not all working-aged people actually work or provide direct support to older family members. Older populations are diverse in terms of resources, needs, and abilities. Older people pay taxes and often have income and wealth that fuel economic growth. As discussed in Chapter 9, labor force participation rates at ages 65 and over have been increasing in many countries.

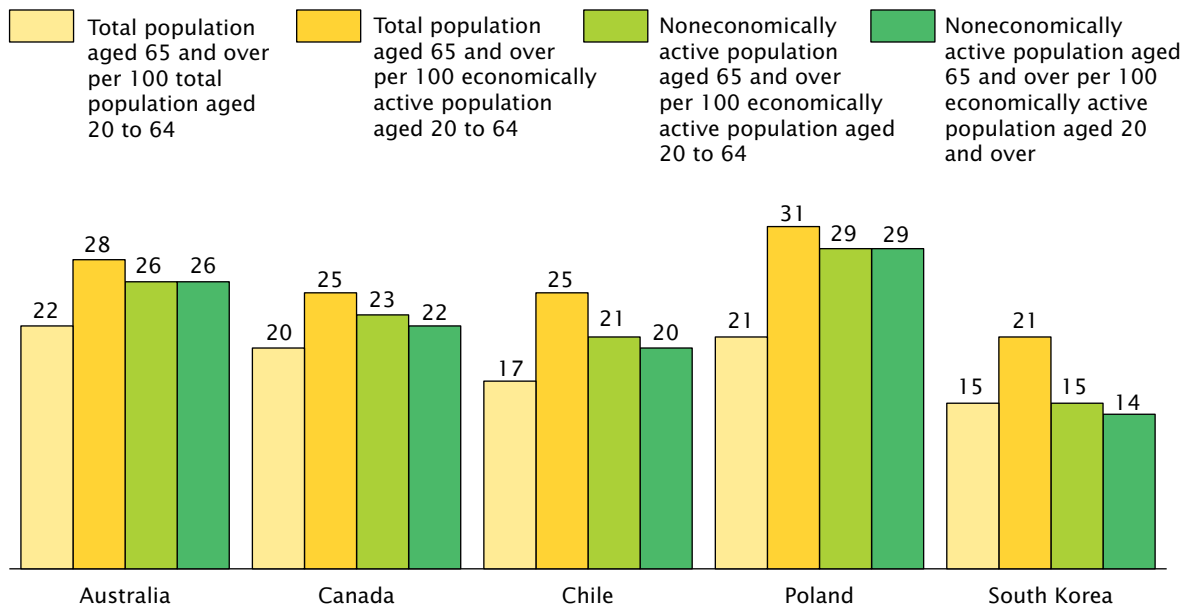
While it is empirically difficult to include factors such as intrafamily financial assistance and child-care activities in an aggregate measure of social support, it is feasible to take account of employment characteristics in both the working-aged and older populations. In Figure 7-4, the left bar for each country corresponds to the standard older dependency ratio

as defined above. The second, third, and fourth bars represent alternative older dependency ratios. The second bar includes only the economically active population aged 20 to 64 in the denominator, excluding such categories as unpaid household workers, nonworking students, discouraged workers, and perhaps individuals whose health status keeps them out of the labor force. The third bar represents a calculation similar to the second bar but removes economically active people aged 65 and over from the numerator on the assumption that they are not economically dependent. The fourth bar builds on the third bar by adding these economically active older people to the ratio denominator of other economically active individuals on the assumption that these working older people contribute tax revenue to national coffers. By taking into consideration the status of economic activity, alternative dependency ratios may provide a clearer picture of a society's support burden.

The alternative ratios in each country are higher than the standard ratio, even when the calculations

Figure 7-4.

### Standard and Alternative Older Dependency Ratios for Five Countries: 2006



Source: International Labour Organization, <<http://laborsta.ilo.org>>, accessed on February 6, 2008.

Box 7-1.

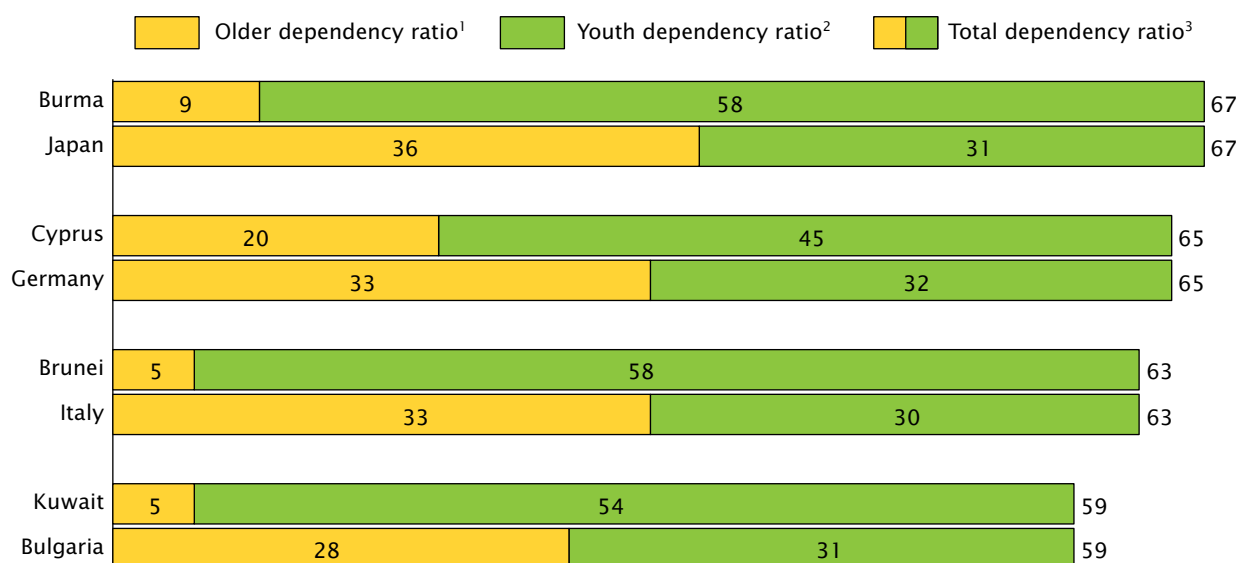
### Standard and Alternative Older Dependency Ratios—Con.

include noneconomically active older people in the numerator and economically active older people in the denominator (the fourth bar). The exception is South Korea, where older people have a relatively high rate of labor force participation. To the extent that policy and program agencies use dependency ratio calculations, the effect of including or excluding labor force participation rates appears considerable in most countries. Data permitting, other adjustments might be made to these ratios to account

for factors such as workers under age 20, trends in unemployment, average retirement ages, levels of pension receipt and institutionalization among the older population, and the prevalence of high-cost disabilities. While standard older dependency ratios provide us with a rough idea of changing demographics, changes in government policies and people's behavior (e.g., propensities to save throughout a lifetime or to work at older ages) will affect the impact of demographic change.

Figure 7-5.

### Composition of Total Dependency Ratios for Selected Countries: 2008



<sup>1</sup> Older dependency ratio is the number of people aged 65 and over per 100 people aged 20 to 64.

<sup>2</sup> Youth dependency ratio is the number of people aged 0 to 19 per 100 people aged 20 to 64.

<sup>3</sup> Total dependency ratio is the number of people aged 0 to 19 and 65 and over per 100 people aged 20 to 64. Youth and older ratios may not sum to total ratio due to rounding.

Source: U.S. Census Bureau, International Data Base, accessed on February 6, 2008.

### ELEMENTS OF THE TOTAL DEPENDENCY RATIO REFLECT AGE STRUCTURE AND SUPPORT NEEDS

Nonworking older people are not the only group a society's working population needs to support. A nation's young are the other half of the equation. The total dependency

ratio (TDR) is an indicator of society's total support needs. The TDR combines the ODR with a youth dependency ratio (YDR), defined in this report as the number of people aged 0 to 19 per 100 people aged 20 to 64.<sup>1</sup> Looking at world regions

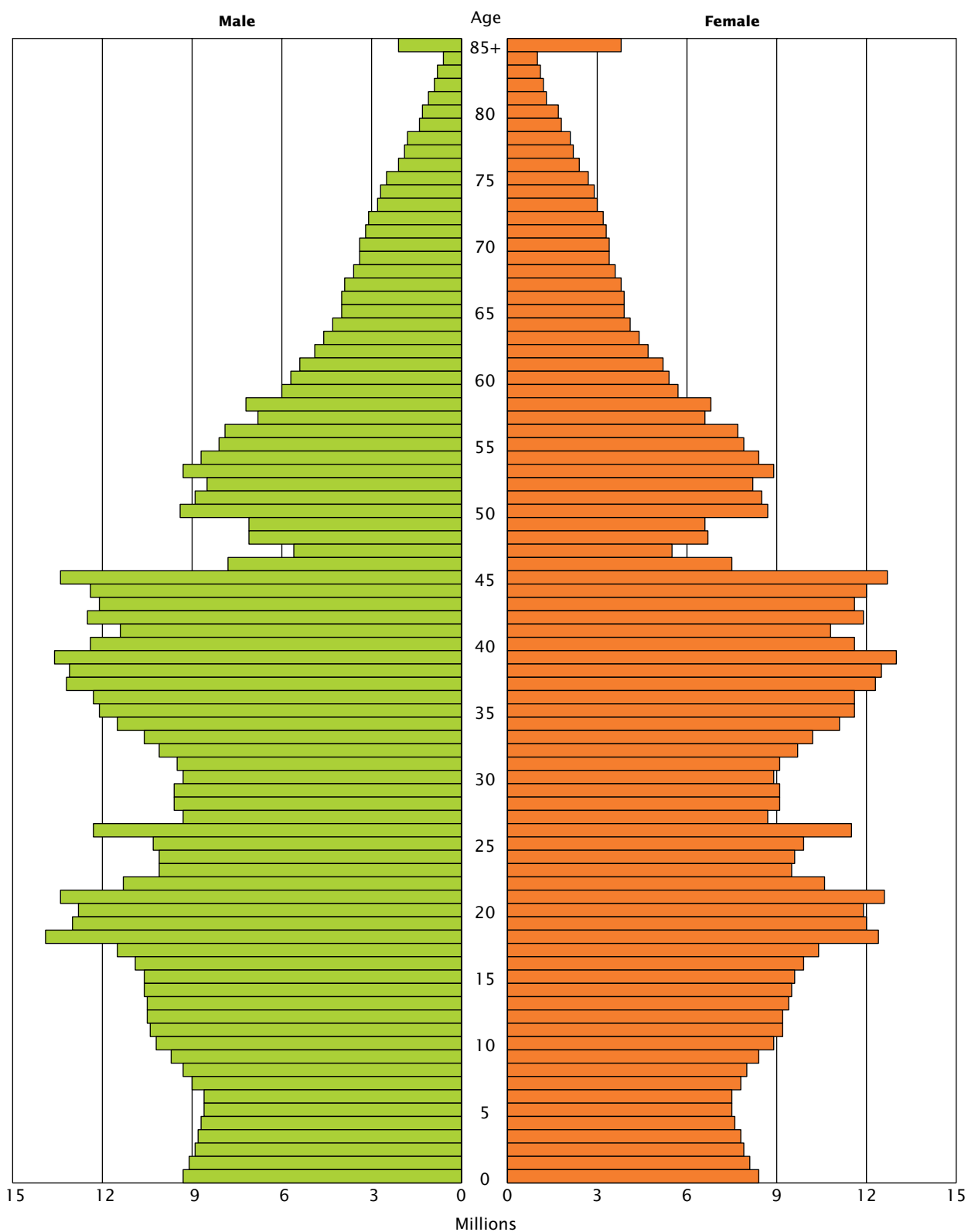
<sup>1</sup> Older, youth, and total dependency ratios in 2000, 2020, and 2040 are presented for the 52 study countries in Appendix Table B-7.

in 2008, Sub-Saharan Africa stands out with a TDR of 131, indicating that the total of younger and older people exceeded the number of working-aged people (Table 7-1).

Eastern Europe had the lowest TDR (57) among world regions in 2008. More than 40 percent of Eastern Europe's "dependency" came from

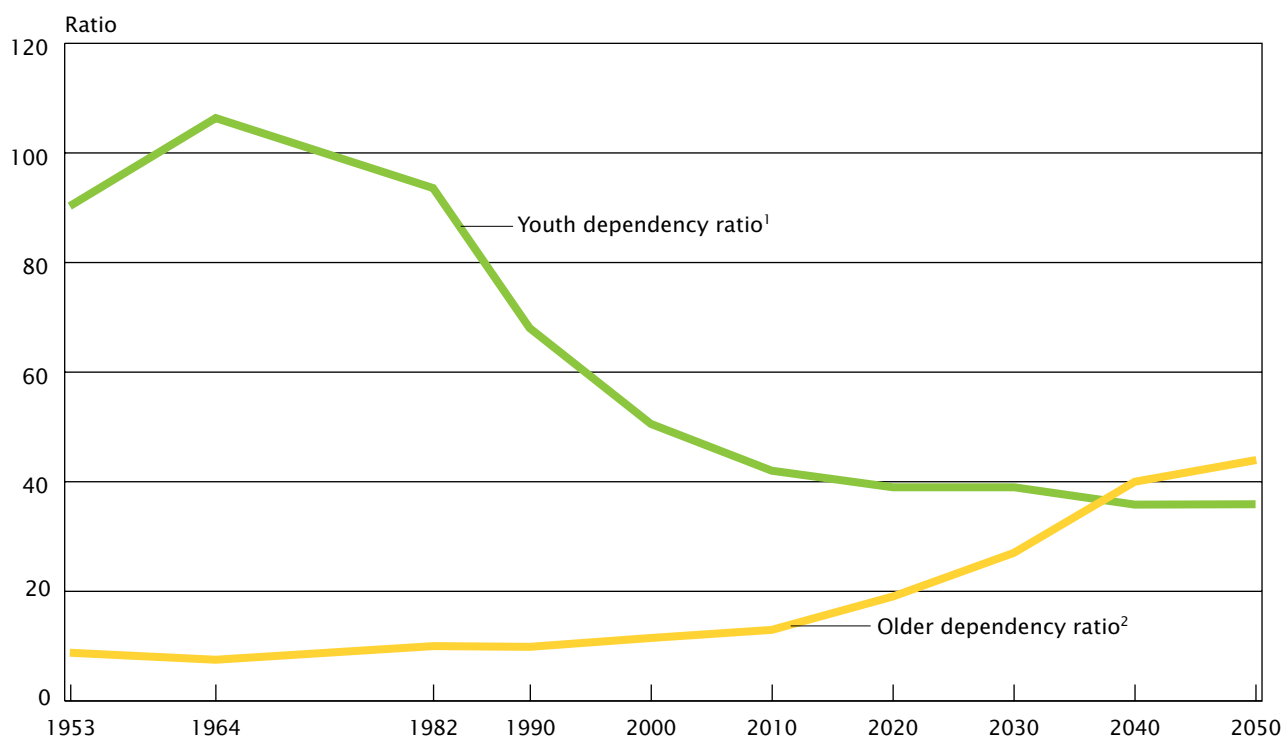


Figure 7-6.  
**Population for China by Single Year of Age and Sex: 2008**



Source: U.S. Census Bureau, International Programs Center special tabulations.

Figure 7-7.  
**Youth and Older Dependency Ratios in China: 1953 to 2050**



<sup>1</sup> Youth dependency ratio is the number of people aged 0 to 19 per 100 people aged 20 to 64.

<sup>2</sup> Older dependency ratio is the number of people aged 65 and over per 100 people aged 20 to 64.

Sources: For 1953, 1964, 1982, 1990, and 2000, China census data; for 2010 to 2050, U.S. Census Bureau, International Data Base, accessed on February 6, 2008.

older age groups (ODR of 23), compared with less than 6 percent for Sub-Saharan Africa (ODR of 7). The compositional differentials reflect highly different age structures that have distinct implications for societal support. Figure 7-5 presents four pairs of countries with identical TDRs but different youth/older compositions. For example, both Burma and Japan had a total dependency ratio of 67 in 2008; but for Japan, more than half of the ratio resulted from the size of the older population, while for Burma, 87 percent was due to youth and children.

### CHINA'S SHIFTING AGE COMPOSITION ALTERS DEPENDENCY RATIOS

The situation in China illustrates the impact of low fertility on a

country's age structure and population aging. China started a nationwide family planning program in the 1970s and began implementing the one-child-per-couple policy in 1979, aimed at curbing growth in the world's most populous nation (Lee and Feng, 1999). While the policy was relaxed somewhat in subsequent years, China's total fertility rate declined from 5.8 in 1950, to 2.7 in 1979, to under the replacement level in 1991 (2.0), and it has remained below replacement since then (He et al., 2007). The impact of the fertility decline can be seen in China's age and sex profile in 2008 (Figure 7-6). The base of the population pyramid is smaller than the middle age groups. The indentation at ages 27 to 31 reflects small birth cohorts at

the initiation of the family planning policy.<sup>2</sup> The large bulge of people aged 37 to 45 represents those who were born after the great famine in the early 1960s and before the family planning policy started, and these people will be entering their sixties around 2025. Population momentum will produce a rapid aging of the Chinese population in the third and fourth decades of this century. By then, it is projected that China's older dependency ratio and youth dependency ratio will have converged (Figure 7-7), and we may anticipate a society and economic fabric that are quite different from those of today. As population aging proceeds, one concern that

<sup>2</sup> Another sharp indentation at ages 47 to 49 reflects extremely low fertility resulting from the great famine in the early 1960s.

is increasingly voiced has to do with the growth of China's labor force. The success of birth control measures means that the growth of China's labor force may soon cease; in fewer than 10 years, the size of the labor force will likely begin to decline, and one of the basic advantages of China's economic development may atrophy (Cai and Wang, 2006).

China's changing age structure also gives rise to concerns about whether family members will be available for older people's care. Without siblings to share the responsibility, young couples born since the one-child policy often are shouldering the task of taking care of four older parents. The children of today, if the current one-child policy continues to the time of their marriage in 20 years, could face the task of taking care of four parents and as many as eight grandparents. Some researchers (e.g., Zimmer and Kwong, 2003) argue that overall reductions in family support may be less drastic than anticipated. Nevertheless, there is a general concern that the extensive reduction in family size, coupled with rural-urban migration that draws young people to work in cities, will result in fewer caregivers for aging parents and an undermining of the traditional family support system (Du and Guo, 2000; and Silverstein, Cong, and Li, 2006).

### **ADULT CHILDREN ARE THE MAIN PROVIDERS OF SUPPORT TO OLDER PEOPLE**

China is not alone in facing the challenge of caring for older people. The limited number of family members available for old age care will be felt in countries where fertility has declined rapidly and where the family is the preeminent provider of old age support. Families, and especially adult children, are still the primary

source of support and care for older people in most countries. In South Korea, for example, most older people needing assistance with basic activities of daily living are cared for by family members, typically daughters-in-law. Barely 1 percent of South Koreans aged 65 and over in 2002 received any type of public long-term care (Howe, Jackson, and Nakashima, 2007). Other studies in Asia show that 70 percent to 90 percent of older people received money or material goods from another person, almost all of which came from adult children (Biddlecom, Chayovan, and Ofstedal, 2002; and Cuong et al., 2000). Research on aging in Sub-Saharan Africa has documented that family support ensures economic security for older people in the absence of formal welfare systems. However, growing poverty and a reduced resource capacity of the middle generation can lead to a decline in such support, as in the case of Ghana (Aboderin, 2004).

Social structures in which family members are the main providers of support are not unique to developing countries. The European Study of Adult Well-Being found that the family provides the bulk of support for older people in most European countries. Nonformal support comes primarily from a spouse and from adult children in the absence of a spouse (Burholt et al., 2003). In Southern European nations (Greece, Italy, Portugal, and Spain), the extended family plays more of a role in caring for aging parents than is the case in Northern Europe (Scharf et al., 2003; and Burholt et al., 2007).

Although many industrialized nations have high proportions of older people living alone, data from the first wave of the Survey of Health, Ageing and Retirement in Europe (SHARE) suggest that

people generally prefer "intimacy at a (small) distance" (Kohli, Kunermund, and Ludicke, 2005). In other words, people prefer that the distance between adult children and older parents is small enough so that exchange and support may easily happen across the boundaries of separate households. In most SHARE countries, about 20 percent of people aged 80 and over with at least one living child had a child living in their neighborhood (less than 1 kilometer away) and at least another 30 percent had a child living within 1 to 25 kilometers, except in Austria and Spain (Figure 7-8). The percentages for having a child within 25 kilometers were 65 percent to 80 percent in France, Denmark, Sweden, and the Netherlands. When one looks at these data, the picture of older people living alone does not necessarily suggest isolation.

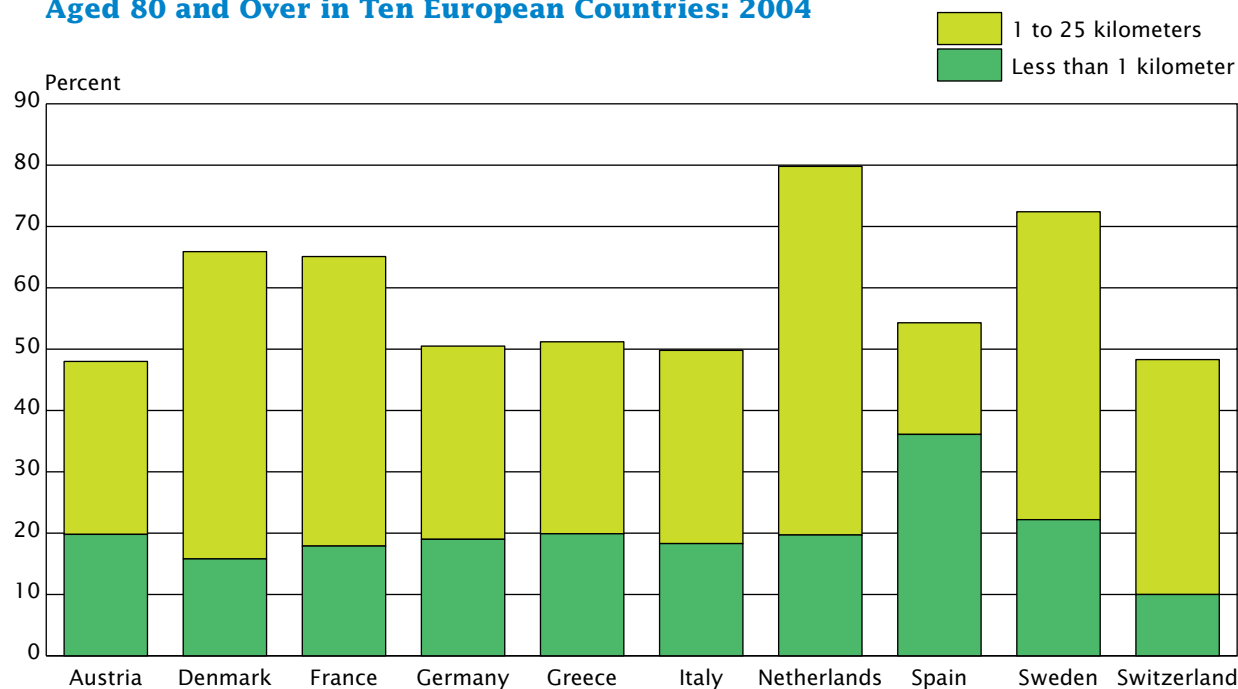
### **PROPORTIONS OF CHILDLESS OLDER PEOPLE MAY RISE IN THE FUTURE**

Not all older people have children to support them. Childlessness is another factor that may affect the nature of future care receipt, but it has received relatively little attention in most countries. Childlessness has distinctive regional and historical patterns associated with demographic and nondemographic factors. Fertility, nuptiality, morbidity, infant mortality, and migration all play a role in childlessness; in addition, education, women's work, urban-rural residence, and lifestyle preferences are strongly associated with reproductive decisions (Hakim, 2003; Schroder-Butterfill and Kreager, 2005; and Spielauer, 2004).

Figure 7-9 shows the percent childless among women aged 65 in 2005 (born in 1940) in Europe and the United States, ranging from

Figure 7-8.

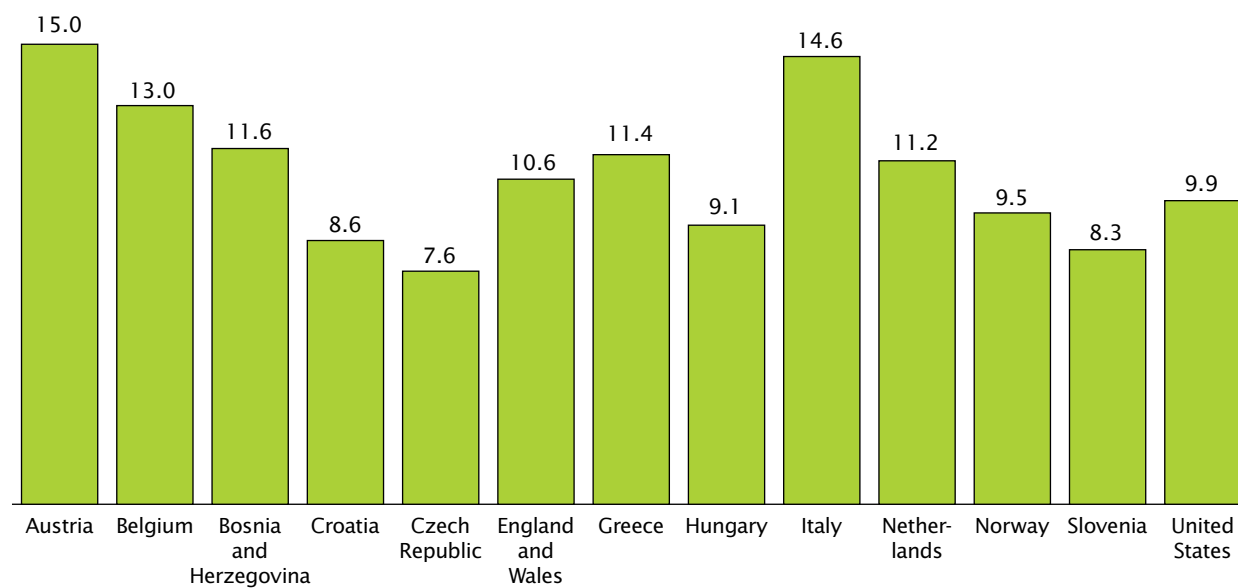
**Proximity to Nearest Living Child for People Aged 80 and Over in Ten European Countries: 2004**



Source: Kohli, Kunemund, and Ludicke, 2005.

Figure 7-9.

**Percent Childless Among Women Aged 65 in Selected Countries: 2005**



Source: Billari, 2005.

less than 8 percent in the Czech Republic to 15 percent in Austria and Italy. However, this snapshot in time is only part of the story. In many Western countries, proportions of childless women are higher in cohorts born early in the twentieth century than in cohorts born 30 or so years later. The generations born between World War I and World War II had relatively higher rates of marriage and lower rates of childlessness, so that proportions childless among today's older populations often are declining. This trend suggests that in the next two to three decades, the potential child support available to older people in many developed nations will increase (Grundy, 2009). One three-nation analysis found that during this time period, the proportion of older people having a surviving child is likely to be higher than among any generation ever born in Britain, Finland, and France (Murphy, Martikainen, and Pennec, 2006).

On the other hand, the longer-term trend is less favorable—childlessness among more recent cohorts (born after World War II) has been increasing. Studies of the 1959 birth cohort in Britain and the 1960 cohort in Western Germany have documented high levels of childlessness, about 1 woman in 5 (Simpson, 2006; and Basu, 2002). In the United States, the percentage of women who are childless at ages 40 to 44 has been rising. The figure was 10 percent in 1970 and 1980 but increased to 16 percent in 1990 and to more than 20 percent by 2006. Permanent childlessness among younger age groups appears to be on the rise in Europe (Tanturri and Mencarini, 2008), and we may anticipate a similar trend in Latin America and Southeast Asia. Attitudinal research among younger (ages 18 to 39) European adults shows that more than one-third in Germany, the Netherlands,

Finland, and Poland either intend to remain or are uncertain about remaining childless (Sobotka and Testa, 2006).

Childlessness in many African countries is said to have been common before the late 1960s due to high levels of infertility associated with the prevalence of sexually transmitted diseases (White et al., 2001). Estimates of primary infertility (never having given birth) ranged from 10 percent to 20 percent. National surveys from the 1990s suggested that levels of primary infertility had dropped to less than 5 percent in most countries, largely as a result of widespread adoption of antibiotics. Given the variation in family structure worldwide, it will be increasingly important to understand different types of childlessness (e.g., voluntary, involuntary “coerced,” involuntary “natural,” and loss of children due to HIV/AIDS) and the implications for eventual care arrangements as current and future cohorts of middle-aged people reach older age (Kreager and Schröder-Butterfill, 2004; and Dykstra and Hagestad, 2007).

### **HOME HELP SERVICES REDUCE THE NEED FOR INSTITUTIONALIZATION**

Chapter 6 noted that institutional residence is one care option for older people. Since the 1980s, social and governmental thinking (at least in Western countries) about the desirability of institutionalization has changed. Most member nations of the Organisation for Economic Co-Operation and Development (OECD) have encouraged more home- and community-based care as an alternative to institutional care, and rates of institutionalization have been dropping (Gibson, Gregory, and Pandya, 2003). Denmark, for example, relied heavily on institutional care in the early 1980s, but between

1982 and 1996, the proportion of people aged 80 and older who lived in nursing homes decreased from 20 percent to 12 percent.

Given the changes in family structure and kin availability, home help services reduce the need for institutionalization. Figure 7-10 shows that the proportions of the older population receiving formal in-home help in the late 1990s and early 2000s vary widely by country. Such services reach one-fourth of the older population in Denmark and Austria but smaller proportions in some other countries with similar levels of population aging. Compared with OECD data for roughly one decade earlier, the prevalence of home help has increased in most of the countries shown in Figure 7-10. In the Netherlands in 2005, home care increased with increasing age until age 90; after that, the share of people receiving home help declined as proportionally more of the oldest population lived in nursing homes and other institutional facilities.

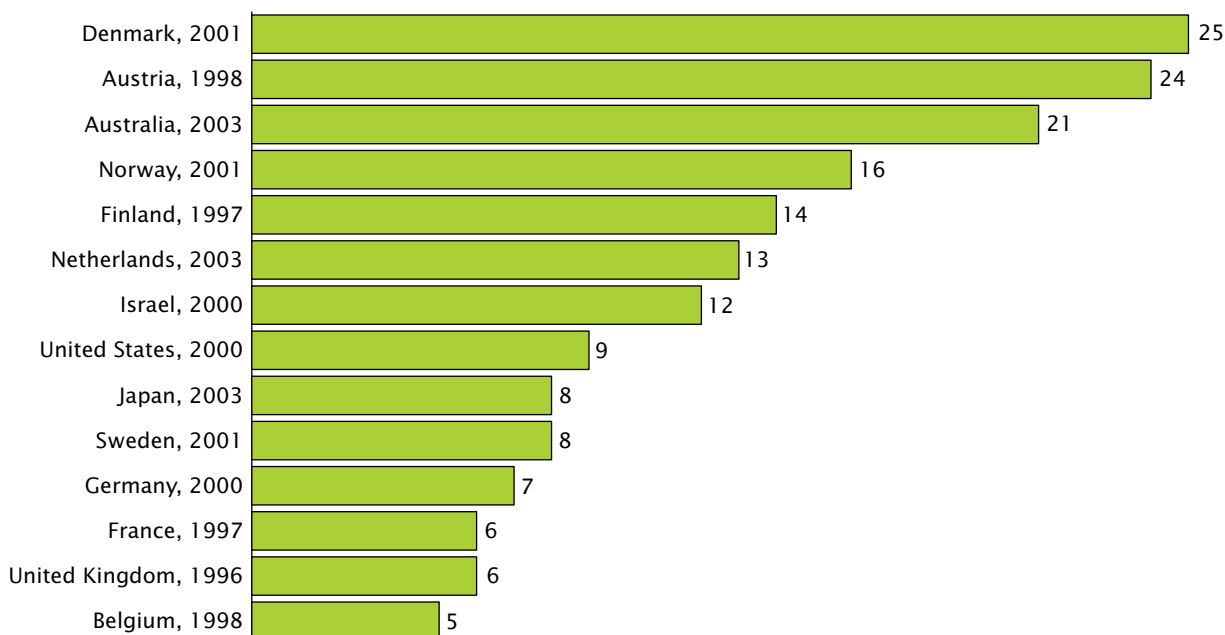
### **OLDER PEOPLE PROVIDE AS WELL AS RECEIVE SUPPORT**

Older people provide care for a variety of people (spouses, older parents, siblings, children, grandchildren, and nonfamily members) and do so for many reasons, including illness of a spouse or sibling and to assist single-parent families, working mothers, and orphaned grandchildren. Often the care provided by older family members is essential to the well-being of a family.

In countries with well-established pension and social security programs, many older adults also give other forms of support (including financial help, shelter, and the wisdom of experience) to their adult children and grandchildren. In Northern America, earlier studies

Figure 7-10.

**Percentage of Population Aged 65 and Over Receiving Formal Home Help in Selected Countries: Circa 2001**



Source: Gibson, Gregory, and Pandya, 2003.

(e.g., Soldo and Hill, 1993; and Rosenthal, Martin-Matthews, and Matthews, 1996) suggested that older parents were more likely to provide financial help than receive it. Data from the ongoing Health and Retirement Study (HRS) in the United States confirm that older parents are more likely to provide time, money and/or coresidence to their children than receive such transfers; the only exception is seen among unmarried HRS respondents aged 80 and over, who in 2002 were more likely to receive help than provide it (U.S. National Institute on Aging, 2007). A similar transfer pattern among older people up to age 75 was found in Britain (Grundy, 2005) as well as in other European countries. Analysis of 2004 data from the SHARE revealed that transfers

from older parents to children were much more frequent and substantial than those in the opposite direction, and the difference remained positive even though it declined with age (Albertini, Kohli, and Vogel, 2007).

Older people in developing countries appear relatively less likely than those in developed countries to provide financial help. High proportions of older people in Asia receive financial and material transfers from their children, while flows in the other direction are lower (Biddlecom, Chayovan, and Ofstedal, 2002). The Study on Aging, Health, and Well-Being in Latin America and the Caribbean found that older people who reside with an adult child receive about the same amount of aid as they give, while noncoresident older

people receive more than they give (Pelaez and Martinez, 2002). Beyond the financial realm, older people in developing countries make substantial contributions to family well-being in ways ranging from housekeeping to grandchild care and socialization. Such activities free younger adult women to help with family agricultural production (which may be unpaid) as well as pursue paid employment.

Understanding intergenerational transfers is now a major focus in aging research. In both developed countries and developing countries, studies have moved beyond the description of transfer patterns to areas such as the mapping of kinship and support networks (Hermalin, 2002; and Chan, 2005); generational reciprocity (Verbrugge and Chan, 2008);

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the effects of migration on old-age support networks (Kreager, 2006); the direction of wealth flows and how they may shift with changes in economic development (Lee, 2007); the introduction of age into national transfer accounts (Mason et al., 2006); and the interplay of aging, intergenerational transfers, and macroeconomics (Clark, Ogawa, and Mason, 2007).

### **GRANDPARENTING IS A PRIMARY ROLE IN MANY NATIONS**

Older people often contribute to their family by providing care for grandchildren, especially when the parents are working or studying (Tomassini, 2005). In countries with a high prevalence of HIV/AIDS, the role of older people (particularly women) as primary caregivers for children is expanding. In Sub-Saharan Africa, 30 percent of households are reported as being headed by a person aged 55 and over, and two-thirds of these households have at least one child under age 15 (United Nations Department of Economic and Social Affairs, 2007a). A crossnational study in Asia (Biddlecom, Chayovan,

and Ofstedal, 2002) found that 38 percent of all older adults in the Philippines and 23 percent in Taiwan cared for grandchildren, while among older people who lived with their grandchildren, 32 percent in Thailand and 70 percent in Singapore provided such care.

In the United States, descriptive studies have indicated the growing importance of the grandparent-grandchild care relationship. Census data for 2000 show that 42 percent of coresident grandparents had primary care-giving responsibility for their coresident grandchildren younger than 18. Among coresident grandparents, 55 percent of those aged 60 and over had cared for their grandchildren for 5 years or more, compared with 32 percent of those younger than 60 (Simmons and Dye, 2003). One study (Hughes et al., 2007) used six waves of longitudinal data from the HRS to examine different types of grandparent care-giving and changes in caregiver health. The researchers distinguished between grandparents who provided care to grandchildren who did not live with them and those whose

grandchildren lived with them. They determined that grandparents who provided a considerable amount of care to nonresident grandchildren did so because of desire and resources, while grandparents who resided with grandchildren often did so because some family crisis had made this a necessity. Children living in their grandparents' residence is relatively uncommon. In 1998, for example, 5 percent of HRS participants lived with grandchildren, mostly in three-generation households.

European grandparents in the SHARE are asked whether they regularly or occasionally look after their grandchildren. Data for ten countries from 2004 show that between 43 percent and 62 percent of grandmothers provided such care, with the highest levels in the Netherlands, Denmark, and Sweden. The most likely reason for the relatively high levels in Northern European countries is that grandmothers are helping their children to combine work and family commitments (Attias-Donfut, Ogg, and Wolff, 2005).

## Education and Literacy

Education is linked to many aspects of a person's well-being. People with higher education tend to have lower mortality rates and better overall health than their less-educated counterparts, as well as better cognitive functioning in older age. Part of the reason for this is that more-educated people tend to have higher incomes throughout their lifetime, which means they may be able to purchase a wider variety of health care than people with lower levels of education. Education also affects how effectively people utilize health care. Many studies attribute the education advantage to a combination of economic implications (e.g., better jobs and living conditions) and psychosocial influences related to healthy behavior,

nutritional status, and medical-treatment-seeking behavior.

### ATTAINMENT GAP BETWEEN DEVELOPED AND DEVELOPING REGIONS

The educational attainment of older people can differ substantially between developing and developed countries. Figure 8-1 shows that in 2005, half or more of the near-older population (aged 55 to 64) in 18 of 29 Organisation for Economic Co-Operation and Development (OECD) member states had completed secondary education or more, as had at least one-third in another five countries. The highest levels (79 percent or more) are seen in the Czech Republic, Germany, and the

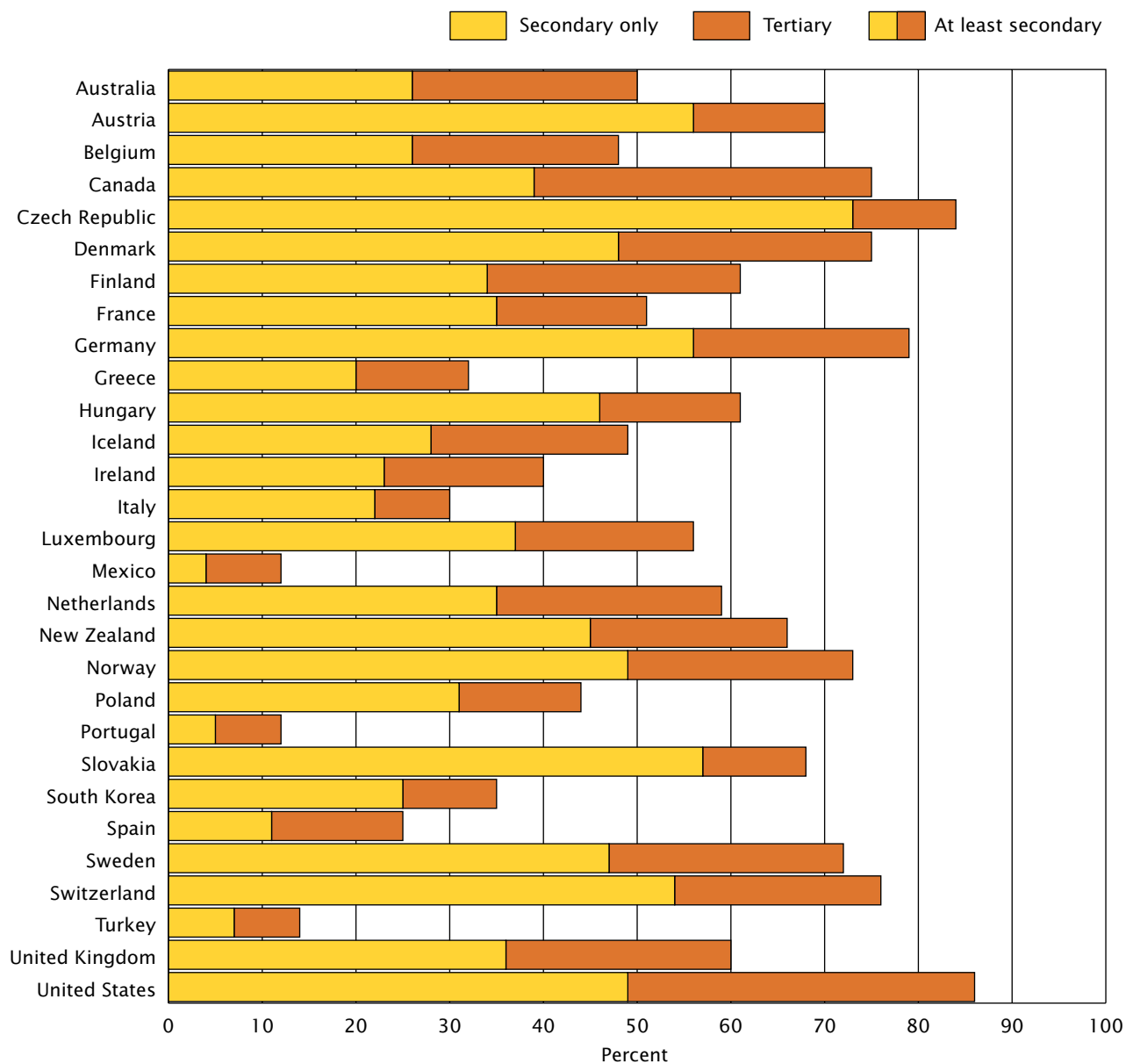
United States. More than one-third of people aged 55 to 64 in the United States and Canada also had completed tertiary education. In 13 other OECD countries, at least 1 in 5 of the near-older population had completed tertiary education.

Secondary-education completion levels in most developing countries were notably lower, and a large gender gap is observed at ages 55 to 64 in each of the countries in Figure 8-2 except Colombia. In the same set of countries, levels of completion at the secondary level for people aged 65 and over were generally about half of those for people aged 55 to 64. In some countries, less than 1 percent of older women had completed secondary school.



Figure 8-1.

**Percentage of People Aged 55 to 64 Who Have Completed Secondary and Tertiary Education in 29 OECD Countries: 2005**



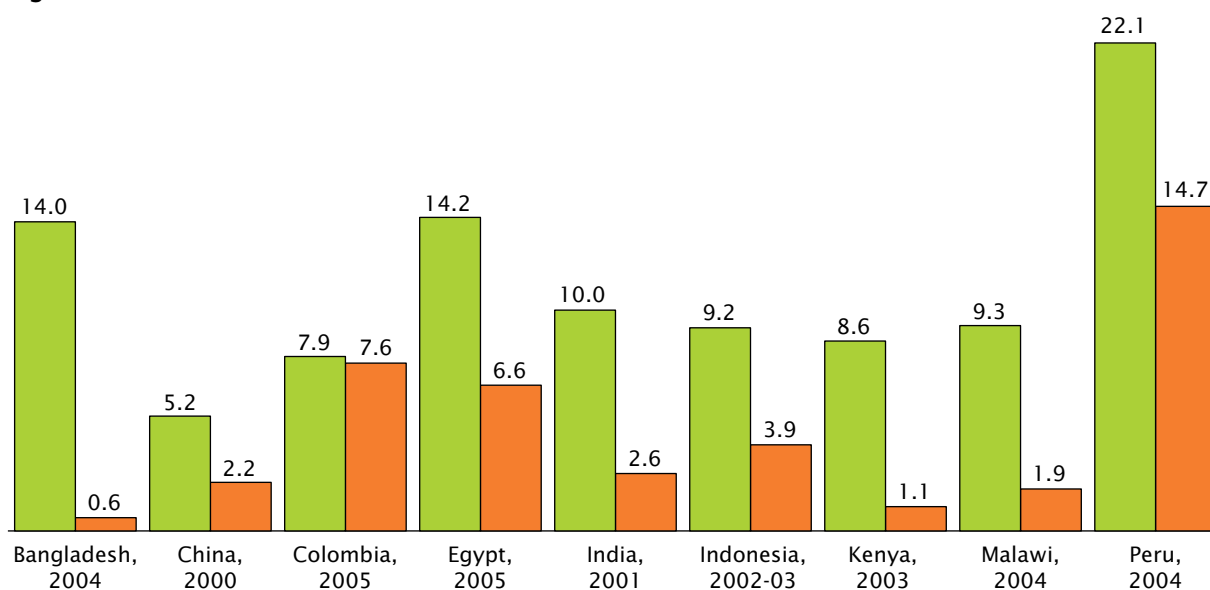
Source: Organisation for Economic Co-Operation and Development (OECD), 2007c.

Figure 8-2.

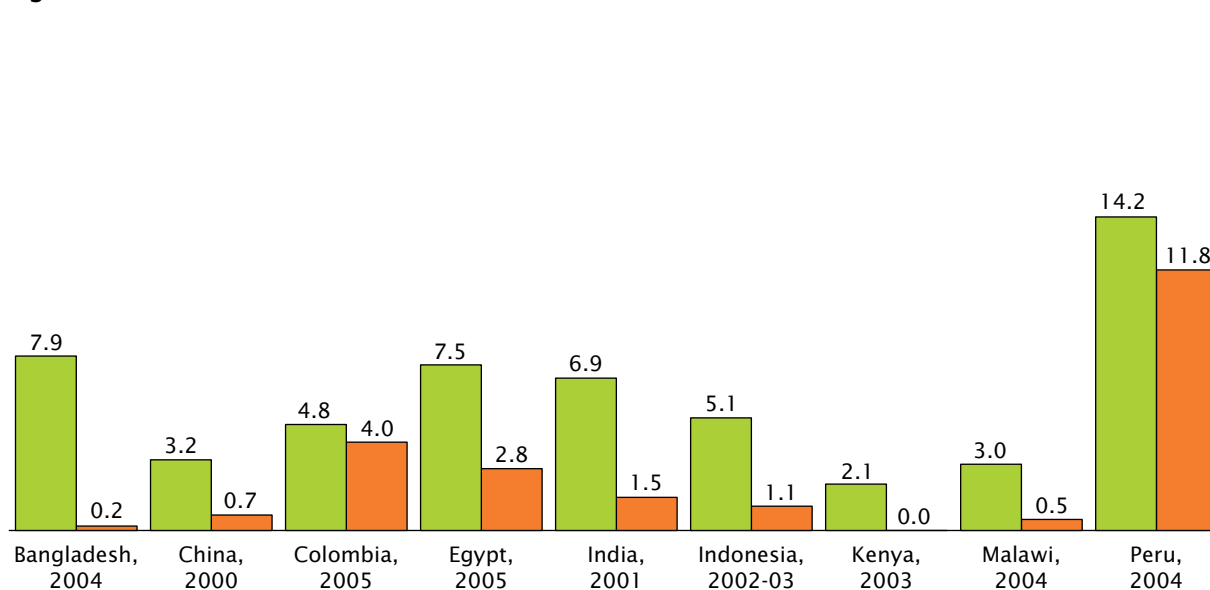
**Percentage of People in Two Age Groups Who Have Completed Secondary Education in Nine Developing Countries by Sex: Circa 2003**

Male Female

**Aged 55 to 64**



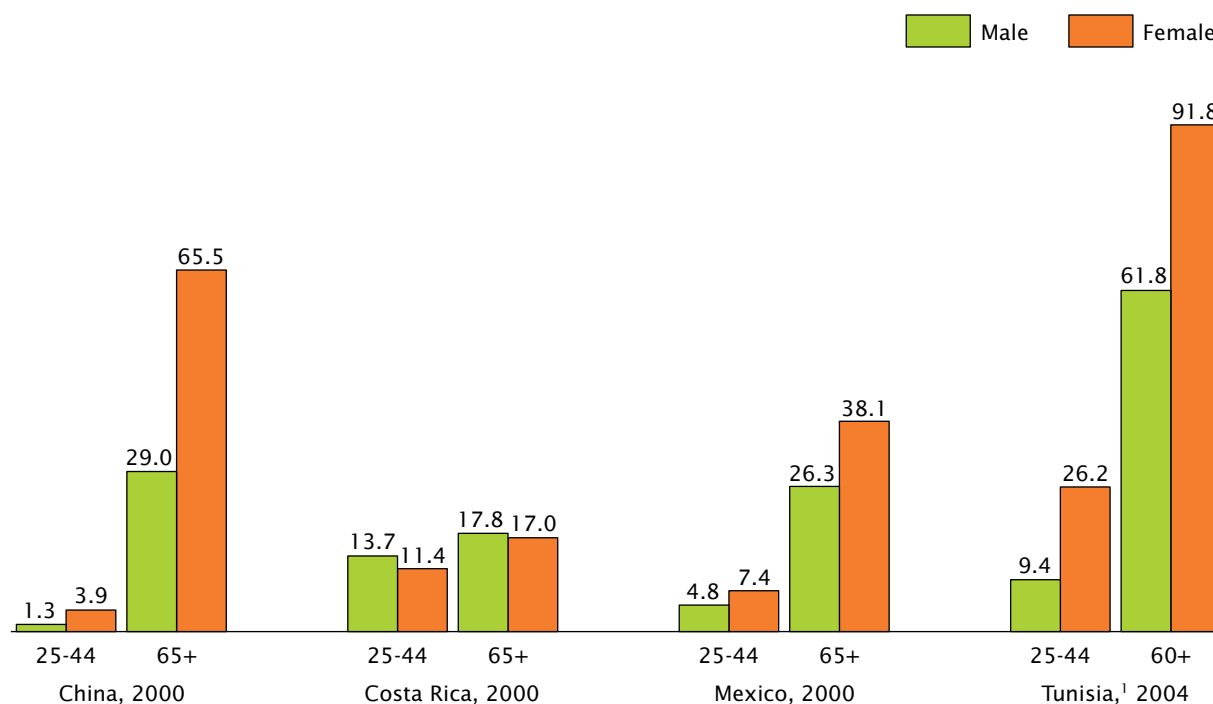
**Aged 65 and over**



Sources: National censuses and demographic and health surveys.

Figure 8-3.

### Percent Illiterate for Two Age Groups in Four Countries by Sex: Circa 2000



<sup>1</sup> Tunisia's older age group is 60 and over.  
Sources: National censuses.

### ILLITERACY AT OLDER AGES STILL COMMON IN DEVELOPING COUNTRIES

Illiteracy hinders older people's social participation and contribution to social development. People who do not read or write tend to work in low-paying jobs that likely offer few health and retirement benefits. Illiterate older people are often unaware of their rights and the benefits to which they are entitled, including social security benefits (United Nations Department of Economic and Social Affairs, 2007a).

Many of today's older people in developing countries lived much of their lives prior to the rapid increase in educational attainment that occurred there in the second half of the twentieth century.

Consequently, many older people, particularly older women, have low levels of literacy. On the basis of available information for 105 developing countries, the United Nations estimated that 56 percent of people aged 60 and over were illiterate in 2000 (United Nations Department of Economic and Social Affairs, 2002). China's 2000 census found that 66 percent of women and 29 percent of men aged 65 and over could not read and write (Figure 8-3). Census data for Tunisia show even higher illiteracy levels—92 percent of women and 62 percent of men—among the 60-and-over population.

In many developed countries, literacy data no longer are routinely collected because education, at least at the primary level, is so widespread that literacy is considered to be universal. However,

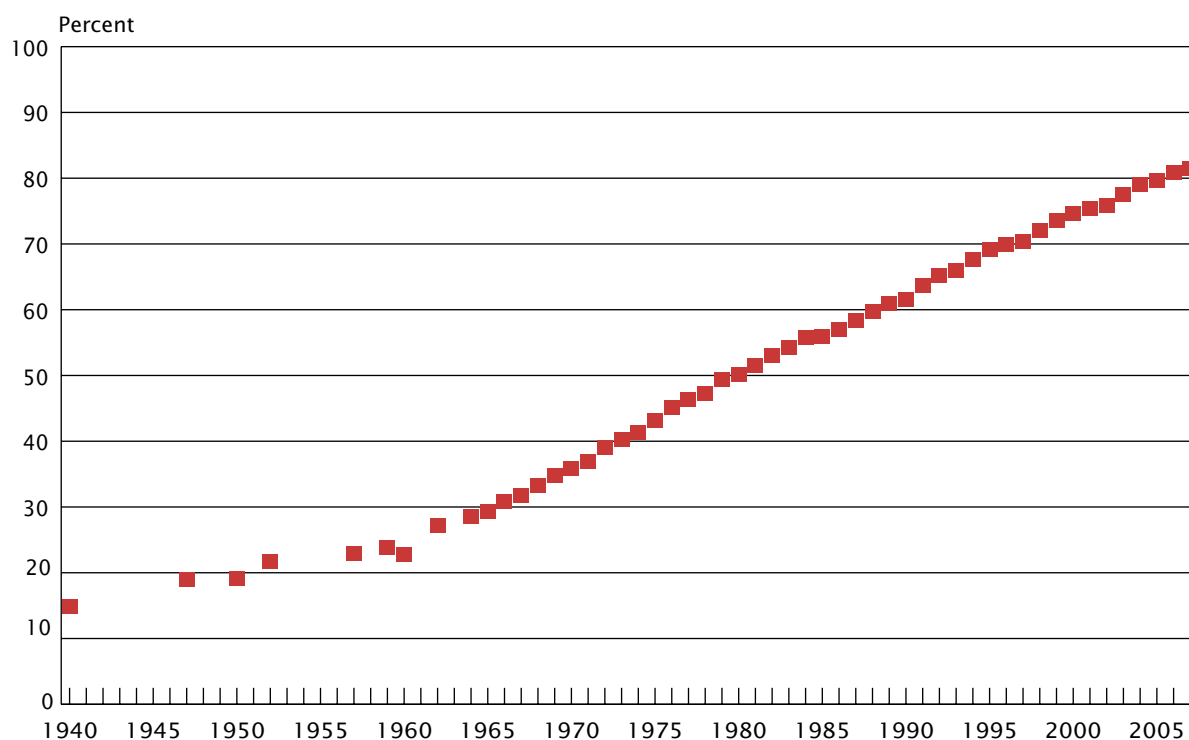
this may not always be the case for older people. In Portugal and Malta, for example, 1 in 7 people aged 60 to 64 was illiterate in 2000, and the proportion illiterate at ages 70 and over was roughly one-fourth (United Nations Department of Economic and Social Affairs, 2002).

### FUTURE OLDER PEOPLE WILL HAVE HIGHER LEVELS OF LITERACY AND EDUCATION

The other side of the story from Figure 8-3 is that today's younger people have a much higher literacy rate than the older population, implying that future cohorts of older people will be more literate. In China in 2000, for example, the population aged 25 to 44 was almost completely literate. The

Figure 8-4.

**Percentage of People Aged 55 and Over Who Have Completed High School or Above in the United States: 1940 to 2007**



Source: U.S. Census Bureau, Current Population Survey Historical Tables, Table A-1 "Years of School Completed by People 25 Years and Over, by Age and Sex: Selected Years 1940 to 2007," <[www.census.gov/population/www/socdemo/educ-attn.html](http://www.census.gov/population/www/socdemo/educ-attn.html)>, accessed on October 2, 2008.

oldest members of the 25-to-44 age group in Figure 8-3 will turn 65 around 2020, which means in less than two decades, the illiteracy rate for the older population in these countries will be substantially lower.

A similar improvement is seen with regard to formal education in countries with reliable statistics over time. The general trend is illustrated by data for the United States in Figure 8-4. The percentage of people aged 55 and over who had completed at least the high school level rose from around 15 percent in 1940 to more than 80 percent as of 2007. Data for 27 OECD member states show that the overall trend toward higher educational attainment has continued in recent years.

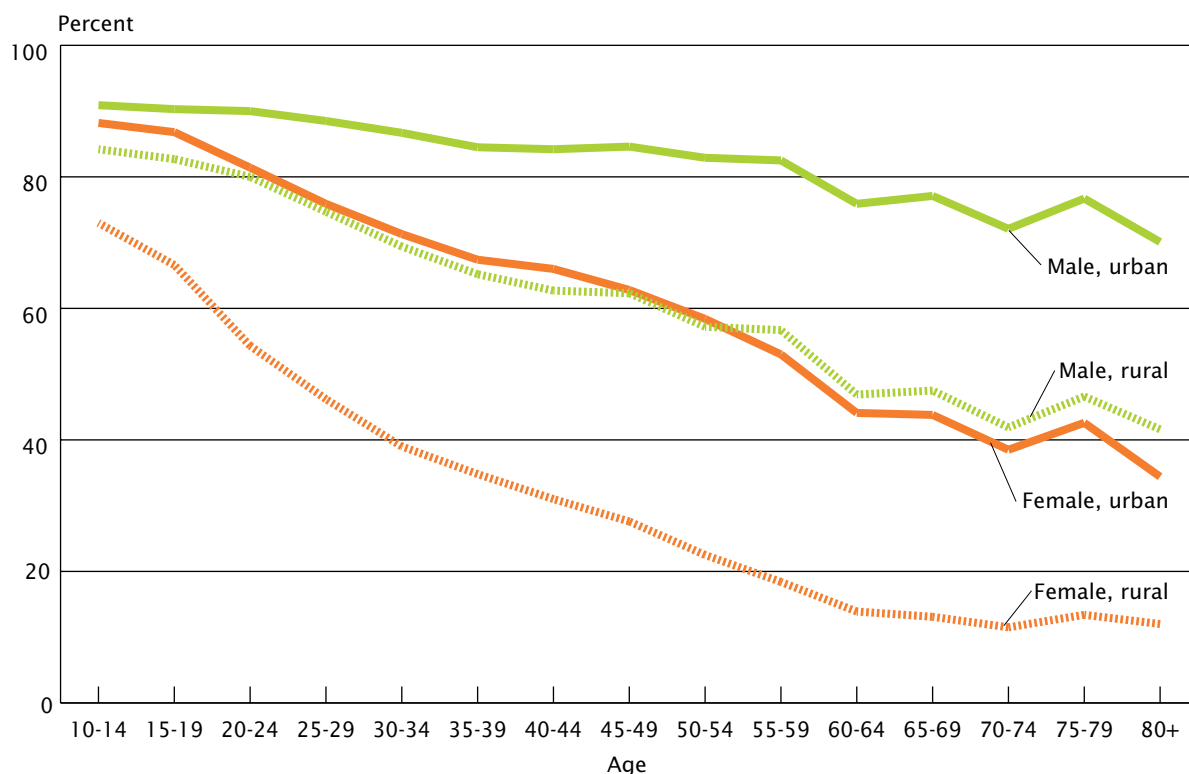
The percentage of people aged 55 to 64 who had completed upper secondary education was higher in 2005 than in 1998 in each of the 27 nations (OECD, 2001; and OECD, 2007c). Similar data for a subset of developing countries compiled by the United Nations Educational, Scientific and Cultural Organization (UNESCO) generally show the same trend (UNESCO and OECD, 2000; and UNESCO, 2006).

In developed countries, participation in job training and job-related adult education has become a common experience, as indicated by results from the 22-country International Adult Literacy Survey (Statistics Canada 2001). The rate of participation in job-related

training for older workers (aged 56 to 65) ranged from 6 percent in Chile to 40 percent in Finland, with levels between 30 percent and 40 percent in Canada, Denmark, Norway, Slovenia, and the United States.<sup>1</sup> People with higher educational attainment were more likely to participate in further education and training. The relationship between extant and additional education is seen more clearly in data for 25 European countries. Among people aged 55 to 64 in 2004, 2 percent of those with lower secondary or less education, 5 percent of those with secondary

<sup>1</sup> Participation in job-related training refers to any such activity during the 12 months prior to the International Adult Literacy Survey.

Figure 8-5.  
**Percent Literate by Age, Sex, and Urban and Rural Residence in India: 2001**



Source: India 2001 census.

education, and 12 percent of those with tertiary education participated in lifelong learning activities. This pattern was also observed among younger people; for example, the corresponding percentages for those aged 45 to 54 were 3 percent, 7 percent, and 18 percent, respectively (European Commission, 2007).

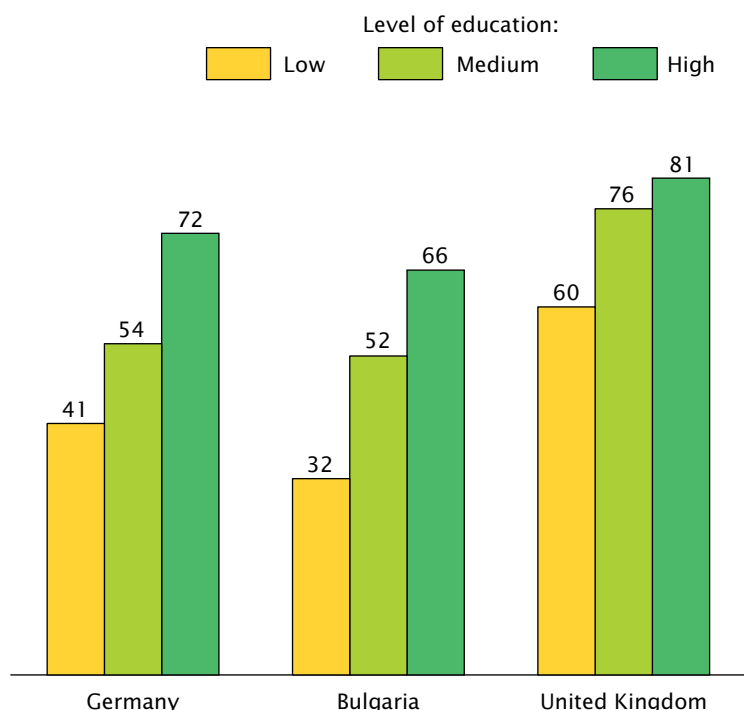
### **EDUCATIONAL DISADVANTAGE COMMON IN RURAL AREAS**

Levels of literacy and educational attainment are lower in rural than in urban areas of most countries, particularly in the developing world. Census data for India (Figure 8-5) illustrate the common pattern wherein the rural

disadvantage in literacy is evident for both sexes (i.e., rural males have lower literacy rates than urban males, and rural females have lower rates than urban females). After age 50, rural men are more likely than urban women to be literate. Above age 60, less than 15 percent of India's rural women can read and write.

Figure 8-6.

**Employment Rate for People Aged 50 to 64  
in Germany, Bulgaria, and the United Kingdom  
by Education Level: 2005**



Source: Zaidi and Fuchs, 2006.

**EDUCATIONAL LEVEL  
CORRELATES WITH OLDER  
PEOPLE'S EMPLOYMENT  
AND EARNINGS**

The added economic value of an education has been widely researched and documented. Employment rates increase with educational status, regardless of

age. Data on older workers (aged 50 to 64) in Germany, Bulgaria, and the United Kingdom in 2005 illustrate the pattern (Figure 8-6). People with relatively high education are much more likely to be employed than those with low education. The same gradient seen in Figure 8-6 was observed in all

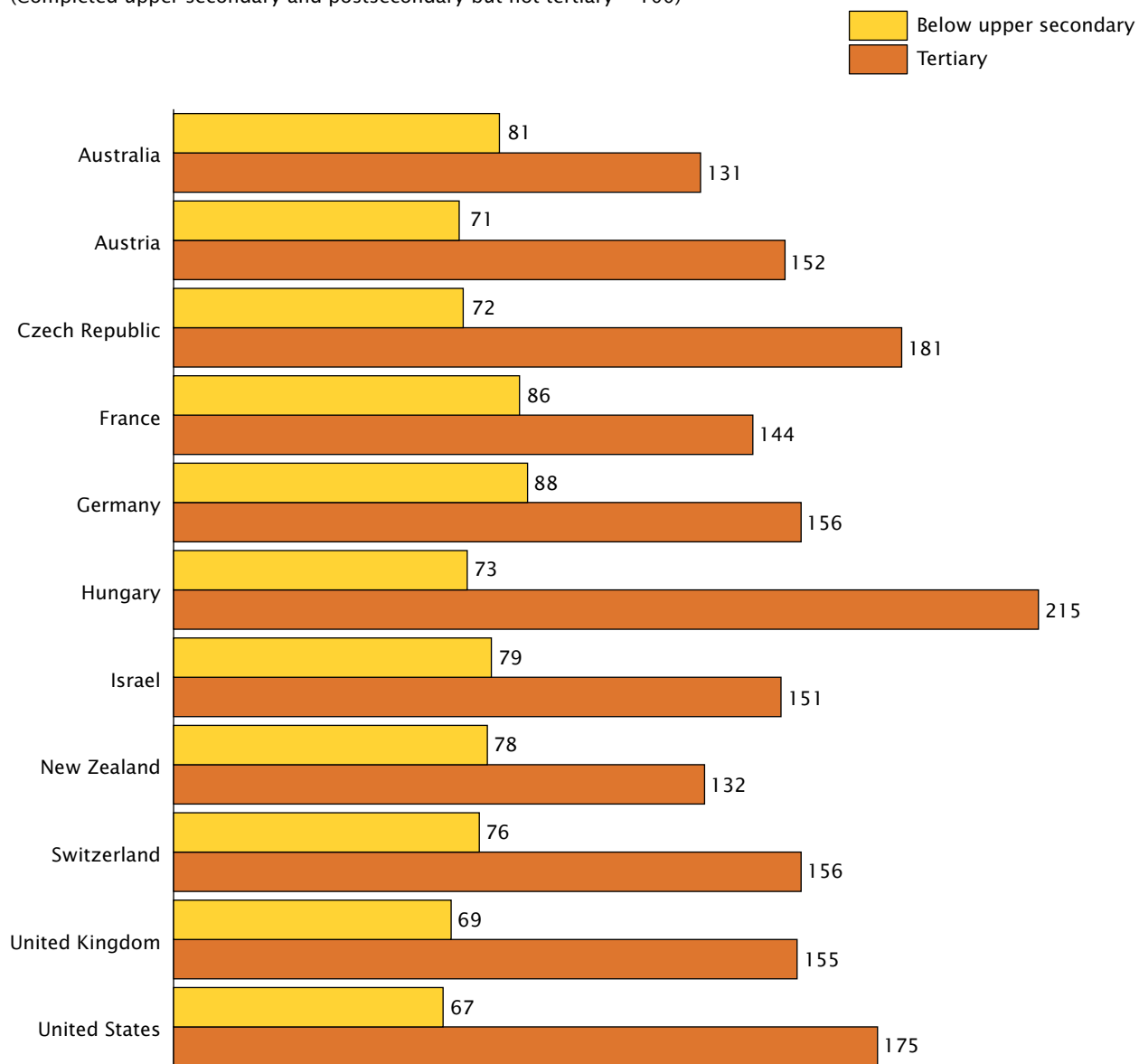
27 countries of the European Union (Zaidi and Fuchs, 2006). The lowest employment rate (23 percent) was observed among people with only basic schooling in the Slovak Republic and the highest (86 percent) was among older workers in Sweden with tertiary education.

Earnings also increase with educational level. At most ages, higher educational attainment correlates with higher earnings (Day and Newburger, 2002). U.S. data for full-time workers aged 25 and over in 2007 (U.S. Bureau of Labor Statistics, 2008) show a clear gradient by educational level, with median weekly earnings of \$424 for those without a high school diploma, \$610 for high school graduates, and \$1,086 for people with at least a bachelor's degree. Figure 8-7 illustrates differences in earnings by educational attainment for people aged 25 to 64 in 11 countries in 2005. Relative to those who completed upper-secondary but not tertiary education, earnings for people with less than upper-secondary education generally were 20 percent to 30 percent lower, while those with tertiary education had noticeably higher earnings. Data from Eastern Europe and the former Soviet Union also provide evidence of increasing returns from education (Chawla et al., 2007).

Figure 8-7.

**Relative Earnings for People Aged 25 to 64 in 11 Countries  
by Educational Attainment: 2005**

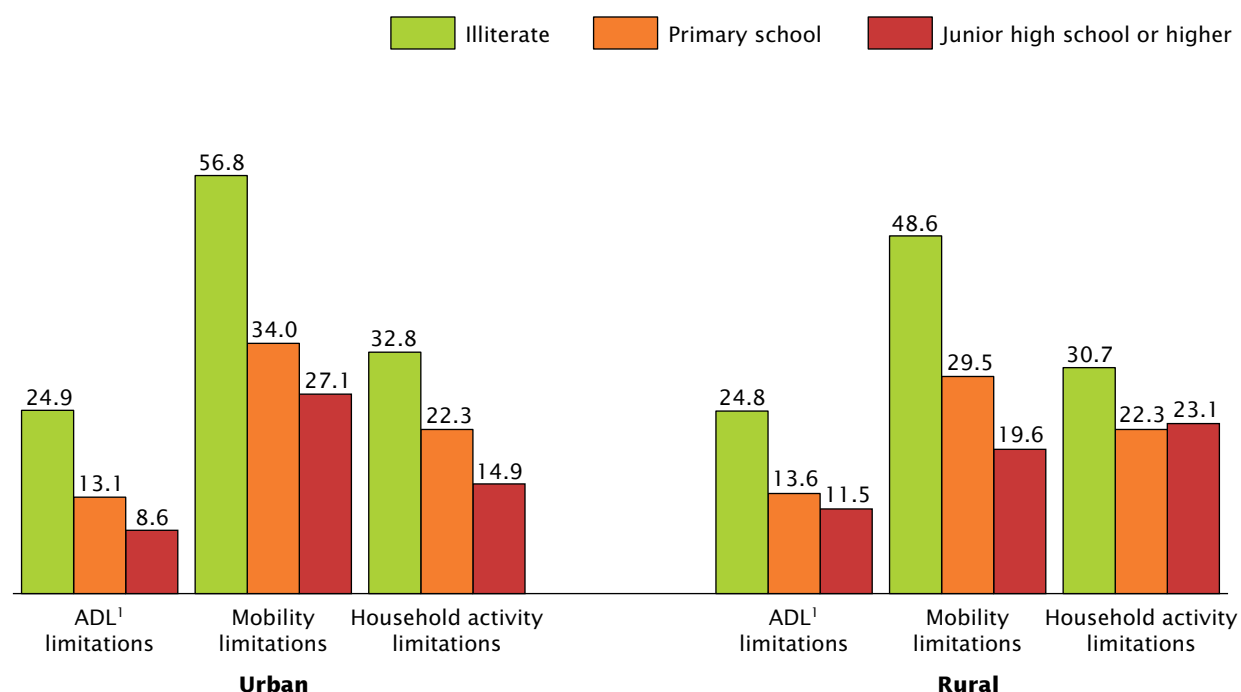
(Completed upper secondary and postsecondary but not tertiary = 100)



Source: Organisation for Economic Co-Operation and Development (OECD), 2007c.

Figure 8-8.

# **Percentage of People Aged 60 and Over With Activity Limitations in China by Educational Attainment and Urban/Rural Residence: 2000**



<sup>1</sup> ADL is activity of daily living.

Source: He et al., 2007.

## **EDUCATION IMPROVES OLDER PEOPLE'S PHYSICAL FUNCTIONING AND SELF-REPORTED HEALTH**

The positive effects of education extend beyond employment and earnings. Education also affects health through pathways such as health care, environmental exposure, and lifestyle (Adler and Newman, 2002; and Mirowsky and Ross, 1998). The association between education and other positive socioeconomic factors and health at older ages in Western societies as well as in Asia have been consistently documented (e.g., Beydoun and Popkin, 2005; Jiang et al., 2002; and Zimmer et al., 2004).

Survey data from China show that the prevalence of activity limitations among China's older people varies by educational attainment (He et al., 2007). Limitations in activities of daily living and mobility were highest among the illiterate and decreased progressively with each level of education. The largest difference was observed between the illiterate and those with primary education, indicating that even a few years of education may be associated with better physical functioning at older ages (Figure 8-8). Another study found that in Taiwan, education was a predictor of functional limitations, but not the severity

of the limitations, in older people (Zimmer, Hermalin, and Lin, 2002). The study's authors noted that older people with higher educational attainment could better afford higher quality and more constant medical care throughout their lives. They also found that the educational level of adult children influenced their parents' functional status by providing additional resources for the parents' care. Improvements in education seem likely to contribute to improvements in health and functioning among future older people (Freedman and Martin, 1999).



Box 8-1.

## Silver Surfers—Older People and the Internet

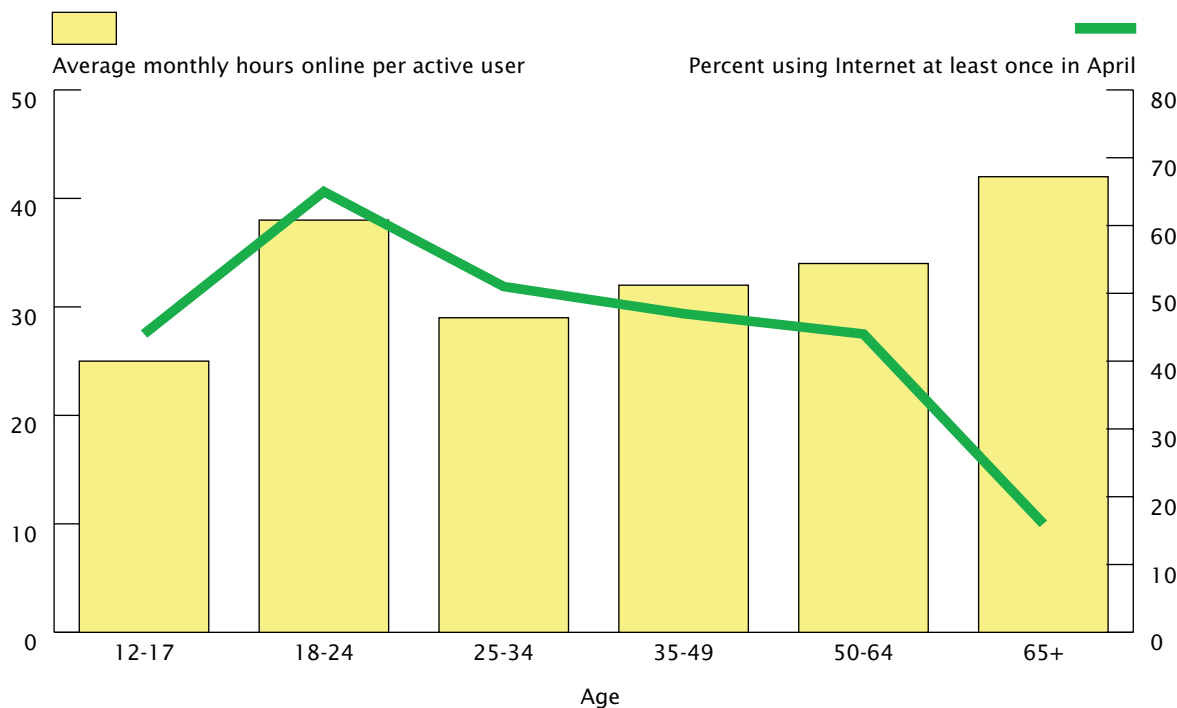
Access to and use of the World Wide Web is increasingly important for older people. The Internet plays a central role in communicating (both informally and officially) information about health and health-related products, providing tools for financial planning and investment, banking, filing taxes, and enrolling in government programs, as well as many other activities, such as online shopping and entertainment. The ability to access such services from home may be especially important for infirm or homebound older people. Some societies have seen the rise of computer literacy services targeted to seniors. Since 1996, the Home Computing Network has opened more than 300 schools in Japan. The average age of students is 60 and about three-quarters are women, mostly housewives (McNicol, 2006).

In 2005, one-quarter of Japanese adults aged 60 and over had online access. The share of older Canadian households (head aged 65 and over) with Internet

access rose from 3 percent to 23 percent between 1997 and 2003 (Turcotte and Schellenberg, 2007). Data from the Pew Internet & American Life Project (2008) in the United States show that Internet use has been rising most rapidly among people aged 65 and over. In late 2007, 37 percent of this age group reported using the Internet, with men and women equally likely to be Internet users. The picture in the United Kingdom is very different—the usage level among people aged 65 and over was 16 percent in 2007, and nearly 4 out of 5 users were men (United Kingdom Office of Communications, 2007). Older people in the United Kingdom who do use the Internet are the most active of any age group in terms of hours online per month (Figure 8-9). A 15-country study in Europe in 2001 (Senior Watch, 2002) found that the highest level of Internet use among people aged 50 and over was in Sweden, where 47 percent had used the Internet at least once in their lifetime. The average across all 15 nations was 22 percent.

Figure 8-9.

### Internet Use in the United Kingdom by Age: April 2007



Source: United Kingdom Office of Communications, 2007.

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## HEALTH LITERACY AND FINANCIAL LITERACY ARE GAINING ATTENTION

Literacy today often goes beyond basic reading and writing to include concepts such as health literacy and financial literacy. Health literacy is the degree to which people have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions (Institute of Medicine, 2004). People with adequate health knowledge are better equipped to manage their health, utilize health services, and function in the health care environment. Studies have shown that many older patients have inadequate or marginal health literacy (Gazmararian et al., 1999) and that inadequate health literacy

independently predicts overall mortality and cardiovascular death among community-dwelling older people (Baker et al., 2007).

Financial literacy refers to understanding basic financial concepts and the ability to interpret financial information that affects a person's savings, retirement planning, mortgages, other financial decisions, and wealth accumulation. Studies in the United States and other countries have found that financial illiteracy is widespread. A majority of U.S. workers do not understand well the rules governing social security benefits, and workers who are less well-off and most dependent on social security are the least informed (Gustman and Steinmeier, 2004; Lusardi and Mitchell, 2007; and Lusardi, 2008).

Financial literacy is increasingly important as many countries switch part or all of their pension systems away from defined-benefit schemes toward defined-contribution arrangements that require individual workers to more closely manage their retirement assets (see Chapter 10). In recent years, government agencies, private foundations, school systems, and employers have initiated education programs designed to help people improve their financial literacy (Hogarth, 2006; and Lerman and Bell, 2006). The U.S. Federal Reserve System, for example, is actively promoting awareness of the importance of financial education by increasing access to financial information and providing resources in collaboration with educational and community organizations.

## Labor Force Participation and Retirement

Rapid growth of the older population may put pressure on a nation's financial resources, in large part because of the need to fund systems to provide financial support after retirement. Many older people, however, continue to work beyond normal retirement age. Globally, older workers share several characteristics. Labor force participation declines as people near retirement age, and participation rates are higher for older men than for older women. In all countries, workers aged 65 and over constitute a small proportion of the total labor force. Their share of the total labor force in the 52 study countries ranged from less than 1 percent to about 7 percent. While there are global similarities among older workers, there also are clear regional differences. The rate of labor force participation of older workers varies considerably and generally is lower in developed than in developing countries. One recent phenomenon is a reversal of the previous downward trend in labor force participation of older men in many developed countries. Examining trends in the labor force participation of the older population

gives a clearer picture of their contribution and helps policymakers plan for the financing of retirement.

### LABOR FORCE PARTICIPATION AT AGES 65 AND OVER EXCEEDS 30 PERCENT IN SOME COUNTRIES

Older people's labor force participation rates are lower than those of younger people and become progressively lower with increasing age. In most countries, labor force participation rates for people aged 65 and over are much lower than those of young or middle-aged populations and also those of preretirement people aged 55 to 59 and 60 to 64 (Table 9-1).<sup>1</sup> However, there are regional differences. While people aged 65 and over in Europe have relatively low (less than 10 percent) participation rates, one-third or more of this age group is economically active in some developing countries.

Table 9-1 shows that a higher percentage of older men than women

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<sup>1</sup> See Appendix Table B-8 for selected years of labor force participation rates by age and sex in 51 study countries.

are economically active in every country. Rates of economic activity for men are higher in most developing than developed countries. The difference is especially pronounced at ages 65 and over; two-thirds of men in this age group are in the labor force in Bangladesh, Guatemala, and Uganda. Economic activity rates for older women also tend to be higher in developing than in developed countries. Not surprisingly, many older people in predominantly rural agrarian societies work of necessity, while "retirement" may be an option for a limited segment of wealthier older people. Some national data may understate the economic activity of women, particularly in developing countries where much of the work that women engage in is not counted or captured in censuses and labor force surveys or is not considered to be market-related work. Many of the activities of older women, such as subsistence agriculture or household industries, often are not well documented by conventional data collection methods (Hedman, Perucci, and Sundström, 1996).

Table 9-1.

**Labor Force Participation Rates by Age and Sex for Selected Countries: Circa 2006**

Country	Year	Male						Female					
		25 to 44 years	45 to 49 years	50 to 54 years	55 to 59 years	60 to 64 years	65 years and over	25 to 44 years	45 to 49 years	50 to 54 years	55 to 59 years	60 to 64 years	65 years and over
Western Europe													
Austria .....	2006	94.4	93.1	87.6	69.1	21.9	5.5	81.7	82.6	75.0	41.9	10.1	2.2
Belgium .....	2006	93.6	91.4	85.2	58.3	22.6	2.7	82.0	72.8	61.1	36.2	10.3	1.0
France .....	2005	94.6	94.1	90.3	62.5	15.4	1.6	80.8	83.2	77.3	53.4	13.4	0.8
Germany .....	2006	93.8	94.3	91.2	82.0	42.3	5.0	79.7	83.5	78.7	65.6	24.4	2.2
Greece .....	2006	95.4	95.6	89.4	74.0	45.2	7.4	74.2	64.0	51.3	33.5	21.8	2.1
Italy .....	2006	91.2	94.0	89.0	58.0	28.9	6.1	67.0	62.3	54.0	32.8	10.2	1.2
Eastern Europe													
Bulgaria .....	2006	86.7	84.1	79.2	66.1	38.6	4.6	79.2	82.8	76.5	53.4	11.7	1.5
Czech Republic .....	2006	95.8	94.6	90.6	83.1	36.1	6.6	77.3	91.8	88.2	51.2	13.1	2.5
Poland .....	2006	92.5	84.7	75.7	51.6	26.8	8.2	79.3	77.9	59.8	25.3	12.4	3.3
Northern America/ Oceania													
Australia .....	2006	89.9	89.2	86.1	75.7	56.4	12.1	73.0	78.3	73.4	57.9	33.5	4.3
Canada .....	2006	92.0	90.8	87.8	76.1	53.3	12.1	81.8	82.6	78.1	62.3	37.1	5.2
New Zealand .....	2006	91.1	92.6	91.6	87.2	73.1	16.8	74.3	81.9	80.0	71.7	50.0	8.0
United States .....	2006	91.9	89.8	86.1	77.7	58.6	20.3	75.2	77.2	74.7	66.7	47.0	11.7
Africa													
South Africa .....	2003	82.9	80.8	73.7	63.5	40.6	25.6	65.4	62.6	50.9	38.4	15.2	9.6
Uganda .....	2003	(NA)	97.1	94.6	93.9	91.4	72.9	(NA)	93.5	92.2	87.1	80.3	53.7
Asia													
Bangladesh .....	2003	99.2	99.5	99.2	97.3	87.8	66.1	27.3	22.6	19.9	17.1	13.4	8.7
Japan .....	2006	96.1	96.9	95.7	93.2	70.9	29.3	68.0	74.0	70.5	60.3	40.2	13.0
Pakistan .....	2006	97.3	97.6	95.8	90.7	77.5	49.3	23.1	26.5	22.5	22.8	19.1	11.5
Singapore .....	2006	97.1	96.5	93.3	81.9	62.5	22.0	74.5	66.2	59.5	44.6	26.2	8.3
South Korea .....	2006	90.5	93.1	89.7	79.9	68.5	42.0	61.4	64.4	58.5	49.7	43.8	22.7
Turkey .....	2006	93.2	82.0	65.4	51.3	39.8	22.0	30.8	24.8	21.8	18.5	14.5	6.6
Latin America													
Argentina .....	2006	95.1	95.3	92.6	87.3	76.8	28.3	68.3	67.2	62.1	55.6	38.7	10.7
Brazil .....	2004	94.7	92.1	85.8	77.6	64.9	35.1	71.6	65.4	57.3	45.5	30.9	14.1
Chile .....	2006	93.9	95.3	91.4	86.1	73.2	26.9	55.6	51.9	48.4	40.1	25.3	7.7
Guatemala .....	2004	94.7	91.4	93.8	92.5	92.2	66.7	52.0	53.2	44.6	39.7	30.3	23.7
Mexico .....	2006	96.0	95.4	92.5	88.2	74.0	45.8	52.6	50.4	44.0	35.3	28.5	14.7
Peru .....	2006	95.3	98.7	94.6	87.0	65.5	28.8	70.1	67.0	56.2	39.2	34.9	15.3
Uruguay .....	2006	99.7	97.9	96.4	91.2	68.8	19.7	75.4	75.9	69.4	58.7	39.0	8.4

(NA) Not available.

Source: International Labour Organization, <<http://laborsta.ilo.org>>, accessed on February 8, 2008.

Figure 9-1 displays data on formal economic activity for older men and women in four countries, chosen to represent different levels of economic development and different regions. Some patterns mentioned above are apparent in these data—older women have lower participation rates than older men, and participation rates for each sex decrease with age. The work status of older workers differs substantially among the countries.

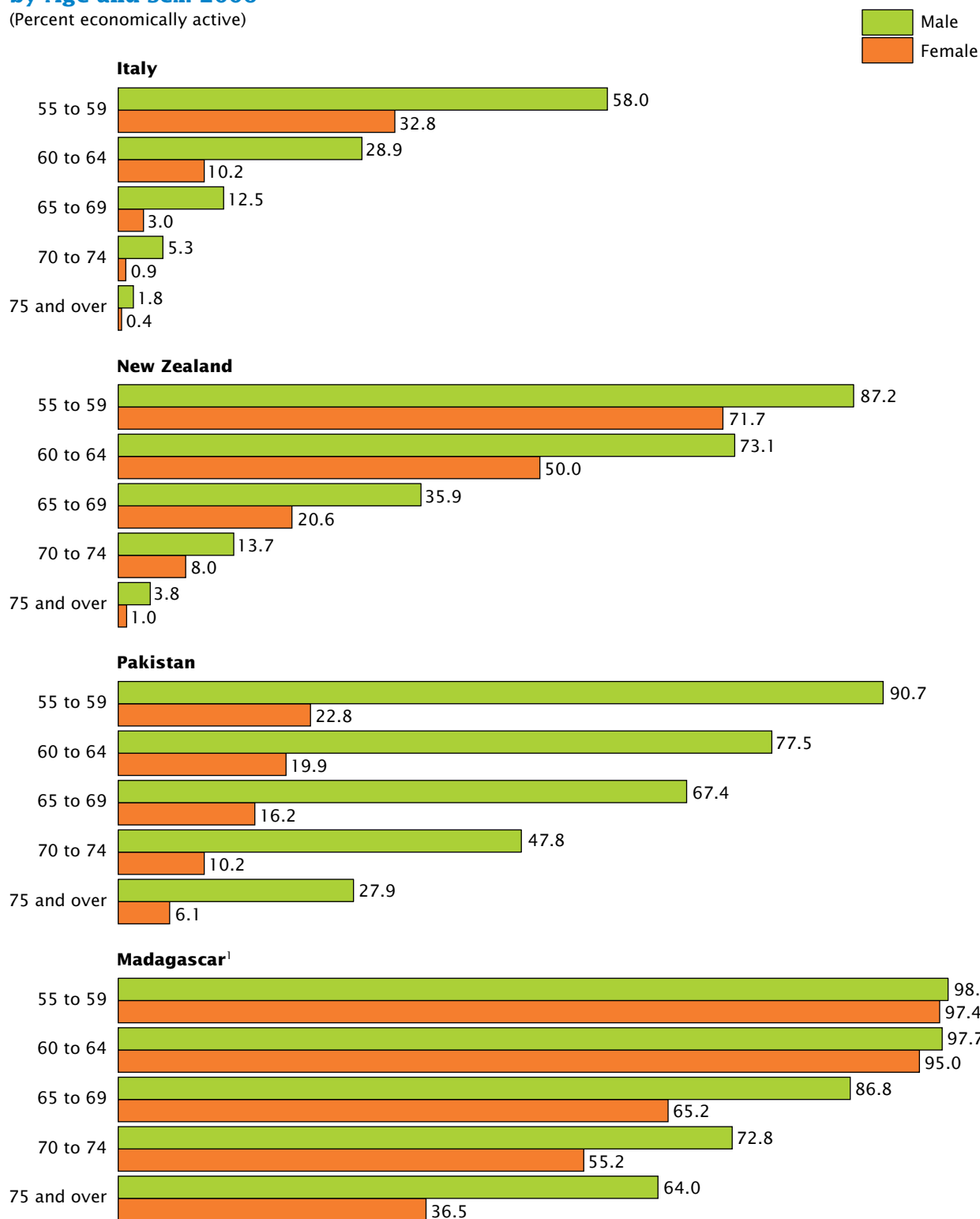
In Madagascar, nearly everyone between the ages of 55 and 65 works. Even at ages 70 to 74, more than half of all women and nearly three-quarters of men are economically active. In Pakistan, male participation rates under age 65 are similar to those in New Zealand, but the Pakistani rates are much higher after age 65. Female participation rates in Pakistan appear low for a developing country and may be subject to some of the reporting biases

mentioned above. By contrast, Italy represents the European experience of low participation rates among older workers. At ages 65 to 69, just 13 percent of men and 3 percent of women remain in the labor force. Such crossnational differences in levels of labor force activity are associated with societal wealth. Countries with high gross national products tend to have lower labor force participation rates at older ages than do low-income countries

Figure 9-1.

# **Labor Force Participation Rates for Italy, New Zealand, Pakistan, and Madagascar by Age and Sex: 2006**

(Percent economically active)



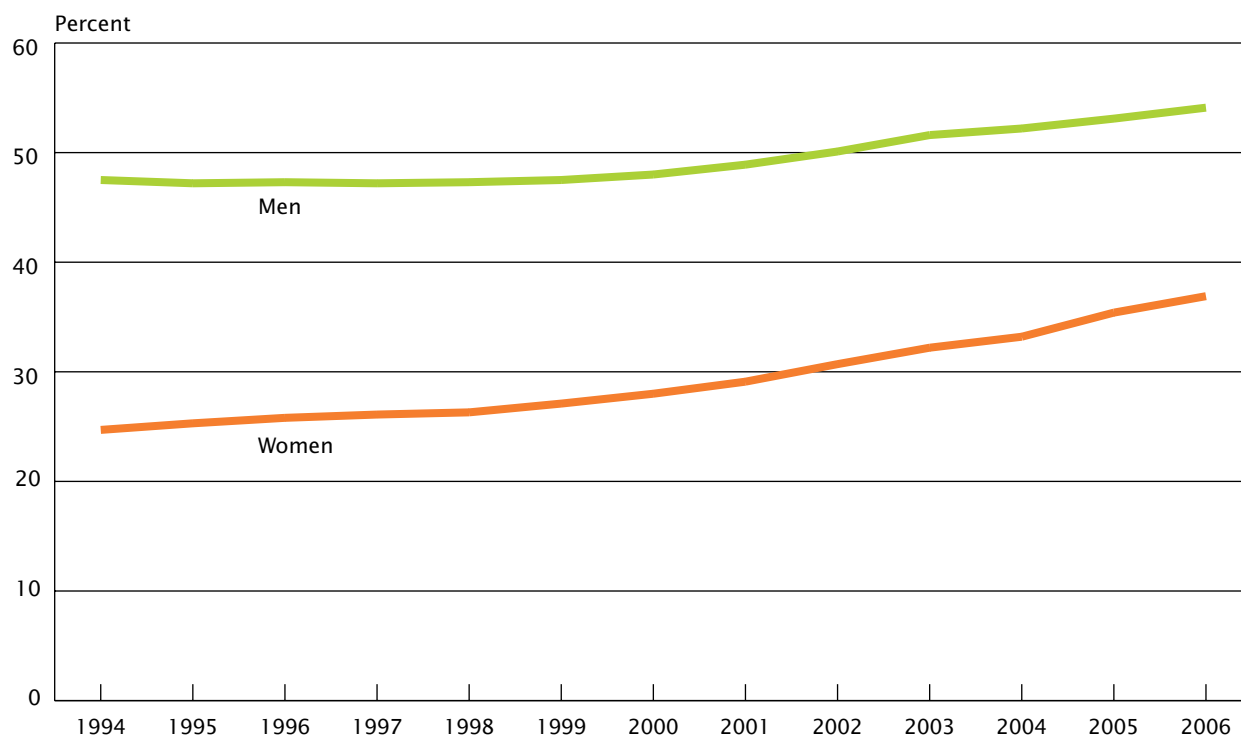
<sup>1</sup> Data for Madagascar refer to 2005.

Source: International Labour Organization, <<http://laborsta.ilo.org>>, accessed on February 5, 2008.

Figure 9-2.

### Aggregate European Union Employment Rate for People Aged 55 to 64: 1994 to 2006

(Aggregate data for 15 European Union countries)



Note: The countries included are Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, and the United Kingdom.

Source: Eurostat, <<http://epp.eurostat.ec.europa.eu>>, accessed on February 5, 2008.

(United Nations Department of Economic and Social Affairs, 2007a). In richer countries, long-standing social security and pension programs allow older workers to retire with at least a modicum of financial security. Such programs often are unavailable to large segments of society in poorer countries.

### NEW TREND IN LABOR FORCE PARTICIPATION SINCE 1990

A prominent economic concern in some countries is the shrinking of the workforce relative to the number of pensioners. Typically,

this ratio declines as people live longer and as their participation in the workforce decreases. From the 1950s to the mid-1980s, labor force participation rates for older men declined in most developed countries. Beginning in the 1990s, this trend reversed (Figure 9-2). In a 15-country group of European Union nations, the aggregate male employment rate for ages 55 to 64 was higher in 2006 than in 1994.<sup>2</sup>

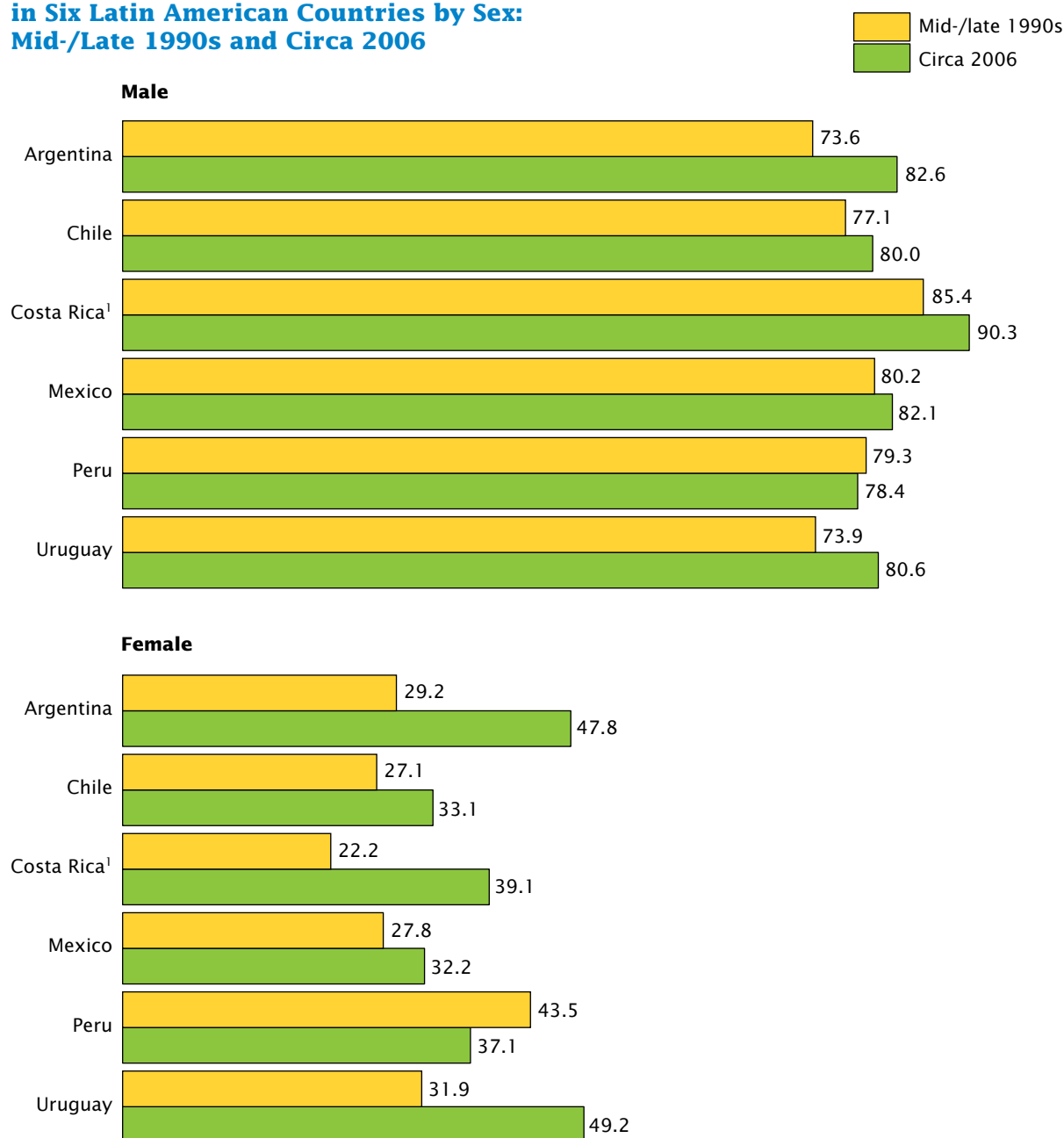
<sup>2</sup> The employment rate is the number of employed people in a given age group as a percentage of all people in that age group. This measure is slightly different than the labor force participation rate, which usually is defined as the fraction of the population in a given age group who are working or actively looking for work.

A similar trend has been observed in Australia, New Zealand, and the United States, and this phenomenon is discussed further at the end of this chapter. Among women in many developed countries, there has been an increase in labor force participation at older ages for at least the past two decades.

The picture in other parts of the world is less clear. Unlike in Western Europe, Northern America, and Oceania, where many countries experienced an increase in older people's economic activity, the downward trend continued in much of Eastern Europe. Increasing

Figure 9-3.

**Labor Force Participation Rate for People Aged 55 to 64  
in Six Latin American Countries by Sex:  
Mid-/Late 1990s and Circa 2006**



<sup>1</sup> Data for Costa Rica refer to ages 50 to 59.

Source: International Labour Organization, <<http://laborsta.ilo.org>>, accessed on February 5, 2008.

participation rates for people aged 55 to 64 were seen in Latin America (Figure 9-3), but this was not the case among people over age 64. No

trend appeared in Asia. Some countries (e.g., Indonesia, Singapore, South Korea, Thailand) experienced increases in both male and female

labor force participation while others (e.g., Japan, Philippines, and Turkey) saw decreases.

## AGRICULTURE STILL AN IMPORTANT SOURCE OF EMPLOYMENT FOR OLDER PEOPLE

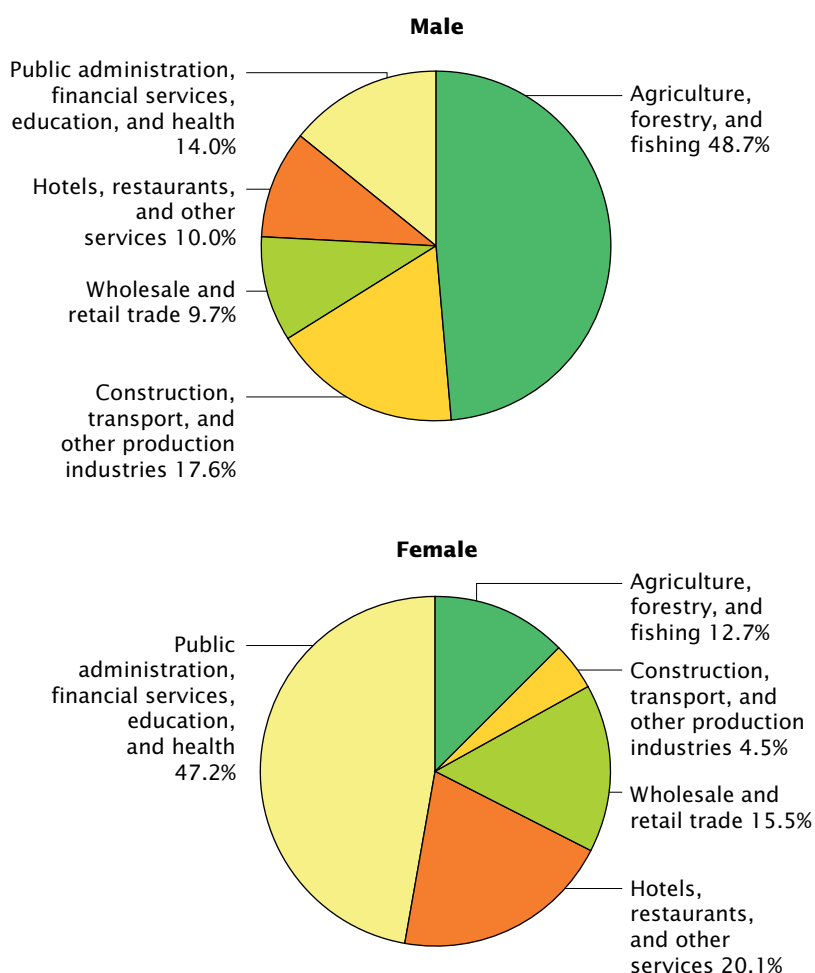
In spite of the general global shift from agriculture and heavy industries toward services and light industries, the agricultural sector remains an important provider of employment for older people in many countries. Crossnational data from Asia in the latter 1990s showed that well over half of men aged 60 and over were engaged in farming or other agricultural activities (Hermalin et al., 2002). In Malaysia in 2000, 20 percent of people aged 50 to 54, 33 percent of those aged 55 to 59, and 45 percent of people aged 60 to 64 worked in the agricultural and fishery sector (Aizan, Norazizan, and Mohmad, 2006).

This sector also is important in some developed countries. For example, the percentage distribution of employment by economic sector in Ireland shows that in 2006, almost half of working men aged 65 and over were farmers (Figure 9-4). European Union agricultural statistics for 2005–2006 indicate that more than half of all agricultural holders were 55 years and older. People aged 65 and over represented nearly half of all small agricultural unit holders in several European Union countries (Bulgaria, Greece, France, and Italy) and more than half in Belgium, Spain, and Portugal (Figure 9-5).<sup>3</sup>

In many countries, the service sector has become most prominent in the employment of older people.

<sup>3</sup> A small agricultural unit is less than 1 European Size Unit (ESU). An ESU is a measure of the economic size of a farm business based on gross margin from each farm commodity. Roughly, 1 ESU corresponds to either 1.3 hectares of cereals, 1 dairy cow, 25 ewes, or some combination of these.

Figure 9-4.  
**Employment for People Aged 65 and Over in Ireland by Sector and Sex: 2006**



Source: Ireland Central Statistics Office, 2007.

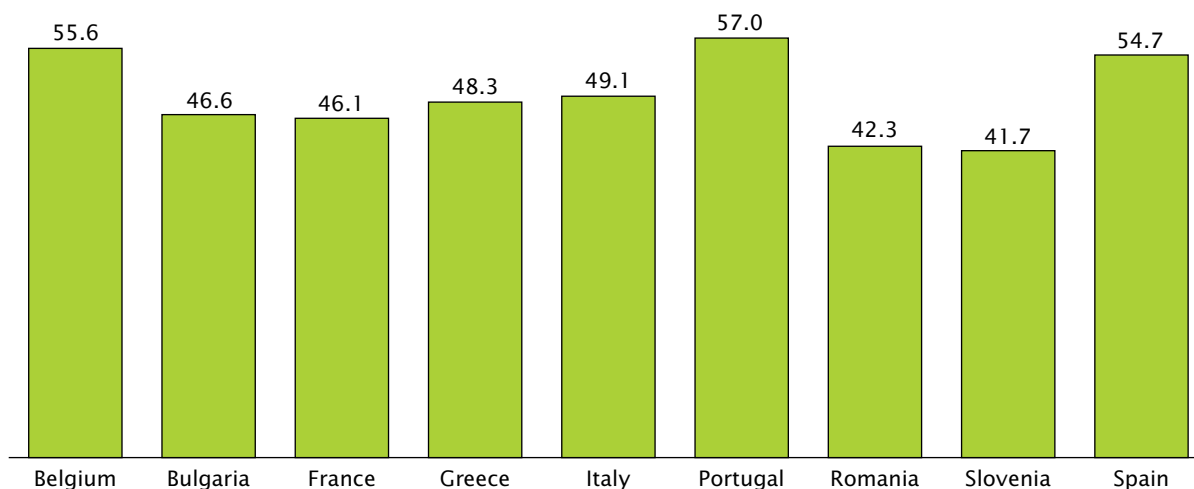
In Canada in 2006, about three-quarters of workers aged 55 to 64 were engaged in services. The largest share of jobs was in retail and wholesale trade, followed by health care and social assistance (Marshall and Ferrao, 2007). About the same proportion (77 percent) of Singapore's older workers (84 percent of women and 74 percent of men) were employed in the

service sector (Singapore Ministry of Manpower, 2007). According to European Union statistics, most of the overall rise in employment among older workers between 2000 and 2006 occurred in the fields of health, business services, education, social work, and real estate, reflecting an ongoing shift toward a knowledge-based economy (European Union, 2007).



Figure 9-5.

**People Aged 65 and Over as a Percentage of All Small Agricultural Unit Holders in Nine Countries: 2004**



Note: A small agricultural unit is less than 1 European Size Unit (ESU). An ESU is a measure of the economic size of a farm business based on gross margin from each farm commodity. Roughly, 1 ESU corresponds to either 1.3 hectares of cereals, 1 dairy cow, 25 ewes, or some combination of these.

Source: Benoist and Burak, 2007.

**DIFFERENT BRIDGES  
TO RETIREMENT  
HAVE EMERGED**

Just as the propensity to work at older ages varies considerably from country to country, so too do patterns of retirement and the concept of retirement itself. During periods of economic contraction in highly industrialized nations, governments may actively encourage older workers to cease active employment at relatively young ages. On the other hand, when the

labor market is tight, governments may look for methods to entice older workers to remain in or reenter the labor force.

In developed countries, retirement from the workforce was an event that occurred almost exclusively at a regulated age until the 1950s, with little possibility of receiving a pension prior to that age. Since then, countries have adopted a wide range of approaches to providing old age security, and different potential routes have emerged

for people making the transition from labor force participation to retirement. Some of these different routes are working part-time, leaving career jobs for transition jobs, or leaving the labor force because of illness or disability. Private employer-employee arrangements can also facilitate early retirement, sometimes in the form of "bridge pensions" that provide income until an individual becomes age-eligible for public benefits (OECD, 2002).

## PART-TIME WORK INCREASES WITH AGE

Many older workers work part-time as a transition to retirement. Older women are more likely than older men to work part-time, and the proportion of older workers who work part-time increases with age.

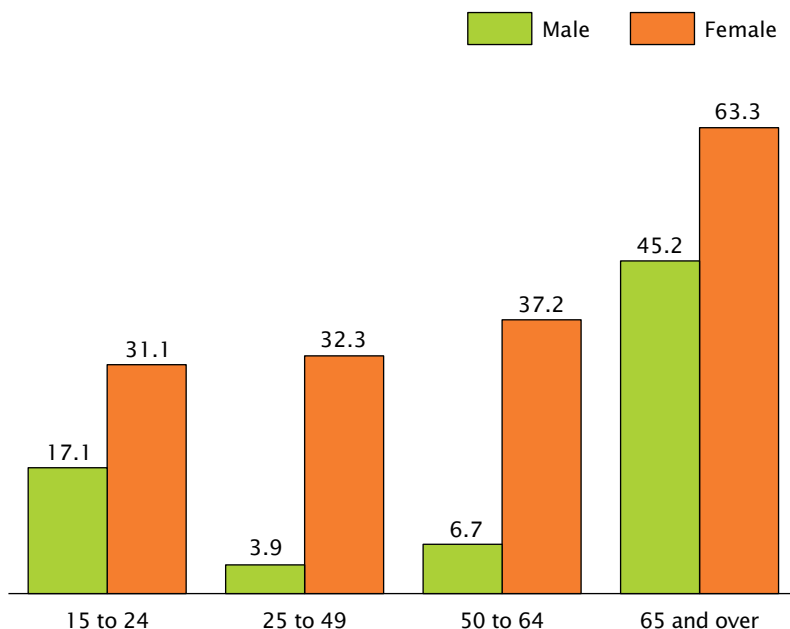
Figure 9-6 illustrates the change with age in the proportion of people working part-time in the European Union in 2002. The percentage of part-time male workers aged 65 and over was more than six times that of men aged 50 to 64. The percentage of women working part-time increased slightly from ages 15 to 64, then jumped to 63 percent among those aged 65 and over. The same age pattern has been observed in New Zealand and the United States. A study of four countries in Asia found that older (aged 60 and over) women in Singapore and Taiwan were about twice as likely as their male counterparts to work part-time (Hermalin et al., 2002). Data from the English Longitudinal Study of Ageing (ELSA) showed that, of people between age 50 and the state pension age<sup>4</sup> who were working in 2002–2003, 43 percent of women were working part-time compared with 10 percent of men (Emmerson and Tetlow, 2006). Figure 9-7 shows data for three age groupings of older workers by the number of weekly hours worked. Consistent with other data for the European Union, the number of weekly hours worked decreased with age, and fewer than half of working women aged 60 to 64 worked an average of 35 or more hours per week.

Part-time work among older workers has become increasingly

<sup>4</sup> The state pension age in the United Kingdom is 65 for men and between 60 and 65 for women. For more information, see <[www.thepensionservice.gov.uk](http://www.thepensionservice.gov.uk)>.

Figure 9-6.

### Percentage of All Workers Who Work Part-Time in the European Union by Age and Sex: 2002



Source: Corral and Isusi, 2007.

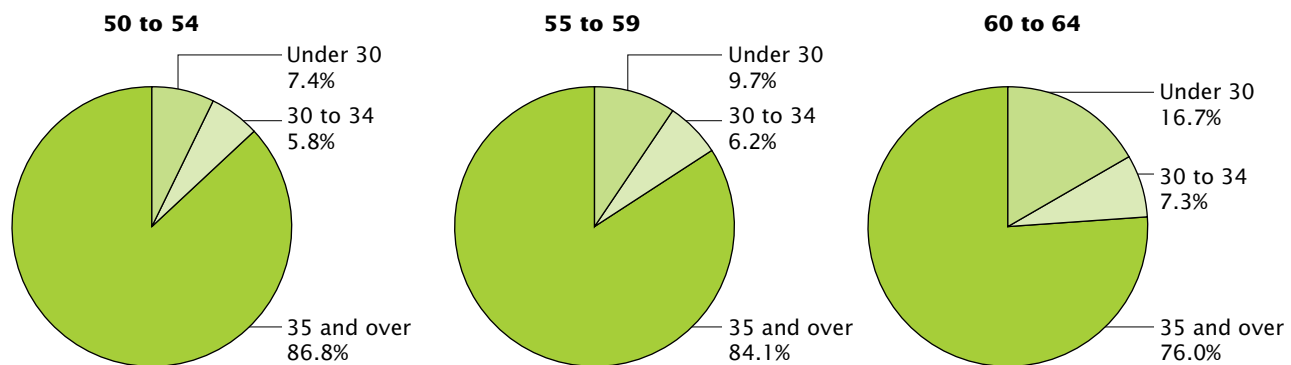
common in Europe in recent years, and research holds that the trend is associated with fewer opportunities for training and career progression, weaker job tenure, lower salary levels, and less access to supplementary payments and social protection benefits (Corral and Isusi, 2007). The trend toward part-time work (also called flexible work or gradual retirement) may also be a function of increasing government support for such arrangements (Vickerstaff, 2007). A rising incidence of disability, lifestyle choices, and economic necessity were cited as reasons for the fact that older people in New Zealand were more than twice as likely to work part-time as workers between ages 15 and 64 (Statistics New Zealand, 2007). Having a “phased”

rather than a “cliff edge” exit from the labor market was one of the preferences found among respondents in the ELSA. Phased retirement in the United States appears to be gaining popularity among both employers and employees, notably in areas that have a current or projected shortage of workers (e.g., public school teachers and administrators) (Brainard, 2002; and Watson Wyatt Worldwide, 2004). Legislative changes have sought to ease restrictions regarding older employees’ receipt of pension benefits, and a congressional research report indicated that 41 percent of men and 35 percent of women aged 55 to 64 who reported receiving pension income in 2005 were employed in 2007 (Purcell, 2007).

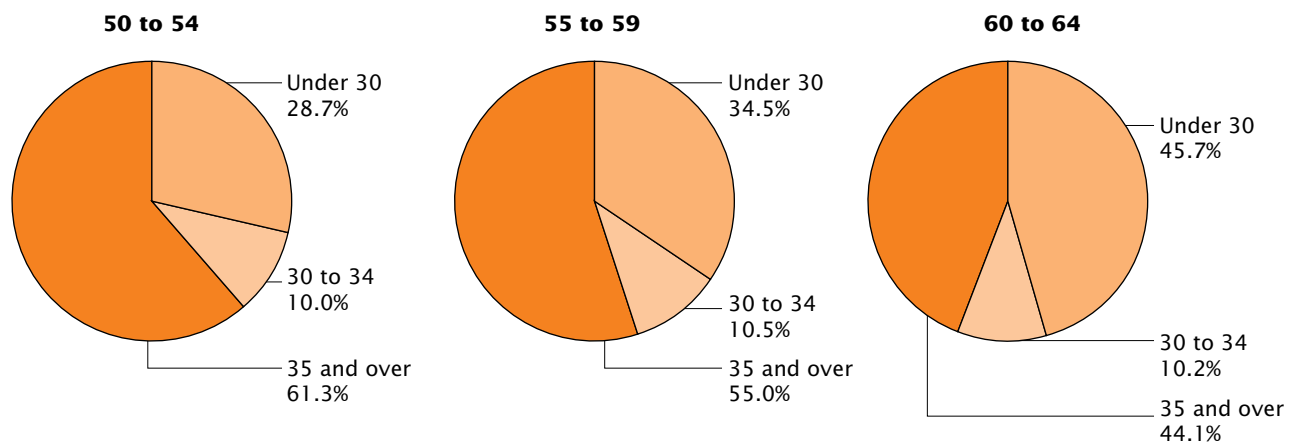
Figure 9-7.

**Number of Working Hours per Week for Employed Older Workers in the European Union by Age and Sex: 2005**

**Male**



**Female**



Source: Zaidi and Fuchs, 2006.

**UNEMPLOYMENT  
RELATIVELY LOW AMONG  
OLDER WORKERS**

Older workers typically have lower levels of unemployment than do younger workers. In developed countries, unemployment rates for workers aged 50 to 64 often are less than 5 percent. In almost all member countries of the Organisation for Economic Co-operation and Development (OECD) in 2004—including Turkey, Mexico, and South Korea—the unemployment rate for older workers was lower than for workers aged 25 to 49 (OECD, 2006b).

Establishing a long-time trend in the unemployment rates of older people is hindered by limited data, effects of the business cycle, and differences in definitions across countries. Data for Europe, for both men and women aged 55 to 64, show that unemployment rates were somewhat lower during the period 2002–2005 than they had been in the mid-1990s. This was true for younger age categories (ages 15 to 24 and ages 25 to 54) as well (OECD, 2006a).

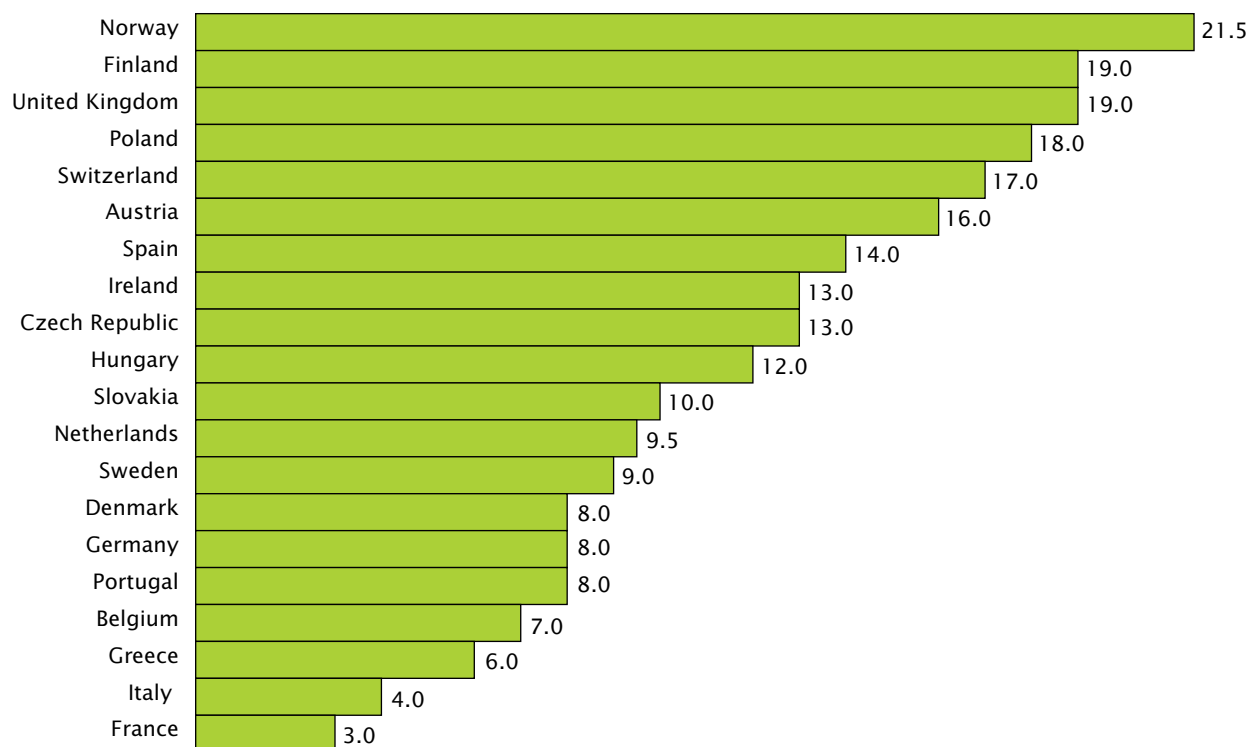
Although the unemployment rate may be lower for older than for younger workers, older people who

are unemployed tend to remain unemployed longer than their younger counterparts. In almost all OECD countries, long-term unemployment is more prevalent among people aged 50 to 64 than among people aged 25 to 49. And once unemployed, the likelihood of finding work is much lower for the older unemployed than for younger job seekers. OECD (2006b) reports that in Belgium, Finland, France, Germany, Greece, Poland, and Sweden, fewer than 15 percent of older people who reported being unemployed in 2003 were working in 2004. The situation appeared

Figure 9-8.

**Older Workers Not Working Because of Illness or Disability  
in 20 Countries: 2004**

(Percentage of all people aged 50 to 64 not working and who left a job in the previous 12 months)



Source: Estimated from Organisation for Economic Co-Operation and Development (OECD), 2006b.

much better in Norway and the United Kingdom, where about 40 percent were reemployed, but in all countries with data, older workers fared less well than younger workers in securing reemployment.

Long-term unemployment is one contributor to the ranks of discouraged workers. The definition of discouraged worker differs from country to country, but the basic concept refers to 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. Workers who become discouraged from actively seeking work are no longer considered part of the labor force. Movement of older workers into the discouraged-worker category stems from several factors, among them age discrimination; self-perceptions of productivity related to changed health status; and changes in occupational structures, requiring a more-educated workforce or different skills that favor younger over older workers (Alpass

and Mortimer, 2007). All of these factors may prompt some older workers to transition to retirement.

Crossnational data on discouraged workers are sparse. One comparison of 13 countries in the mid-1990s indicates that older workers made up a disproportionate share of all discouraged workers in all but one country (Sweden). People aged 55 to 64 accounted for a small proportion of all economically active people, but they accounted for a larger proportion of all discouraged workers (OECD, 1995).

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## **INVALIDITY AND DISABILITY PROGRAMS MAY BE AVENUES TO RETIREMENT**

Another gateway to retirement for older workers has been acceptance into a disability program. During the latter decades of the twentieth century, economic recessions and high unemployment led some European governments (e.g., Germany, the Netherlands, and Sweden) to promote retirement by expanding the scope of disability schemes and relaxing the eligibility criteria for long-term sickness benefits. In many countries in the late 1980s and early 1990s, disability pensioners made up the largest proportion of all early pensioners. Data for 1990 showed that the proportion of older people receiving an invalidity benefit could be large; for example, nearly one-third of all people aged 60 to 64 in Finland and Sweden and nearly half of the same age group in Norway (OECD, 1995).

While numerous nations have modified or revamped the eligibility rules for disability/invalidity benefits during the last two decades, such programs continue to play a prominent role in the

retirement process. In addition to people who may have retired due to disability and sickness, many inactive older workers may report illness or disability. Data from the 2004 European Labor Force Survey show that among people aged 50 to 64 who were not working but who left a job in the 12 months prior to the survey, 18 percent or more reported illness or disability as the main reason in Poland, Finland, the United Kingdom, and Norway (Figure 9-8). Older men were somewhat more likely than women to report illness or disability as a reason for not working in a 25-nation European Union aggregate; among older women in some countries, the most important reason for economic inactivity was neither retirement nor disability/illness but rather personal or family responsibilities (e.g., caregiving) that keep someone voluntarily out of the workforce (Eurostat, 2006).

### **ACTUAL RETIREMENT AGE OFTEN LOWER THAN STATUTORY AGE**

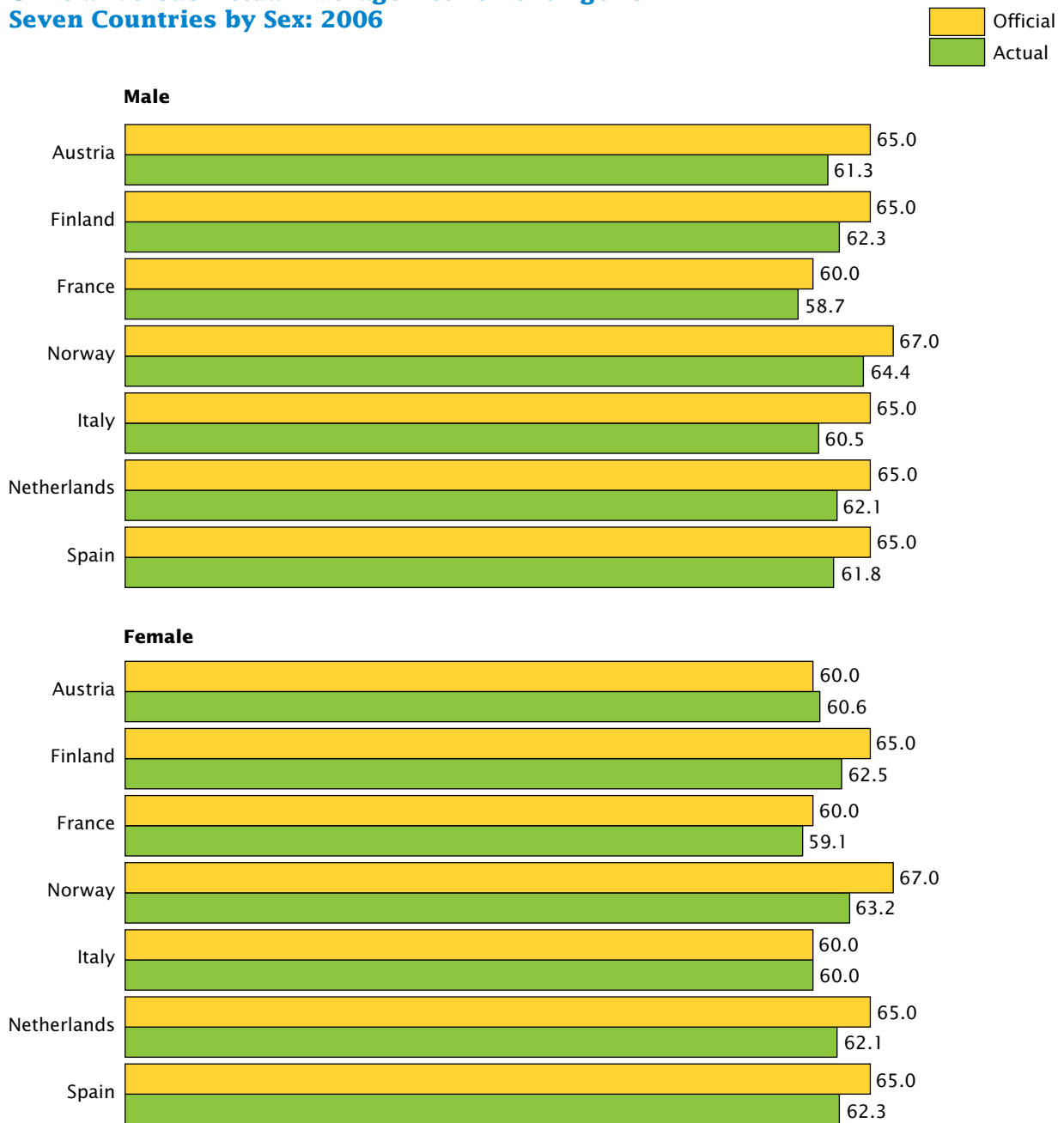
During the second half of the twentieth century, many industrialized nations lowered the standard (statutory) age at which people

become fully entitled to public pension benefits. The downward shift in statutory age was accompanied by an increase in the number of public early retirement schemes and a corresponding increase in the number of retirees leaving the labor force to avail themselves of such programs (Tracy and Adams, 1989).

One important issue for policy-makers and pension funds is the relationship between the standard (statutory) retirement age and “actual” retirement age, the average age at which retirement benefits are awarded. If the latter is lower than the statutory age, pension systems will be disbursing benefits for more years per recipient than was originally intended. The actual average age of retirement is lower than the statutory age in a large majority of industrialized countries. In many countries, the average man retires 3 to 5 years before the standard retirement age (Figure 9-9). Differences tend to be smaller for women, reflecting the fact that official retirement ages may differ by gender; in about half of European Union member states, the retirement age for women is lower than that for men (Eurostat, 2007b).

Figure 9-9.

**Official Versus Actual Average Retirement Age for Seven Countries by Sex: 2006**

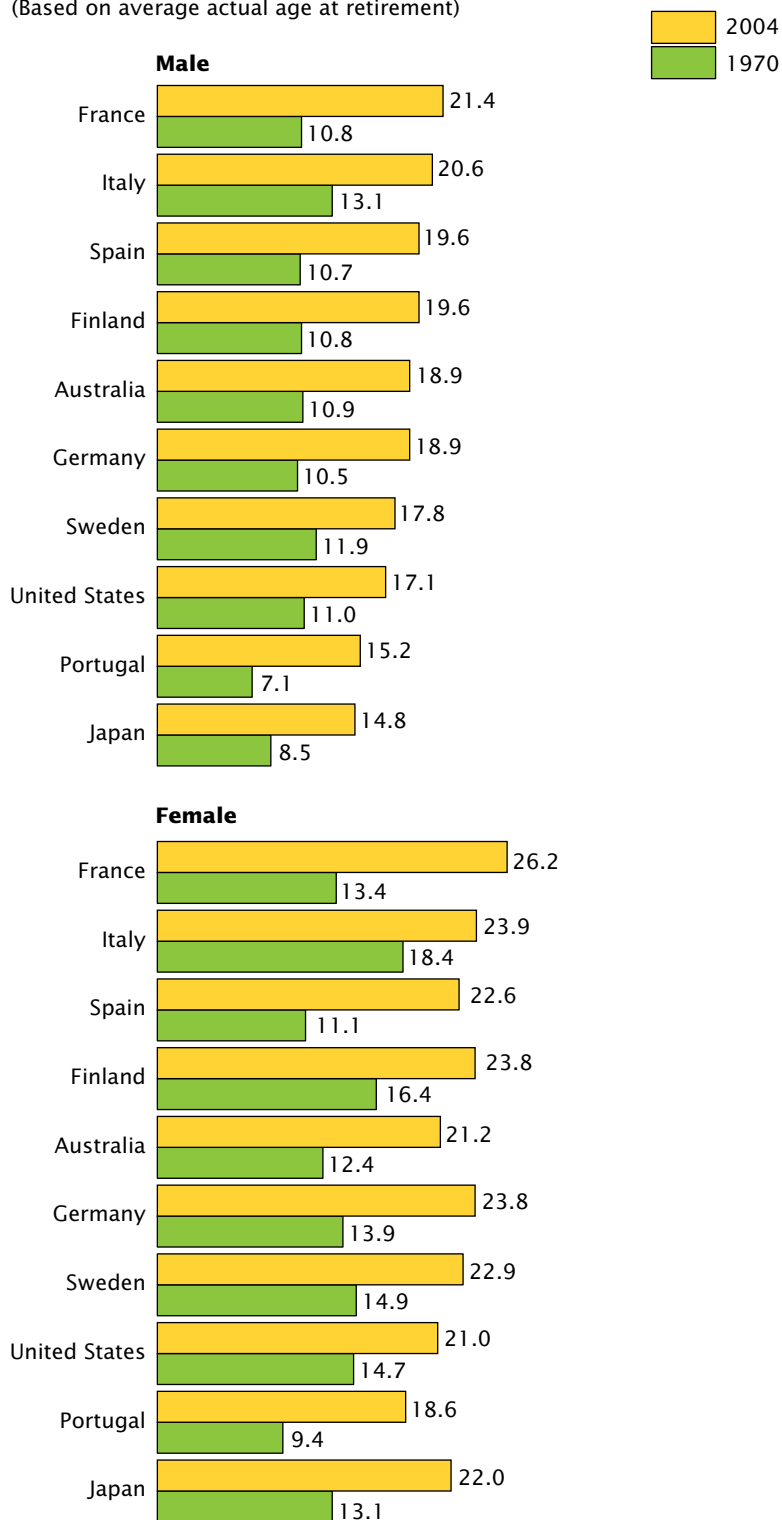


Note: Average retirement age based on a Eurostat probability model considering the relative changes of age-specific labor force activity rates from one year to another.

Source: Eurostat, <<http://epp.eurostat.ec.europa.eu>>, accessed on January 24, 2008; and U.S. Social Security Administration, 2006.

Figure 9-10.  
**Years of Life Expectancy After Retirement in  
 Ten Countries by Sex: 2004 Versus 1970**

(Based on average actual age at retirement)



Source: Organisation for Economic Co-Operation and Development (OECD), 2006b.

## ADULTS SPENDING GREATER PORTION OF LIFE IN RETIREMENT

Gains in life expectancy during the twentieth century coincided with declining retirement ages so that many individuals spent a higher proportion of their lifetime in retirement than was true for preceding generations. Figure 9-10 shows, for selected countries at two points in time, the number of years that an average worker could expect to live after he or she retired from the labor force. These data were generated using actual ages of retirement in 1970 and 2004 and estimates of remaining life expectancy at those ages in 1970 and in 2004 (OECD, 2006b). The length of time spent “in retirement” has increased markedly for both men and women. Men in some developed countries now spend more than 20 years in retirement. Because women live longer than men, and may be able to retire at an earlier age, the length of retirement for women typically is between 21 and 26 years. Years of life expectancy after retirement essentially doubled for women in France, Portugal, and Spain during the 34-year period.

## PUBLIC PENSION SYSTEM PROVISIONS CAN INDUCE EARLY RETIREMENT

Crossnational research over the past 15 years has documented that national differences in labor force participation at older ages often is a consequence (intended or unintended) of retirement provisions and/or tax policy (Cremer, Lozachmeur, and Pestieau, 2006; and Duval, 2003). In some countries, retirement benefit payments may increase for people who postpone their retirement beyond the allowable early retirement age. In other countries, there is no benefit

to be gained by postponing retirement. One synthesis of various studies in industrialized nations (Gruber and Wise, 1999) looked at the “implicit tax on work,” a concept that contrasts the longer stream of benefit payments that a worker would receive by retiring at an early age with the shorter stream of payments that a worker might receive by delaying his or her retirement. In France, for example, social security benefits are first available at age 60, and there is no increase in the eventual benefit payment rate for people who retire after age 60. In the United States, social security benefits may be initially obtained at age 62, but the benefit payment rate is less than if a worker retires later. The same study also considered public pension incentives to retire early (more formally, a “tax force to retire,” defined as the total of the annual tax rates on work between the ages of 55 and 69). Plotting this variable against a measure of unused productive capacity (the percentage of people aged 55 to 65 who were not working) revealed a strong crossnational relationship. This finding suggests that the financial structure of national social security systems may reward early retirement, and that attempts to encourage increased labor force participation at older ages may be highly affected by policy changes in these systems.

Gruber and Wise highlight the importance of focusing on the features of social security systems when studying labor force participation at older ages. Their subsequent work assessed the fiscal implications of pension program provisions and concluded that a 3-year increase in program eligibility ages could reduce current

program costs by more than one-quarter (Gruber and Wise, 2007).

### **DEVELOPED COUNTRY TREND TOWARD EARLIER RETIREMENT HAS CHANGED**

A majority of developed countries have initiated policies to encourage more work and alter retirement among older workers (Zaidi and Fuchs, 2006). As seen in Figure 9-2, employment rates of older workers in developed countries have been rising. This trend may, in part, reflect changes in government policies. Some nations have raised (or are considering an increase in) the statutory retirement age as one means to offset the fiscal pressures of population aging in addition to fostering other policies that encourage labor force participation at older ages.<sup>5</sup> Raising the participation rates of people aged 55 to 64 is one of the European Union’s main social policy objectives (Leibfritz, 2003).<sup>6</sup> Numerous countries have restricted the eligibility for labor force withdrawal due to disability, invalidity, and/or difficulty finding employment (OECD, 2006a). Since the early 1990s,

<sup>5</sup> In the United States, for example, the social security system was revised in 1983 to establish higher statutory retirement ages for people born after 1937 (i.e., who reach age 65 after the year 2002). An individual’s retirement age is linked to year of birth; beginning in the year 2003, the traditional retirement age of 65 began to edge higher in small (and temporally uneven) increments to the target age of 67 in the year 2025 <[www.ssa.gov/pubs/ageincrease.htm](http://www.ssa.gov/pubs/ageincrease.htm)>.

<sup>6</sup> Japan also encourages continued labor force participation. The relatively high participation rates for Japanese older workers are due to various factors, including economic necessity and a large proportion of self-employment and part-time replacement jobs (Williamson and Higo, 2007). Replacement jobs fill the gap between the mandatory retirement age of 60 and full public pension eligibility at age 65. High participation rates also are attributable to the active role of the Japanese government in promoting employment among older workers and to a culture that places a high value on men being economically productive in older age rather than focusing on leisure activities.

more than one-third of OECD countries also have legislated increases in the pensionable age (the age of first eligibility for benefits) for men and about two-thirds have done so for women (Turner, 2005). In 2006, the average age at which workers over 50 retired in the United Kingdom reached its highest level since this measure was first used in 1984. As discussed further in the next chapter, many countries have tried to move away from private defined-benefit pension plans (with actuarial incentives to leave work at a relatively early age) toward defined-contribution plans (which are neutral in this regard).

Trend data on retirement in developing countries are generally unavailable. The situation in Taiwan is counter to the developed-country trend toward later retirement. The average age at retirement in Taiwan was 54.9 years in 2004, the lowest level since the government began calculating this measure in 1991. Of all the people who retired in 2004, 32 percent were aged 60 or above; in 1991, the corresponding figure was 71 percent. More than half of all retirees were aged 50 to 59 (Republic of China [Taiwan] Government Information Office, 2006). South Korean survey data indicate that the average worker aged 55 to 79 in 2006 had worked for 21 years and left his or her longest-serving job at age 53, down from age 54 in 2004 (Korea National Statistics Office, 2008). However, most South Korean workers take on some form of employment, usually for lower pay, after leaving their primary job. Information for 2004 suggests that after leaving a primary job at age 54, the average worker works in some capacity for another 14 years before fully retiring at age 68.



## Pensions and Old-Age Security

Population aging will likely require an increase in budgetary outlays in the form of old-age pension payments. This issue is particularly salient in countries where public pensions are predominately financed on a pay-as-you-go basis. While some European public pension systems date back to the end of the nineteenth century, many systems around the world were formed largely after World War II. Since the early 1990s, pension reform has become a high priority in many nations; more than half of the 30 Organisation for Economic Co-Operation and Development (OECD) countries have made major changes during the past 10 to 15 years (OECD, 2007b). In both the developed and developing world, nations have revamped or are reconsidering their existing old-age security systems, often with an eye toward introducing or strengthening private (contributory) pension schemes.

### DEMOGRAPHIC CHANGE ALONE MAY DOUBLE THE RETIREE/WORKER RATIO

The potential effect of demographic change on future ratios of retirees to workers, holding other factors constant, may be approximated in various ways. The most commonly used indicator, as discussed in Chapter 7, is an older dependency ratio that compares one population segment (people aged 65 and over) with another (people aged 20 to 64). One variation in this measure, shown in Figure 10-1 for ten countries, allows for national differences in the average retirement age. This example is based on the average ages of retirement for men and women in 2005 estimated by OECD and population age and sex structures for 2005 and 2040 estimated and projected by the U.S. Census Bureau. The numerator of the ratio comprises all people at or over the average age of retirement in each country, and the denominator

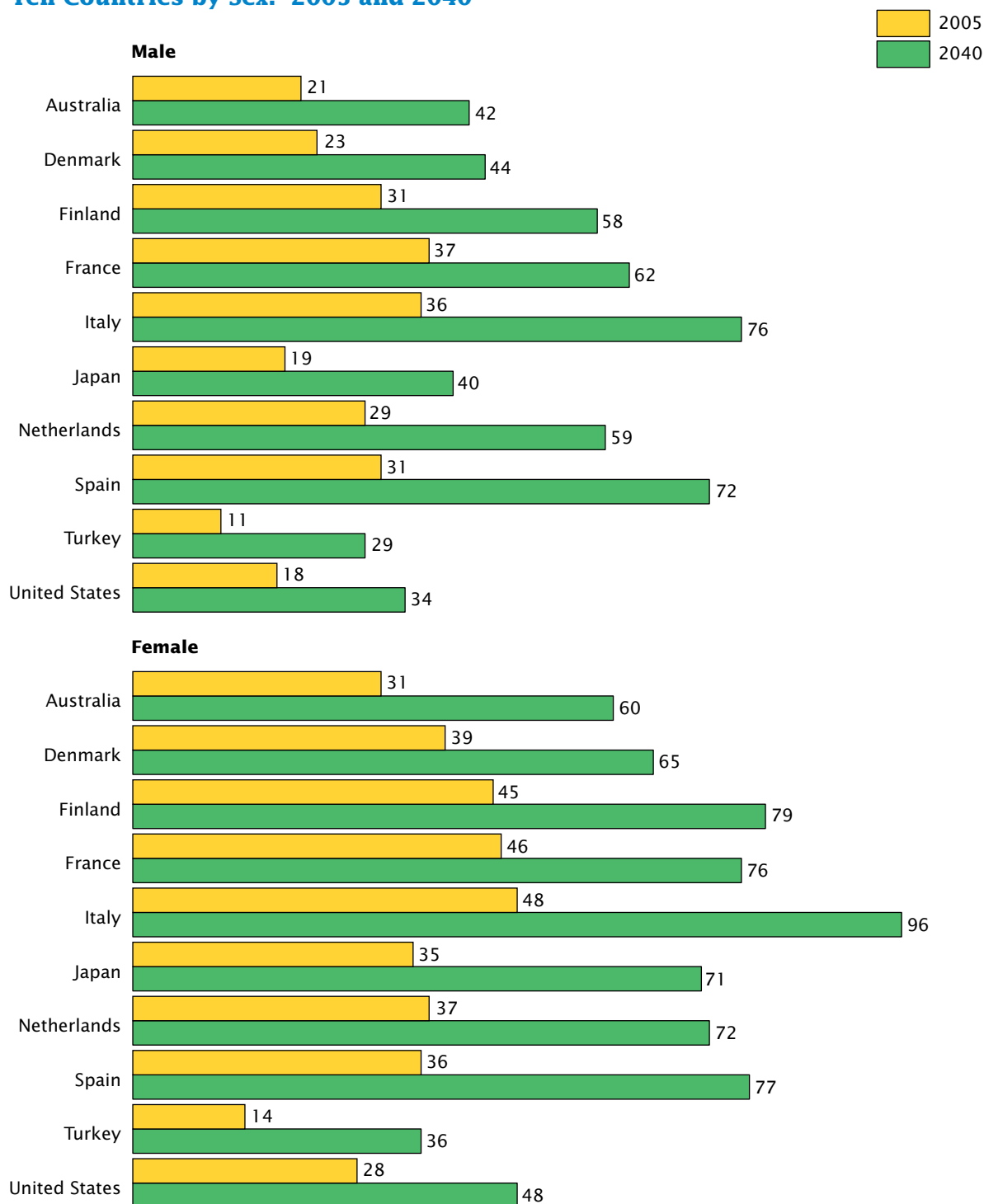
contains all people between the age of 20 and the average retirement age, assuming no change in the average age of retirement between 2005 and 2040. The ratio increases notably in all cases and more than doubles in Italy, Japan, Spain, and Turkey.

### NUMBER OF NATIONAL OLD-AGE SECURITY SYSTEMS RISING

Since World War II, public pension plans have played an increasingly important role in providing retirement income to older people. The number of countries with an old-age/disability/survivors program increased from 33 in 1940 to 167 in 2004 (Figure 10-2). While each national system has its own specific objectives, the goals of most public old-age pension schemes are to smooth consumption over an individual's lifetime and reduce or eliminate poverty among older people (Rofman, 2005).

Figure 10-1.

**Ratio of Retirement-Aged to Working-Aged Population for Ten Countries by Sex: 2005 and 2040**

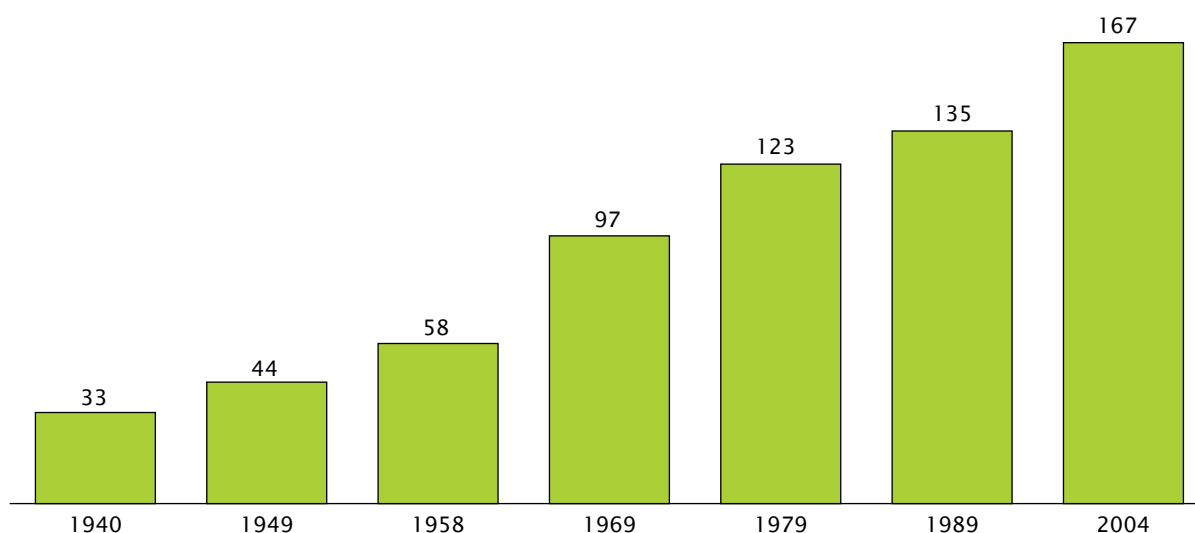


Notes: Ratios represent the number of people at or above the average effective retirement age per 100 people between age 20 and the average effective retirement age as calculated by OECD for 2005. Ratios for 2040 assume no change in the average age of retirement between 2005 and 2040.

Sources: U.S. Census Bureau, International Data Base, accessed on February 6, 2008; and Organisation for Economic Co-Operation and Development (OECD) estimates derived from the European and national labor force surveys.

Figure 10-2.

**Countries With Public Old-Age/Disability/Survivors Programs: 1940 to 2004**



Source: U.S. Social Security Administration, 2004 to 2006.

**PENSION COVERAGE  
SPOTTY AND DECLINING IN  
DEVELOPING COUNTRIES**

Mandatory old-age pension plans now cover more than 90 percent of the labor force in most developed countries where governments have undertaken mandating, financing, managing, and insuring public pensions. Public pension systems in developing countries usually cover a much smaller fraction of workers. In many cases, coverage is restricted to certain categories of workers, such as civil servants, military personnel, and employees in the formal economic sector. Rural, predominantly agricultural workers typically have little or no pension coverage, although some governments have

taken steps to address this situation (see Box 10-1).

Figure 10-3 shows the percentage of employed people paying contributions to the social security system in 13 Latin American countries in 2002. There are marked differences across countries, and the simple average is less than 40 percent. Further analysis of this dataset indicates that the average rural coverage is 22 percent, compared with 45 percent in urban areas, and that coverage in the nonwage urban informal sector (own-account workers, unpaid family workers, and owners of firms with fewer than five employees) is 14 percent (United Nations Economic Commission for Latin

America and the Caribbean, 2006). Other data for salaried workers only in 15 Latin American countries circa 2003 show that coverage was less than 60 percent in 10 of the countries (Rofman and Lucchetti, 2006). Compared with 1990, the levels of contributory social protection coverage declined among the employed population in Latin America and the Caribbean, generally. More broadly, a World Bank analysis in the mid-2000s suggests that the time trend in coverage levels under formal protection schemes in most developing countries has been stagnant or declining (Holzmann and Hinz, 2005).

Box 10-1.

### India's National Old Age Pension Scheme

Widespread social security nets are rare in most developing countries. The well-being of older citizens is seen mainly as the concern of families, while the state apportions its limited budget to strategic development goals, such as infrastructure, security, education, and health. India, however, which ranks among the world's poorer countries (almost 35 percent of the population lives on less than US\$1 a day; World Bank, 2008) and has the second-largest number of older people, provides some measure of relief to older people who have no means of economic or familial support.

The obligation of the government to take care of poor and older people is embodied in India's Constitution. Beginning in the 1980s, several Indian states developed noncontributory pension schemes for poor people at or above the age of 60 or 65, but there was no nationwide program. In 1995, the Indian government launched the National Social Assistance Program, one component of which was the National Old Age Pension Scheme (NOAPS), designed to assist destitute older people. This program originally was fully funded by the national government, which laid down norms and guidelines and assisted states and territories in their implementation. The number of old-age pensions disbursed in a state is dependent on a ceiling specified by the national government. Union territories have the lowest ceilings, while Uttar Pradesh, Bihar, and Maharashtra have the highest. In 1995, the ceiling for all of India was set at 5.4 million recipients, on the presumption that about 50 percent of people aged 65 and over lived below the poverty line and would qualify for these pensions. Pensions are disbursed through municipalities in towns and through "panchayats" in villages (India Ministry of Rural Development, <[www.drd.nic.in/Guide/gnsap.htm](http://www.drd.nic.in/Guide/gnsap.htm)>).

The amount received by pensioners from the national government increased from 75 rupees per month in 1995 to 200 rupees per month (equivalent to US\$5.00 in 2008) in 2006. States were encouraged to continue funding any prior schemes that they

may have had, such as an OAPS that some states instituted prior to 1995, as well as Widow Pension Schemes (Rajan, 2007). The result is variation in the overall pension level among states, coupled with variation in eligibility criteria. Most states have a residency requirement of 3 years, but some specify household income limits and others cover only those who have no source of income. In addition, the age at which people become eligible to receive this noncontributory pension may vary. In Haryana, for instance, the state-funded OAPS is given to destitute people aged 60 and over and was as high as 350 rupees per month in 2006; while in Jharkhand, which only has the NOAPS, seniors below the poverty line must be age 65 before they receive 200 rupees per month. Some states supplement monetary pensions with programs that provide food and clothing.

While there are no recent official estimates of the overall coverage of these pension schemes, estimates during the last two decades range from 10 percent to 25 percent (Rajan, 2007). An evaluation of the NOAPS in Andhra Pradesh suggests that its implementation has not been without problems. Pensioners often complained about being underpaid and a majority experienced delays in receiving their monthly pension. Most beneficiaries' names were not displayed on village notice boards as is required. Moreover, names often remained on the pension list long after individuals had passed away, denying access to pensions to newly eligible seniors. Overall, however, the program did seem to reach its target population, given that there were more female than male recipients and most of the beneficiaries belonged to scheduled castes and other minorities (Rao, 2006).

In November 2007, the basic pension amount was increased nationally to 400 rupees per month, to be financed in equal measure by the national government and each state. Coverage was extended to everyone aged 65 and over living below the poverty line, and the restriction of one pension recipient per household was eliminated (U.S. Social Security Administration, 2007). An estimated 15.7 million

Box 10-1.

### India's National Old Age Pension Scheme—Con.

people are entitled to the NOAPS in 2008, although some states have indicated that they may be unable to fund their half of the pension. The NOAPS is seen as just one pillar of older people's welfare. There is an effort by the national government, surrounded by much debate in the press, to pass a "Maintenance and Welfare of Parents and Senior Citizens Bill," whereby adult children will be obligated to look after their parents or other vulnerable senior relatives. The bill recommends the establishment of special tribunals at the district level that will have wide-ranging powers to order sons and daughters to provide need-based maintenance to their parents. In case of negligence, a person responsible for the upkeep of his or her parents is subject to punitive measures such as 3 months' imprisonment and a fine of 5,000 rupees. The bill also provides an option for parents to revoke their wills.

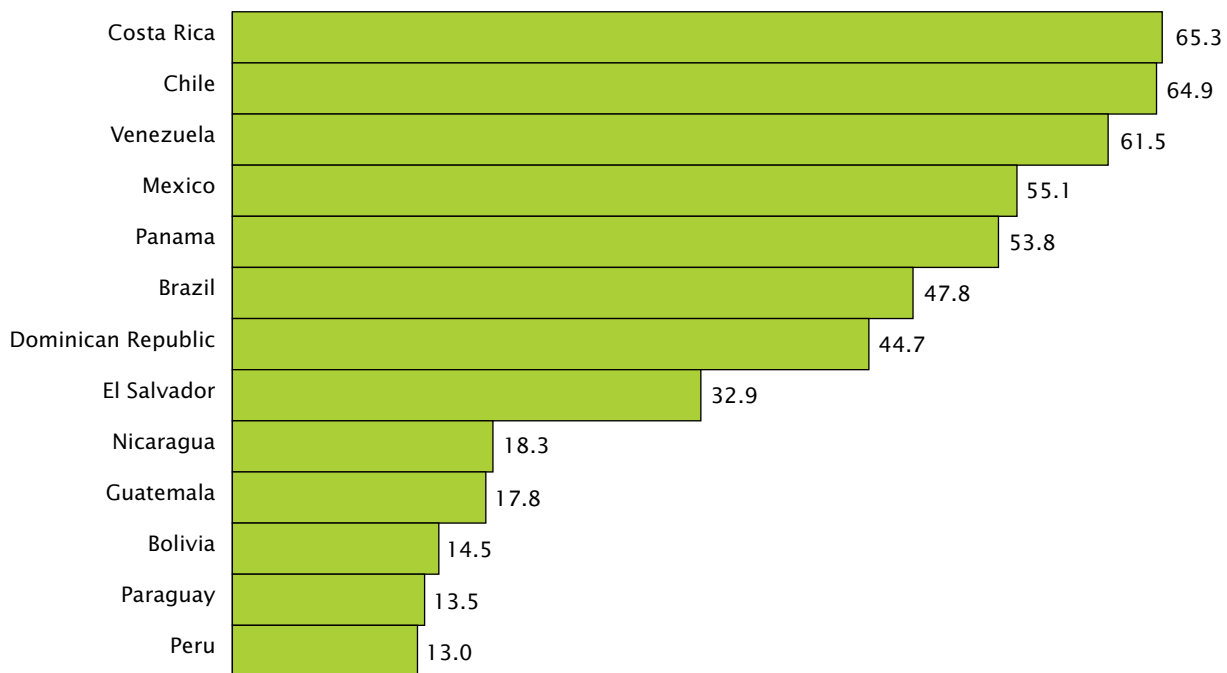
### FROM DEFINED BENEFIT TO DEFINED CONTRIBUTION

Public pension plans typically offer defined benefits that are not tied directly to individual contributions but are financed by payroll taxes. This arrangement is commonly referred to as a "pay-as-you-go" system insofar as current revenues (taxes on working adults) are used to finance the pension payments of people who are retired from the labor force. Most pay-as-you-go systems in industrialized countries initially promised generous benefits. These systems, at their inception, were designed for populations with a small number

Figure 10-3.

### Social Security Coverage in 13 Latin American Countries: Circa 2002

(Percentage of employed population paying contributions)



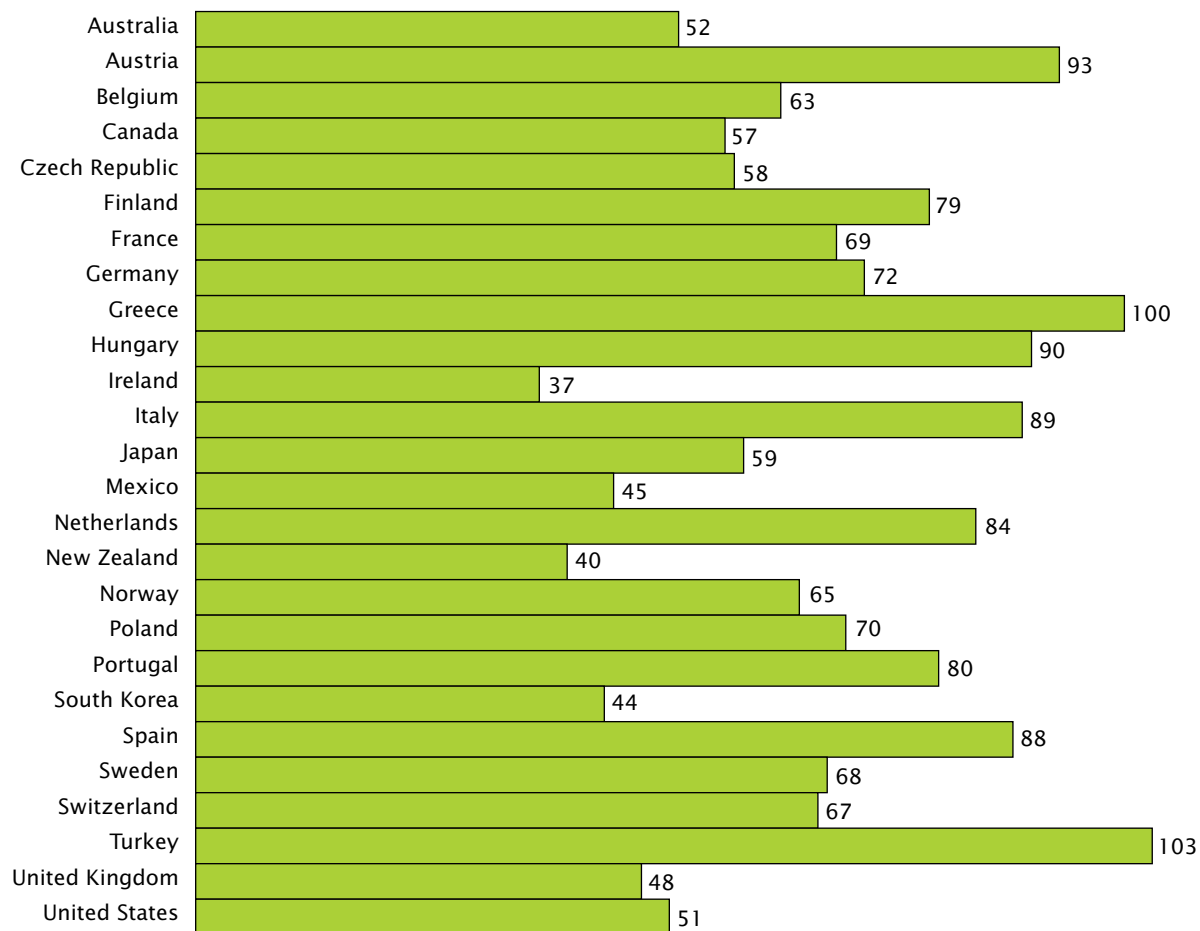
Note: Data for the Dominican Republic, Mexico, and Venezuela exclude own-account workers, unpaid family workers, and business owners.

Source: United Nations Economic Commission for Latin America and the Caribbean, 2006.

Figure 10-4.

# **Net Replacement Rate in Mandatory Pension Programs for Men in Selected Countries: 2005**

(Percent)



Note: Data refer to average individual pension entitlements as a percentage of preretirement earnings (net of taxes and contributions).

Source: Organisation for Economic Co-Operation and Development (OECD), 2005.

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.

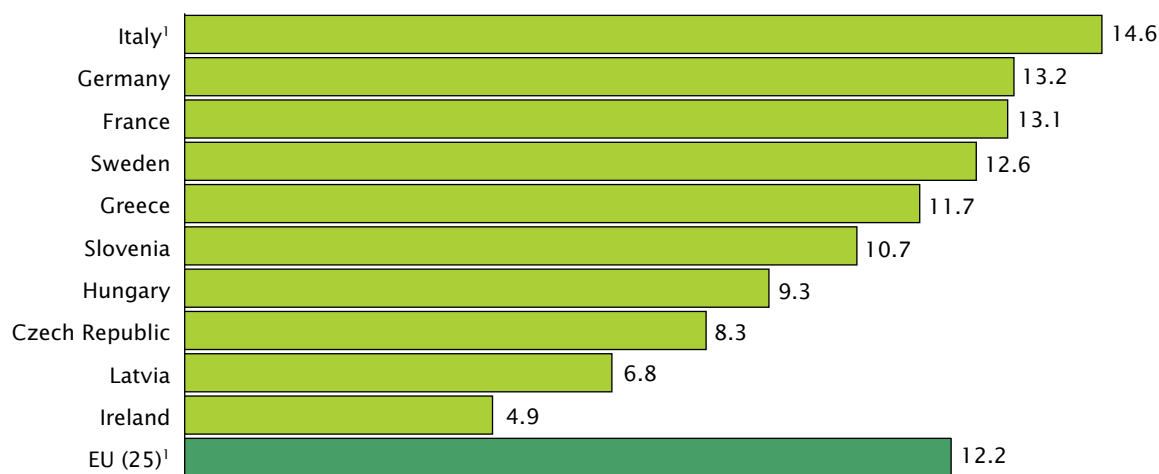
In response to challenges to their pension systems' solvency (such as the demographic change depicted in Figure 10-1), countries have adopted a wide range of pension reforms during the past 25 years.

Measures include increasing worker contribution rates, restructuring or reducing benefits, and raising the standard age of retirement (Holzmann and Stiglitz, 2001). Perhaps the most widespread (and often controversial) change is the rise of defined-contribution (DC) plans, which complement or replace defined-benefit (DB) schemes. In DC plans, contributions from workers (often supplemented by employers) flow into individual workers' accounts and

accumulate with interest over time. Upon retirement, the final amount usually is converted into a pension-income stream. Although a majority of OECD countries still have public DB plans, an increasing number have instituted mandatory DC schemes (OECD, 2007a). The change from DB to DC schemes is often seen at the company level as well. A survey by the Irish Association of Pension Funds (2007) showed that the share of firms offering only DB schemes

Figure 10-5.

### Pension Expenditure in Selected European Union Countries as a Percentage of GDP: 2004



<sup>1</sup> Figures for Italy and the total European Union (EU) 25-country aggregate are provisional.

Notes: GDP is gross domestic product. Pensions include old-age, anticipated old-age, partial, and disability, as well as early retirement benefits due to reduced capacity to work.

Source: Eurostat, <<http://epp.eurostat.ec.europa.eu>>, accessed on March 19, 2007.

dropped from two-thirds in 2002 to slightly more than one-third in 2007, while the number offering DC-only schemes jumped from 8 percent to 24 percent. DC plans now dominate among employer-sponsored pension plans in the United States (Cushing-Daniels and Johnson, 2008).

### HOW GENEROUS ARE PUBLIC PENSIONS?

The value of pensions can be construed and measured in different ways, depending on how many and which people in a given household rely on pension income, the taxable status of such income, the type of job a retiree was engaged in, the level of pension income in a given society relative to other benefits such as universal health care, and so forth. The concept of "replacement rate" is often used as a measure of how much of a

person's preretirement income is supplied by his or her pension. There is no single replacement rate in any national retirement program because rates vary depending on the type and duration of employment as well as the provisions of different plans. For comparative purposes, OECD constructs a replacement rate for average individual pension entitlements from mandatory pension programs as a percentage of preretirement earnings, net of taxes and contributions. Figure 10-4 shows that pensions for men in some countries can be expected to replace a large percentage of earnings and even to match or exceed the latter in Greece and Turkey. At the other end of the spectrum are Ireland and New Zealand, where mandatory-pension replacement rates are on the order of 40 percent. The unweighted average for the 26 countries in Figure 10-4 is 69.

### PUBLIC PENSIONS ABSORB ONE-EIGHTH OF GDP IN THE EUROPEAN UNION

The cost of public pensions generally is highest among industrial nations, most of which still have pay-as-you-go systems. Between 1960 and 1990, one-quarter of the increase in total public expenditures in OECD countries was growth in pension expenditure; on average, the latter grew twice as fast as did gross domestic product (GDP) (OECD, 1997). Calculations for 25 European Union nations in 2004 show a wide range of pension expenditure, with a weighted average of 12.2 percent of GDP and a high of nearly 15 percent in Italy (Figure 10-5). Pension expenditures accounted for 46 percent of all social protection expenditures in the European Union in 2004 (Eurostat, 2007a). Expenditure levels generally are lower in

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developing countries, where relatively younger populations and smaller pension programs do not yet place large demands on GDP.

### **MANDATORY PRIVATE PENSION PLANS BECOMING MORE PROMINENT**

A growing number of countries require workers to participate in some form of mandatory private pension plan. These may be personal (individual-based) or occupational (employer-based). Occupational plans are schemes generated by a company or organization for the benefit of its employees. Eleven OECD countries have instituted mandatory private pensions, most of the DC type, and coverage usually exceeds 90 percent of employees (OECD, 2007a). Most occupational plans are employer-specific, but in some nations (e.g., Denmark and the Netherlands), plans are organized on an industry-wide basis with compulsory participation the result of collective bargaining.

Occupational pension plans tend to be a more important source of retirement income than public pensions for high-income workers in developed countries. In the developing world, occupational

programs are found most frequently in former British colonies and in countries with large multinational subsidiaries (World Bank, 1994). Most of these programs are subject to less regulation and lower funding requirements than their counterparts in industrialized countries.

Another form of mandatory plan is the provident fund, a compulsory DC program wherein regular contributions are withheld from employee wages and invested for later repayment. Payouts typically are in the form of a lump sum upon retirement but may also be made earlier in times of special need (U.S. Social Security Administration, 2004–2006). Except in some Latin American countries, employers match or exceed the employee contribution. Traditional provident funds are state-run and centrally managed, though variations on this theme have emerged in Hong Kong and Thailand (Lindeman, 2002). Malaysia, in 1951, was the first nation to establish a wide-scale provident fund, and other Asian nations (e.g., India, Singapore, and Sri Lanka) have had provident funds for more than 45 years. By the mid-1990s, more than 20 nations had developed such plans. None of these countries had a public

pay-as-you-go system at the time its provident fund was established (World Bank, 1994). Where provident-fund coverage is extensive, such funds may, in effect, be the public pension system.

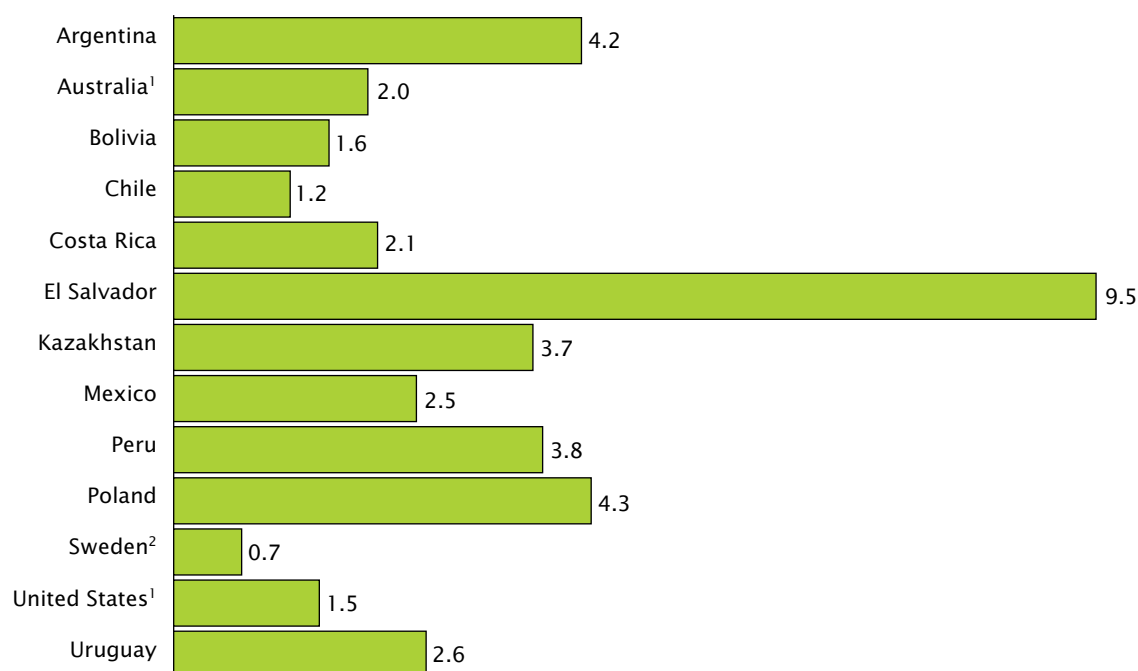
### **ADMINISTRATIVE COSTS OF PENSION SYSTEMS HIGH IN SOME DEVELOPING COUNTRIES**

The cost of administering a pension scheme is an important factor in the scheme's overall efficacy. Administrative costs can consume a significant portion of a worker's benefits. For example, if administrative expenses are 1 percent annually, they reduce a 4 percent rate of return by one-quarter (i.e., to 3 percent) and may reduce a final pension by 20 percent for a full-career worker who contributes throughout his or her working life (James, 2005). In many developing countries, administrative costs of publicly managed pension plans as a percentage of total old-age benefits historically have been high relative to those in the developed world; for example, 10 percent to 15 percent in Brazil and Turkey compared with less than 2 percent in most OECD countries (World Bank, 1994).



Figure 10-6.

**Administrative Costs as a Percentage of Assets in Privately Managed Plans for Selected Countries: 2002**



<sup>1</sup> Figures for Australia and the United States refer to the retail sector, 2001.

<sup>2</sup> Figure for Sweden refers to 2004.

Source: James, 2005.

Important factors in reducing the share of administrative costs over time include increases in total benefit expenditures, reflecting not only the maturation and/or expansion of programs but also the impact of inflation; government austerity programs targeted toward administrative overhead; and wider use of computers for processing

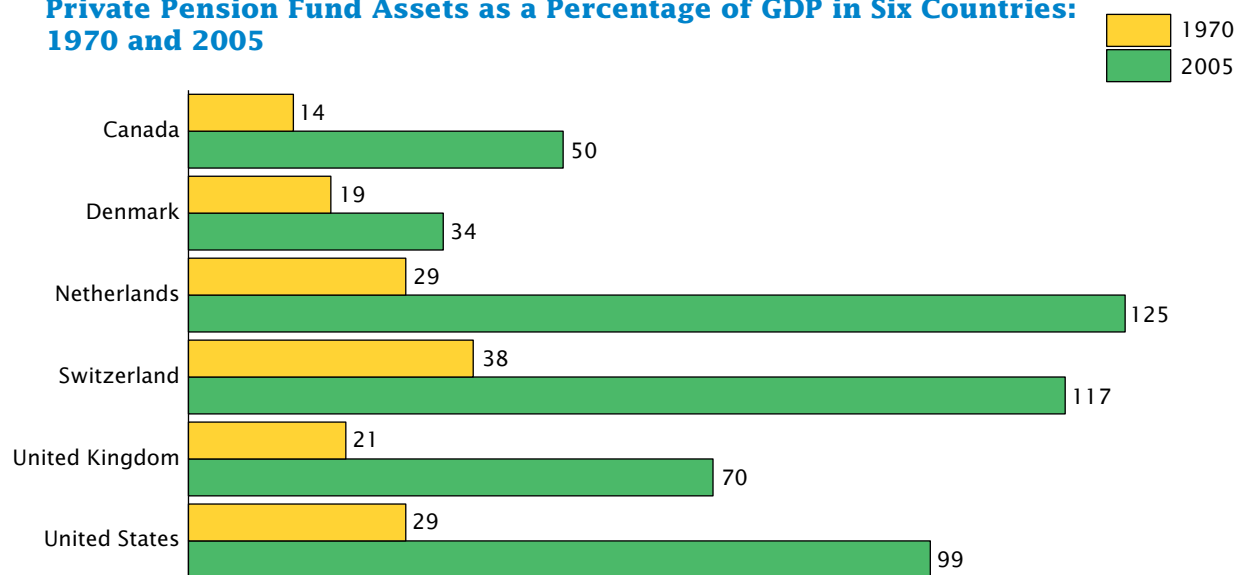
benefits, with corresponding gains in efficiency.

Concern has also been expressed about administrative costs associated with the rapid growth of privately managed retirement plans. Personal retirement account systems have high start-up costs in the form of record-keeping, communications, and marketing, and pension fund companies often run

deficits during their initial years of operation. As the volume of assets in a plan increases, economies of scale tend to lower administrative costs. One compilation of data for 13 countries (Figure 10-6) suggests that administrative costs in 2002 tended to be higher in developing countries compared with developed countries.

Figure 10-7.

**Private Pension Fund Assets as a Percentage of GDP in Six Countries: 1970 and 2005**



Note: GDP is gross domestic product.

Sources: World Bank, 1994; and Organisation for Economic Co-Operation and Development (OECD), 2007b.

**PRIVATE PENSION FUND ASSETS A MAJOR SOURCE OF LONG-TERM CAPITAL**

Private pension fund assets, accumulated within occupational and personal pension plans, are sizeable in many developed countries. These assets have grown substantially during the past three decades and in 2005 were equivalent to more than 115 percent of GDP in the Netherlands and Switzerland (Figure 10-7). In OECD countries as a whole, the 2005 weighted ratio of assets to GDP was 88 percent, and assets amounted to US\$18 trillion. The three largest pension markets

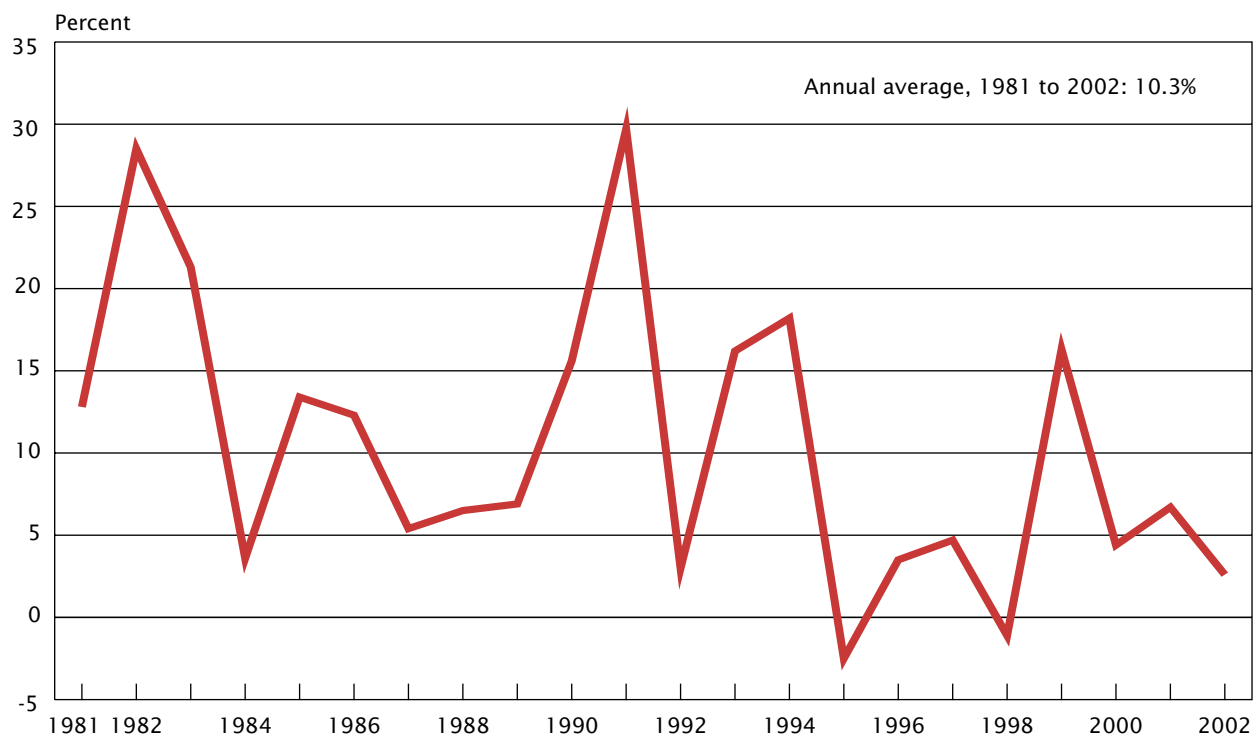
are in the United States, the United Kingdom, and Japan (OECD, 2007b).

Most occupational-plan assets have been invested in the private sector, are internationally diversified, and have earned higher returns than publicly managed funds. Such assets are subject to market fluctuations; for example, a downturn in equity markets in 2001–2002 resulted in a 13 percentage-point drop in the ratio of assets to GDP. This ratio rose as markets recovered, and the world's 300 largest funds added US\$1 trillion in 2005 and again in 2006 (Watson Wyatt Worldwide, 2007).

The growth of private pension assets is expected to continue. A looming policy question is whether population aging will depress rates of return on private pension funds. As large post-World War II cohorts move into retirement, they may begin to divest financial assets accumulated during their working years. This prospect highlights the importance of pension fund management, changes in government regulations, and varying sociocultural predispositions toward saving for retirement (National Research Council, 2001).

Figure 10-8.

### Real Rate of Return of Chile's Private Pension System: 1981 to 2002



Source: Williamson, 2005.

### TREND TOWARD PENSION PRIVATIZATION BEGAN IN CHILE

Chile first enacted a public pension scheme in 1911 and expanded its program following the European social insurance model financed on a pay-as-you-go basis. Between 1960 and 1980, the ratio of pensioners to contributing workers increased from 9 per 100 to 45 per 100 due to rapidly changing demographics and increasing tax evasion on the part of employees and employers (Williamson and Hochman, 1995). These changes, occurring in the context of a stagnant economy, resulted in a situation where the pension system was no longer able to meet current obligations. Faced with an increasingly bleak future scenario, the Chilean government in 1980 abandoned its

public system in favor of a compulsory savings plan administered by private sector companies.

Since 1981, all wage and salary earners are required to contribute 10 percent of their earnings to a privately administered retirement fund (additional payroll deductions are made for life insurance and fund expenses). Workers themselves select from many competing investment companies, are free to switch their accounts, and have several options for when to withdraw funds and how to receive benefits. The accounts are managed by pension funds subject to strict government guidelines designed to reduce mismanagement risks (James, 2007).

By most accounts, the Chilean experiment during its initial decade

was a success, with real annual returns on contributions averaging in excess of 12 percent during the 1980s. From 1995 to 2002, however, annual rates of return were generally much lower and in 2 years were negative. Overall, the long-term (22-year) average real return exceeded 10 percent (Figure 10-8). Elements of the system that have been criticized include high administrative costs, workers' loss of freedom over one-tenth of their earnings, stagnation of coverage rates, and eventual income replacement rates that are not guaranteed and rely on investment earnings that may suffer in times of economic stagnation (Soto, 2005; and United Nations Economic Commission for Latin America and the Caribbean, 2006). James (2007) points out that the

largest problem in Chile and other countries may be that many individuals do not contribute regularly or at all, and the government is unable to enforce contribution collections. Nevertheless, many countries in Latin America, Eastern Europe, and Asia have adopted aspects of the Chilean system or are experimenting with variations of it. Consideration of increased privatization of social security systems is now commonplace in much of the developed world as well (Holzmann and Hinz, 2005; Fox and Palmer, 2001).

## UNIVERSAL PENSIONS ADDRESS AGING AND POVERTY

The persistence of poverty in many countries, and in particular old-age poverty, has led to new approaches to dealing with old-age security. While most people receive pension income as a result of having worked and made contributions to a pension scheme, governments increasingly realize that economic systems may preclude this possibility for some segments of society. Most countries have some form of basic noncontributory pension for certain social groups, but eligibility criteria for the pension may differ greatly. An increasing number of countries have instituted, or are considering the introduction of, a non-means-tested pension as a way to mitigate poverty and provide at least a minimum level of subsistence for older people.

Willmore (2007) has developed a typology that identifies four types of noncontributory pensions. The most far-reaching is known as a universal non-means-tested

Table 10-1.

### Countries With Universal Non-Means-Tested Pensions: Circa 2003

Country	Qualifying age	Percent of population of qualifying age	Number of beneficiaries (in thousands)	Monthly pension (in U.S. dollars)
Bolivia .....	65	4.5	411	19
Botswana .....	65	5.0	85	30
Brunei .....	60	4.5	14	120
Kosovo .....	65	5.3	105	50
Mauritius <sup>1</sup> .....	60	9.2	116	61–262
Mexico, D.F. <sup>2</sup> .....	70	4.6	370	65
Namibia .....	60	6.0	98	23
Nepal .....	75	1.1	211	2
New Zealand <sup>3</sup> .....	65	12.0	446	554–737
Samoa .....	65	6.4	11	33

<sup>1</sup> Pension in Mauritius increases with age of pensioner.

<sup>2</sup> Data for Mexico, D.F., refer to Mexico City.

<sup>3</sup> In New Zealand, qualifying couples receive \$554 each, and a single pensioner receives \$737.

Source: Willmore, 2007.

pension, with benefits available to people based only on residence, age, and citizenship. Table 10-1 provides information for the nine countries and one city that provided universal non-means-tested pensions in the mid-2000s. In each case, pensions are paid to all who meet age and residency (and in some cases citizenship) requirements regardless of their assets or other income. Other types of noncontributory pensions are residence-based pensions, which usually require long periods (e.g., 40 years) of adult residency; recovery-conditioned pensions, where the receipt of pension income reduces other amounts of income that an individual might receive from earnings or private pensions; and social assistance pensions, which are means-tested programs that typically target benefits to people living in poverty.

According to the United Nations Department of Economic and Social Affairs, there are many questions about the impact of universal pensions. They may be expensive

when used as a core element of old-age security in a given country, and they may discourage participation in contributory programs. There are large gaps in knowledge about administrative costs, optimal institutional arrangements, take-up rates, and behavioral and incentive effects (i.e., does a universal pension reduce private intergenerational transfers and/or reduce labor supply?). On balance, however, such pensions appear to have the measurable effect of reducing poverty (United Nations Department of Economic and Social Affairs, 2007a). Evidence from South Africa suggests that an old-age social pension not only has direct economic benefits for households with older people but also increases labor supply by improving the child-care capacity of grandparents, thereby freeing younger household members for paid employment. Money from social pensions may also be used to temporarily support younger household members who migrate in search of employment (Ardington, Case, and Hosegood, 2007).

Box 10-2.

## China—Rethinking Social Security in an Emerging Market Economy

Although China is rapidly urbanizing, it remains a predominately rural country. The majority of Chinese workers are not yet covered by any formal pension scheme (Dunaway and Arora, 2007). Among those who have been and are now covered, there has been a steady rise in the number receiving formal pensions during the last 25 years. Concurrently, the ratio of covered workers to pensioners has declined, a trend that threatens the well-being of the formal old-age security system (Figure 10-9).

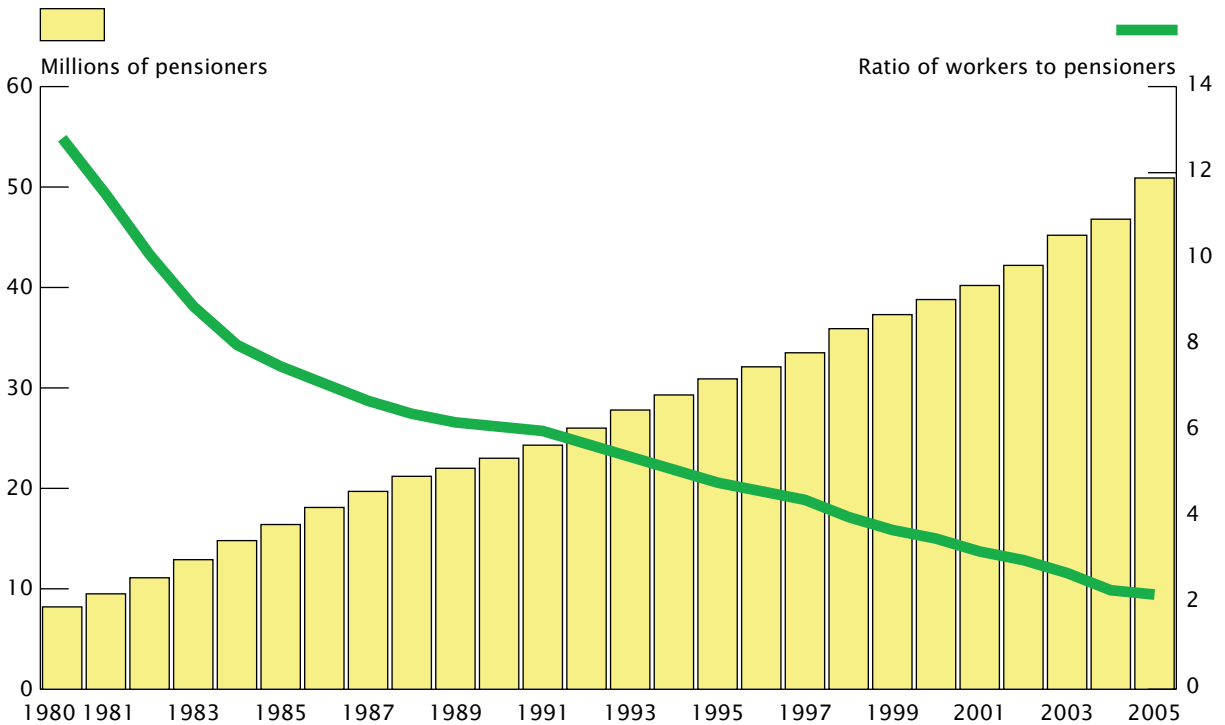
Social security reforms in China have been necessitated by the restructuring of state-owned enterprises and the many changes associated with movement toward a market economy. A new framework for old-age security began to emerge in the mid-1990s, and China remains in the process of developing the largest pension system in the world (see Salditt, Whiteford, and Adema [2007] for an overview). They describe the intent as basically twofold: (1) to replace

cradle-to-grave support provided by state-owned enterprises with an expansion of coverage beyond the state sector; and (2) to introduce pooled funding, which deflects risk. The new system includes a defined-benefit pension providing a 20 percent replacement rate of the average wage and a defined-contribution individual account. Owing to the unfunded liabilities of the former system, individual accounts have remained largely notional; today's workers continue to pay for today's pensioners.

New pressures have emerged in light of the rapid pace of population aging. Research supports a higher retirement age to counter the rising ratio of pensioners to workers. The government now is considering conversion to a system with a fully funded component and how to transition to a new system. Another challenge with this approach is where to invest funds that will accumulate in individual accounts, given that China's capital markets are relatively immature.

Figure 10-9.

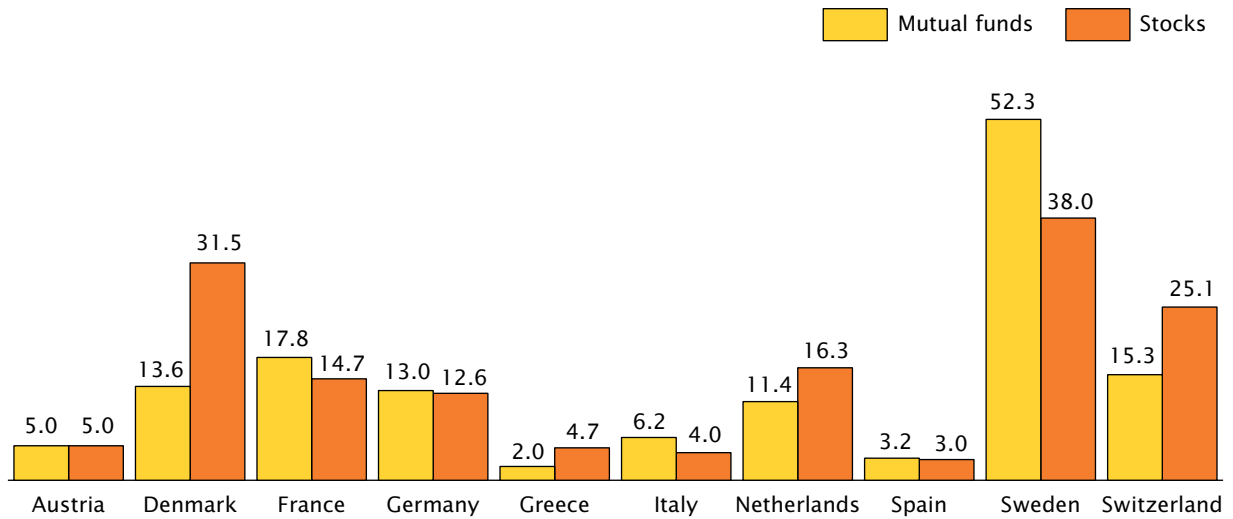
### China's Declining Ratio of Covered Workers to Pensioners: 1980 to 2005



Sources: *China Labour Statistical Yearbook*, various years; and *China Statistical Abstract*, 2006.

Figure 10-10.

**Percentage of Households With Members Aged 50 and Over Owning Mutual Funds and Stocks for Ten Countries: 2004**



Source: Borsch-Supan et al., 2005.

**GOVERNMENTS  
CONSIDERING NEW PILLARS  
OF OLD-AGE SECURITY**

In a 1994 report, the World Bank formulated its view of global pension reform and recommended that governments promote three pillars of old-age economic security: (1) a mandated, unfunded, and publicly managed DB (pay-as-you-go) system; (2) a mandated, funded, and privately managed DC scheme; and (3) voluntary personal retirement savings. Many countries now embrace the concept of a fourth pillar that includes nontraditional sources of old-age income, such as work (well beyond the “normal” retirement age) and the use of home equity, as well as income protection and the potential to encourage wealth transfer through the use of products such as life insurance and long-term care insurance. The World Bank has revised its original formulation into a five-pillar system that adds a basic (zero) pillar to address issues of extreme poverty (through, for example, universal pensions) and a nonfinancial fourth

pillar that includes access to family and other informal support as well as social programs for health care, housing, and home ownership (Holzmann and Hinz, 2005; and World Bank, 2007).

Given the maturation of public pension systems, increases in levels of female labor force participation, and the development of private pension schemes, there is a perception in some countries that older people on the whole are now faring better than previous generations of older people and younger population subgroups (Schulz and Binstock, 2006). 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. The life-cycle theory of consumption and savings posits that households accumulate wealth during working years to enable future consumption. In retirement, households tap that wealth to finance consumption. Individual life-cycle savings determine whether

households in that country are net savers or “dissavers” at any point in time. Gross savings rates are seen to vary substantially across countries and over time (Population Reference Bureau, 2007). The mix of retirement resources also varies enormously. Crossnational survey data from Europe (Borsch-Supan et al., 2005) reveal that 3 percent of Spanish households with at least one member aged 50 or older owned stocks in 2004, compared with 38 percent of Swedish households (Figure 10-10). A large percentage of household wealth in many countries is tied up in housing. This raises concerns that housing prices may fall as a large population of older people attempts to sell to a smaller population of younger people.<sup>1</sup> Such concerns have given rise to reverse mortgages and similar financial tools for tapping housing equity and avoiding unfavorable market conditions.

<sup>1</sup> Research in the United States suggests that, to date, most older Americans up to age 80 have not been converting their housing assets into other forms of income (Fisher et al., 2007).

## Concluding Remarks

This report has examined the demography of global population aging and considered many of the socioeconomic implications of demographic trends. In one sense, the reality of global aging represents a triumph of medical, social, and economic advances. In another sense, population aging produces myriad challenges to social insurance and pension schemes, health care systems, and existing models of social support. It affects economic growth, disease patterns and prevalence, and fundamental assumptions about growing older.

Population aging may fuel opportunities for economic growth and spur countries to develop new fiscal approaches to accommodate a changing world. While some governments have begun to plan for the long term, most have not, and reform becomes more difficult as the pace of population aging accelerates. In 2006, the European Commission submitted a report to European Finance Ministers that presented projections of economic and budgetary costs associated with population aging in European Union (EU) member states. The upshot of the report was that, given current policies, the costs of pensions, health care, and long-term care will lead to major increases in public spending in most member nations over the next half century. Gross domestic product growth rates are projected to fall across the EU, and in the absence of policy changes, the

potential EU economic growth rate would be cut in half by 2030. The EU report notes that, similar to the situation of an individual worker who delays saving until retirement is near, delays in planning for population aging at the national level would increase the costs of adjustment and shift the economic burden to the next generation of workers and taxpayers.

The financial and social implications of population aging have stimulated the expansion of research into new areas of inquiry, ranging from macroeconomic to genetic. A sampling of topics includes aging and capital markets (Borsch-Supan, 2006; and Groome, Blancher, and Ramlogan, 2006); the impact of alternative fiscal adjustment and reform strategies (Botman and Kumar, 2007); aging and global capital flows (Fehr, Jokisch, and Kotlikoff, 2003); implications of aging for national security policies (Haas, 2007); collection of biological (including genetic) data in population-based surveys (Weinstein, Vaupel, and Wachter, 2007); development of physiological indexes of aging based on biological markers (Gruenewald et al., 2006; and Seplaki et al., 2006); behavioral genomics and the life course (Hobcraft, 2007); neuroeconomics (Berns, Laibson, and Loewenstein, 2007); and a renewed interest in evaluating and quantifying well-being in older age (Schwarz, Kahneman, and Xu, forthcoming).

Much of the effort to better understand the paths and processes of aging, at both the individual and population level, is being spearheaded by crossnational and multidisciplinary research. The U.S. National Research Council has recommended crossnational research as a powerful tool that enhances the ability of policymakers to evaluate institutional and programmatic features of different national policies, and it has encouraged the development of multidisciplinary research designs to produce data to guide public policy (National Research Council, 2001). Toward this end, three notable efforts as described in Box 11-1 are underway, each of which relies on longitudinal data collection. The maturation of these studies will yield insights into the complex interrelationships among work, health, economic status, and family structure. The importance of such approaches is increasingly recognized throughout the world, as evidenced by the fact that numerous developing nations (e.g., Argentina, Chile, China, India, Mexico, and Thailand) have initiated or are planning studies that draw on the designs and experiences of the U.S. Health and Retirement Study (HRS); the English Longitudinal Study of Ageing (ELSA); and the Survey of Health, Ageing and Retirement in Europe (SHARE).



Box 11-1.

### New Data for an Aging World

At the G-8 meeting of the most industrialized countries in Denver in 1997, G-8 leaders highlighted the importance of population aging. The meeting communiqué encouraged nations to collaborate in biomedical and behavioral research and to learn from one another how policies and programs can advance structural reforms to preserve and strengthen pension, health, and long-term care systems.<sup>1</sup> The U.S. National Academy of Sciences subsequently recommended several strategies for enabling such research, with an emphasis on longitudinal data collection and multidisciplinary study design. With support from the U.S. National Institute on Aging, three important crossnational efforts have emerged to provide policymakers with hitherto unavailable information essential for understanding the complexities of our aging world.

The Survey of Health, Ageing and Retirement in Europe (SHARE) is a pan-European interdisciplinary longitudinal dataset covering people aged 50 and over. Modeled after the U.S. Health and Retirement Study (HRS) and the English Longitudinal Study on Ageing (ELSA), SHARE features harmonized cross-national data that allow comparison of the effects of different pension and health care systems on the lives of middle-aged and older citizens in the countries covered by SHARE, ELSA, and HRS. In 2004, a first wave of data from 30,000 respondents was collected in 11 European countries. The second wave of SHARE, in 2006–2007, incorporated four more countries in addition to the original 11. A third wave is currently in the design stage and is planned to

cover all 27 members of the European Union, plus Israel and Switzerland <[www.share-project.org/](http://www.share-project.org/)>.

The INDEPTH Network (International Network for the Demographic Evaluation of Populations and Their Health) comprises 40 sites in Africa, Asia, and Latin America that undertake prospective monitoring of populations living in defined geographic areas. Combining demographic surveillance with innovative techniques, such as verbal autopsy (a method of determining causes of death in populations lacking vital registration and medical certification), INDEPTH sites provide reliable mortality data that otherwise are lacking for much of the developing world, especially with regard to adult populations. The longitudinal nature of these data is essential to understanding emerging patterns of adult mortality and noncommunicable diseases, and this information will form the basis for development of much needed chronic disease prevention and control programs <[www.indepth-network.org/](http://www.indepth-network.org/)>.

The World Health Organization (WHO) has launched the Study of Global Ageing and Adult Health (SAGE), a longitudinal study in six countries (China, Ghana, India, Mexico, Russia, and South Africa) that builds upon prior data from the WHO World Health Survey 2002–2004. SAGE is designed to follow cohorts of individuals over age 50 for a period of 10 to 15 years in order to examine changes in health status and well-being and determine predictors of change, such as economic activity, transitions in life situations, and social cohesion. The SAGE will be linked to data from INDEPTH demographic surveillance sites in Asia and Africa to enhance the breadth and analytical potential of both datasets <[www.who.int/healthinfo/systems/sage/en/index.html](http://www.who.int/healthinfo/systems/sage/en/index.html)>.

<sup>1</sup> The communiqué is available at <[www.g8.fr/evian/english/navigation/g8\\_documents/archives\\_from\\_previous\\_summits/denver\\_summit\\_-\\_1997/communique.html](http://www.g8.fr/evian/english/navigation/g8_documents/archives_from_previous_summits/denver_summit_-_1997/communique.html)>.



## Country Composition of World Regions

Data for world regions in this report are, in most cases, aggregated from the International Data Base of the Population Division of the U.S. Census Bureau. The regions include the countries listed below. In some parts of this report, the discussion refers to a region as defined by another organization (for example, Western Europe might refer to a subset of member states of the Organisation for Economic Co-operation and Development or the European Union), as indicated by the corresponding reference citation.

### NORTHERN AFRICA

Algeria  
Egypt  
Libya  
Morocco  
Tunisia  
Western Sahara

### SUB-SAHARAN AFRICA

Angola	Namibia
Benin	Niger
Botswana	Nigeria
Burkina Faso	Rwanda
Burundi	Saint Helena
Cameroon	Sao Tome and Principe
Cape Verde	Senegal
Central African Republic	Seychelles
Chad	Sierra Leone
Comoros	Somalia
Congo (Brazzaville)	South Africa
Congo (Kinshasa)	Sudan
Cote d'Ivoire	Swaziland
Djibouti	Tanzania
Equatorial Guinea	Togo
Eritrea	Uganda
Ethiopia	Zambia
Gabon	Zimbabwe
Gambia, The	
Ghana	
Guinea	
Guinea-Bissau	
Kenya	
Lesotho	
Liberia	
Madagascar	
Malawi	
Mali	
Mauritania	
Mauritius	
Mayotte	
Mozambique	

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**ASIA  
(excluding Near East)**

Afghanistan  
Armenia  
Azerbaijan  
Bangladesh  
Bhutan  
Brunei  
Burma  
Cambodia  
China  
Georgia  
Hong Kong S.A.R.  
India  
Indonesia  
Iran  
Japan  
Kazakhstan  
Kyrgyzstan  
Laos  
Macau S.A.R.  
Malaysia  
Maldives  
Mongolia  
Nepal  
North Korea  
Pakistan  
Philippines  
Singapore  
South Korea  
Sri Lanka  
Taiwan  
Tajikistan  
Thailand  
Timor-Leste  
Turkmenistan  
Uzbekistan  
Vietnam

**EASTERN EUROPE**

Albania  
Belarus  
Bosnia and Herzegovina  
Bulgaria  
Croatia  
Czech Republic  
Estonia  
Hungary  
Latvia  
Lithuania  
Macedonia  
Moldova  
Montenegro  
Poland  
Romania  
Russia  
Serbia  
Slovakia  
Slovenia  
Ukraine

**WESTERN EUROPE**

Andorra  
Austria  
Belgium  
Denmark  
Faroe Islands  
Finland  
France  
Germany  
Gibraltar  
Greece  
Guernsey  
Iceland  
Ireland  
Isle of Man  
Italy  
Jersey  
Liechtenstein  
Luxembourg  
Malta  
Monaco  
Netherlands  
Norway  
Portugal  
San Marino  
Spain  
Sweden  
Switzerland  
United Kingdom

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## **LATIN AMERICA AND THE CARIBBEAN**

Anguilla  
Antigua and Barbuda  
Argentina  
Aruba  
Bahamas, The  
Barbados  
Belize  
Bolivia  
Brazil  
Cayman Islands  
Chile  
Colombia  
Costa Rica  
Cuba  
Dominica  
Dominican Republic  
Ecuador  
El Salvador  
Grenada  
Guatemala  
Guyana  
Haiti  
Honduras  
Jamaica  
Mexico  
Montserrat  
Netherlands Antilles  
Nicaragua  
Panama  
Paraguay  
Peru  
Puerto Rico  
Saint Barthelemy  
Saint Kitts and Nevis  
Saint Lucia  
Saint Martin  
Saint Vincent and the Grenadines  
Suriname  
Trinidad and Tobago  
Turks and Caicos Islands  
Uruguay  
Venezuela  
Virgin Islands, U.S.  
Virgin Islands, British

## **NEAR EAST**

Bahrain  
Cyprus  
Gaza Strip  
Iraq  
Israel  
Jordan  
Kuwait  
Lebanon  
Oman  
Qatar  
Saudi Arabia  
Syria  
Turkey  
United Arab Emirates  
West Bank  
Yemen

## **NORTHERN AMERICA**

Bermuda  
Canada  
Greenland  
Saint Pierre and Miquelon  
United States

## **OCEANIA**

American Samoa  
Australia  
Cook Islands  
Fiji  
French Polynesia  
Guam  
Kiribati  
Marshall Islands  
Micronesia, Federated States of  
Nauru  
New Caledonia  
New Zealand  
Northern Mariana Islands  
Palau  
Papua New Guinea  
Samoa  
Solomon Islands  
Tonga  
Tuvalu  
Vanuatu  
Wallis and Futuna

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APPENDIX B.

## Detailed Tables

Table B-1.  
**Total Population, Percent Older, and Percent Oldest Old by Country: 1950, 1980, 2010, and 2040**

(Numbers in thousands)

Country	1950				1980			
	Total population	65+ as a percent of total population	80+ as a percent of total population	80+ as a percent of 65+	Total population	65+ as a percent of total population	80+ as a percent of total population	80+ as a percent of 65+
<b>Western Europe</b>								
Austria . . . . .	6,935	10.4	1.2	11.5	7,549	15.4	2.7	17.5
Belgium . . . . .	8,628	11.0	1.4	12.7	9,828	14.4	2.6	18.1
Denmark . . . . .	4,271	9.1	1.2	13.2	5,123	14.4	2.9	20.1
France . . . . .	41,829	11.4	1.7	14.9	53,880	14.0	3.1	22.1
Germany . . . . .	68,376	9.7	1.0	10.3	78,289	15.6	2.8	17.9
Greece . . . . .	7,566	6.8	1.0	14.7	9,643	13.1	2.3	17.6
Italy . . . . .	47,104	8.3	1.1	13.3	56,434	13.1	2.2	16.8
Norway . . . . .	3,265	9.7	1.7	17.5	4,086	14.8	3.0	20.3
Sweden . . . . .	7,014	10.3	1.5	14.6	8,310	16.3	3.2	19.6
United Kingdom . . . . .	50,616	10.7	1.5	14.0	56,314	14.9	2.7	18.1
<b>Eastern Europe</b>								
Bulgaria . . . . .	7,251	6.7	0.7	10.4	8,862	11.9	1.6	13.4
Czech Republic . . . . .	8,925	8.3	1.0	12.0	10,284	13.4	1.9	14.2
Hungary . . . . .	9,338	7.3	0.8	11.0	10,707	13.4	2.1	15.7
Poland . . . . .	24,824	5.2	0.7	13.5	35,574	10.1	1.5	14.9
Russia . . . . .	102,702	6.2	0.9	14.5	138,655	10.2	1.4	13.7
Ukraine . . . . .	37,298	7.6	1.2	15.8	50,044	11.9	1.7	14.3
<b>Northern America/Oceania</b>								
Australia . . . . .	8,219	8.1	1.1	13.6	14,638	9.6	1.7	17.7
Canada . . . . .	13,737	7.7	1.1	14.3	24,516	9.4	1.8	19.1
New Zealand . . . . .	1,908	9.0	1.1	12.2	3,113	10.0	1.7	17.0
United States . . . . .	157,813	8.3	1.1	13.3	230,917	11.2	2.4	21.4
<b>Africa</b>								
Egypt . . . . .	21,834	3.0	0.2	6.7	43,674	3.9	0.4	10.3
Kenya . . . . .	6,077	3.9	0.3	7.7	16,282	3.0	0.3	10.0
Malawi . . . . .	2,881	3.1	0.2	6.5	6,215	2.8	0.3	10.7
Morocco . . . . .	8,953	2.9	0.2	6.9	19,567	4.2	0.6	14.3
South Africa . . . . .	13,683	3.6	0.3	8.3	29,074	3.1	0.4	12.9
Tunisia . . . . .	3,530	5.7	0.9	15.8	6,458	3.8	0.3	7.9
Uganda . . . . .	5,158	3.0	0.3	10.0	12,661	2.6	0.2	7.7
Zimbabwe . . . . .	2,747	3.2	0.2	6.3	7,285	2.9	0.3	10.3
<b>Asia</b>								
Bangladesh . . . . .	43,852	5.1	0.6	11.8	88,855	2.9	0.3	10.3
China . . . . .	554,760	4.5	0.3	6.7	998,877	4.7	0.4	8.5
India . . . . .	371,857	3.1	0.4	12.9	688,575	3.6	0.3	8.3
Indonesia . . . . .	79,538	4.0	0.3	7.5	151,108	3.4	0.3	8.8
Israel . . . . .	1,258	3.9	0.3	7.7	3,764	8.6	1.2	14.0
Japan . . . . .	83,625	4.9	0.4	8.2	116,807	9.0	1.4	15.6
Malaysia . . . . .	6,110	5.1	0.6	11.8	13,763	3.7	0.5	13.5
Pakistan . . . . .	36,944	5.3	0.5	9.4	79,222	3.4	0.4	11.8
Philippines . . . . .	19,996	3.6	0.4	11.1	48,088	3.2	0.3	9.4
Singapore . . . . .	1,022	2.4	0.4	16.7	2,415	4.7	0.5	10.6
South Korea . . . . .	18,859	3.0	0.2	6.7	38,124	3.8	0.4	10.5
Sri Lanka . . . . .	7,339	3.6	0.1	2.8	14,941	4.4	0.5	11.4
Thailand . . . . .	20,607	3.2	0.4	12.5	46,809	3.8	0.5	13.2
Turkey . . . . .	21,484	3.2	0.3	9.4	46,316	4.6	0.7	15.2
<b>Latin America/Caribbean</b>								
Argentina . . . . .	17,150	4.2	0.5	11.9	28,094	8.1	1.1	13.6
Brazil . . . . .	53,975	3.0	0.3	10.0	121,615	4.1	0.5	12.2
Chile . . . . .	6,082	4.3	0.5	11.6	11,174	5.5	0.9	16.4
Colombia . . . . .	12,568	3.1	0.3	9.7	28,356	3.8	0.5	13.2
Costa Rica . . . . .	966	4.8	0.5	10.4	2,347	4.7	0.8	17.0
Guatemala . . . . .	3,146	2.5	0.2	8.0	7,013	2.9	0.4	13.8
Jamaica . . . . .	1,403	3.9	0.2	5.1	2,133	6.7	1.5	22.4
Mexico . . . . .	27,741	3.5	0.6	17.1	69,325	3.7	0.6	16.2
Peru . . . . .	7,632	3.5	0.3	8.6	17,325	3.6	0.4	11.1
Uruguay . . . . .	2,239	8.2	1.4	17.1	2,914	10.5	1.7	16.2

Table B-1.  
**Total Population, Percent Older, and Percent Oldest Old by Country: 1950, 1980, 2010, and 2040—Con.**

(Numbers in thousands)

Country	2010				2040			
	Total population	65+ as a percent of total population	80+ as a percent of total population	80+ as a percent of 65+	Total population	65+ as a percent of total population	80+ as a percent of total population	80+ as a percent of 65+
<b>Western Europe</b>								
Austria . . . . .	8,214	18.1	5.0	27.7	7,867	29.9	9.5	31.9
Belgium . . . . .	10,423	17.8	5.3	29.6	10,206	27.3	9.4	34.6
Denmark . . . . .	5,516	16.6	4.2	25.2	5,691	25.0	8.1	32.6
France . . . . .	64,806	16.5	5.3	31.8	70,141	25.1	8.9	35.7
Germany . . . . .	82,283	20.4	5.2	25.3	76,815	30.3	10.1	33.4
Greece . . . . .	10,750	19.4	5.3	27.3	10,366	29.2	9.4	32.1
Italy . . . . .	58,091	20.3	6.0	29.6	53,232	32.6	10.4	31.8
Norway . . . . .	4,676	15.6	4.7	29.9	5,008	25.1	8.4	33.2
Sweden . . . . .	9,074	19.3	5.4	27.8	9,212	25.8	9.1	35.2
United Kingdom . . . . .	61,285	16.4	4.6	28.2	64,462	25.1	8.0	31.8
<b>Eastern Europe</b>								
Bulgaria . . . . .	7,149	17.9	4.0	22.4	5,305	28.3	9.0	31.9
Czech Republic . . . . .	10,202	15.9	3.9	24.5	9,115	28.5	9.3	32.6
Hungary . . . . .	9,880	16.0	3.7	23.5	8,830	25.5	8.2	32.2
Poland . . . . .	38,464	13.5	3.4	25.5	34,481	25.9	9.4	36.1
Russia . . . . .	139,390	13.3	3.0	22.8	116,553	22.8	7.2	31.5
Ukraine . . . . .	45,416	15.5	3.5	22.3	36,513	24.9	7.6	30.7
<b>Northern America/Oceania</b>								
Australia . . . . .	20,925	13.9	3.9	28.2	24,034	23.6	7.7	32.8
Canada . . . . .	34,253	14.2	4.0	28.6	40,479	24.4	8.3	34.1
New Zealand . . . . .	4,228	12.3	3.4	28.0	4,863	21.4	6.4	29.9
United States . . . . .	309,163	13.0	3.8	29.3	392,173	20.4	7.2	35.5
<b>Africa</b>								
Egypt . . . . .	84,440	4.9	0.6	12.1	119,470	11.8	2.4	20.3
Kenya . . . . .	40,047	2.7	0.4	13.7	60,317	6.0	1.0	17.1
Malawi . . . . .	14,613	2.7	0.3	10.6	26,024	2.8	0.5	17.6
Morocco . . . . .	35,301	5.2	0.8	15.8	48,238	12.4	2.4	19.1
South Africa . . . . .	43,333	5.8	1.0	16.7	35,390	10.0	2.8	27.8
Tunisia . . . . .	10,583	7.2	1.3	17.7	12,503	18.2	3.8	20.7
Uganda . . . . .	33,399	2.1	0.3	13.5	93,632	2.2	0.3	14.9
Zimbabwe . . . . .	12,516	3.6	0.6	18.1	12,545	5.0	1.4	28.2
<b>Asia</b>								
Bangladesh . . . . .	159,765	3.7	0.5	12.9	250,604	7.8	1.2	15.7
China . . . . .	1,347,563	8.3	1.4	16.7	1,454,619	22.6	5.0	22.3
India . . . . .	1,184,090	5.4	0.7	13.1	1,684,312	13.2	3.1	23.5
Indonesia . . . . .	242,968	6.1	0.8	13.6	304,686	14.7	3.1	21.2
Japan . . . . .	126,804	22.6	6.3	27.8	103,862	34.4	13.1	38.0
Israel . . . . .	6,645	10.0	2.8	28.5	8,271	17.3	5.2	30.0
Malaysia . . . . .	26,144	5.1	0.7	14.3	39,410	11.6	2.5	21.5
Pakistan . . . . .	173,814	4.4	0.6	14.3	256,974	8.6	1.5	16.9
Philippines . . . . .	95,868	4.4	0.6	14.7	137,829	10.1	2.0	19.8
Singapore . . . . .	4,701	9.0	2.4	26.5	5,003	33.2	10.0	30.1
South Korea . . . . .	49,568	10.4	1.9	18.0	48,330	28.9	8.4	29.1
Sri Lanka . . . . .	21,514	8.3	1.6	19.7	24,834	19.1	5.2	27.5
Thailand . . . . .	66,303	8.9	1.5	16.7	70,958	21.8	5.5	25.2
Turkey . . . . .	73,322	7.3	1.3	18.1	86,450	17.6	3.8	21.4
<b>Latin America/Caribbean</b>								
Argentina . . . . .	41,405	11.0	2.9	26.4	48,207	17.2	5.1	29.9
Brazil . . . . .	195,580	6.8	1.2	17.8	228,454	17.5	4.0	22.7
Chile . . . . .	16,720	9.2	1.7	18.7	19,281	19.3	5.3	27.5
Colombia . . . . .	46,271	5.8	0.9	16.1	62,108	15.0	3.4	22.7
Costa Rica . . . . .	4,306	6.3	1.2	19.2	5,554	16.3	4.0	24.6
Guatemala . . . . .	13,550	3.8	0.6	15.2	21,048	7.5	1.6	21.7
Jamaica . . . . .	2,843	7.5	1.8	23.9	3,368	11.3	2.9	25.9
Mexico . . . . .	112,469	6.4	1.3	21.1	143,026	15.5	3.9	25.2
Peru . . . . .	29,758	5.8	0.8	14.4	37,451	14.0	2.7	19.5
Uruguay . . . . .	3,510	13.4	3.6	26.6	3,827	19.7	5.8	29.5

Sources: United Nations Department of Economic and Social Affairs, 2007b; and U.S. Census Bureau, International Data Base, accessed on January 6, 2008.

Table B-2.

# Percent Change in Population for Older Age Groups by Country: 2000 to 2020 and 2020 to 2040

Country	2000 to 2020				2020 to 2040			
	55 to 64 years	65 to 79 years	80 years and over	65 years and over	55 to 64 years	65 to 79 years	80 years and over	65 years and over
<b>Western Europe</b>								
Austria .....	36.6	26.0	68.9	35.8	-22.4	31.2	54.7	37.9
Belgium .....	43.4	14.1	72.0	26.5	-17.1	17.5	51.6	27.4
Denmark .....	20.2	48.1	27.9	42.7	-15.7	11.3	71.7	25.8
France .....	50.4	29.1	77.4	40.4	-4.8	18.5	57.5	30.0
Germany .....	18.8	19.3	95.0	36.1	-26.0	23.7	32.3	26.5
Greece .....	22.5	8.6	94.6	26.3	6.8	29.3	31.6	30.0
Italy .....	24.9	10.1	84.7	26.7	-14.5	32.9	28.8	31.6
Norway .....	45.8	43.9	16.3	36.1	-11.5	19.7	85.9	35.8
Sweden .....	10.1	41.2	19.0	34.6	-10.0	1.5	54.7	15.5
United Kingdom .....	39.8	26.7	34.1	28.6	-9.3	26.0	60.9	35.3
<b>Eastern Europe</b>								
Bulgaria .....	-2.6	-2.7	86.5	9.4	0.4	-6.2	46.3	5.9
Czech Republic .....	17.2	42.3	89.1	50.3	17.3	4.4	84.6	21.6
Hungary .....	5.0	19.3	70.8	28.1	17.3	4.4	67.0	18.9
Poland .....	53.8	36.1	111.2	48.5	14.0	6.1	94.2	26.9
Russia .....	30.5	2.2	82.4	15.1	-9.5	15.5	55.3	25.6
Ukraine .....	6.2	-3.8	82.9	9.9	-5.1	12.8	40.1	20.0
<b>Northern America/Oceania</b>								
Australia .....	63.8	63.2	72.2	65.4	-0.3	29.0	88.4	43.8
Canada .....	87.3	69.6	71.7	70.1	-7.4	28.6	99.4	46.4
New Zealand .....	53.6	55.6	55.6	55.6	21.0	42.0	81.9	52.0
United States .....	75.0	59.7	44.9	55.8	-2.6	25.3	111.8	46.5
<b>Africa</b>								
Egypt .....	99.7	120.4	250.9	132.5	70.5	98.7	211.3	114.4
Kenya .....	111.4	95.9	118.7	98.8	128.1	118.9	177.5	127.1
Malawi .....	32.3	60.7	135.4	67.3	73.7	34.7	103.2	43.2
Morocco .....	120.7	75.1	127.1	82.5	72.0	132.4	155.7	136.5
South Africa .....	22.6	46.3	84.2	52.0	-1.8	2.4	77.6	16.1
Tunisia .....	113.0	58.6	161.3	72.2	56.8	127.0	135.8	128.7
Uganda .....	84.2	51.2	123.4	59.2	112.9	128.6	119.9	127.2
Zimbabwe .....	9.9	25.8	75.2	33.6	56.6	11.0	66.4	22.5
<b>Asia</b>								
Bangladesh .....	104.3	109.6	70.5	103.8	110.9	115.8	181.2	124.0
China .....	93.4	86.6	138.5	93.7	5.7	81.0	154.3	93.5
India .....	85.1	104.6	234.9	118.9	64.2	110.0	220.4	128.5
Indonesia .....	92.7	89.8	230.8	105.3	45.0	109.1	160.0	118.2
Israel .....	76.6	59.4	59.5	59.4	36.9	42.9	94.6	55.2
Japan .....	-9.3	39.3	127.4	58.7	1.4	-6.1	25.2	3.8
Malaysia .....	120.4	135.0	178.4	140.9	41.1	99.3	194.7	114.2
Pakistan .....	86.0	64.1	101.3	69.1	95.7	120.0	134.1	122.3
Philippines .....	109.3	110.9	136.2	114.5	71.5	108.0	179.2	119.0
Singapore .....	230.7	158.2	177.3	162.3	-13.8	101.6	194.8	122.8
South Korea .....	100.8	101.9	240.3	122.3	-6.9	71.0	140.8	86.7
Sri Lanka .....	99.2	94.3	152.6	103.5	28.9	60.8	150.4	78.3
Thailand .....	90.0	98.1	190.1	111.1	15.8	68.5	135.8	81.6
Turkey .....	100.4	74.5	147.9	85.7	50.6	106.0	120.3	108.9
<b>Latin America/Caribbean</b>								
Argentina .....	42.0	40.0	75.7	47.9	45.9	38.6	66.4	45.9
Brazil .....	104.9	104.5	156.6	112.4	44.3	92.3	150.0	102.9
Chile .....	82.9	93.5	138.5	101.1	13.2	53.2	135.7	69.5
Colombia .....	142.0	111.5	187.4	121.2	24.6	108.2	206.2	124.5
Costa Rica .....	147.1	117.3	126.5	118.9	36.6	98.8	185.4	114.8
Guatemala .....	91.8	104.6	147.8	109.8	94.4	79.9	199.9	97.0
Jamaica .....	40.0	27.5	53.8	33.3	65.8	52.7	56.8	53.7
Mexico .....	103.8	101.0	138.4	108.5	47.7	109.5	135.5	115.5
Peru .....	98.8	96.9	161.8	105.1	47.9	102.9	153.3	111.1
Uruguay .....	29.2	12.2	60.9	22.5	24.5	38.5	50.9	41.9

Source: U.S. Census Bureau, International Data Base, accessed on January 6, 2008.

Table B-3.  
**Median Age by Country: 2000, 2020, and 2040**

(In years)

Country	2000	2020	2040
<b>Western Europe</b>			
Austria . . . . .	38	46	49
Belgium . . . . .	39	44	47
Denmark . . . . .	38	43	44
France . . . . .	37	42	44
Germany . . . . .	40	47	50
Greece . . . . .	39	46	50
Italy . . . . .	40	48	52
Norway . . . . .	37	42	44
Sweden . . . . .	40	43	46
United Kingdom . . . . .	38	42	45
<b>Eastern Europe</b>			
Bulgaria . . . . .	40	45	52
Czech Republic . . . . .	38	45	52
Hungary . . . . .	38	43	49
Poland . . . . .	35	42	50
Russia . . . . .	37	41	47
Ukraine . . . . .	38	42	50
<b>Northern America/Oceania</b>			
Australia . . . . .	35	40	44
Canada . . . . .	37	42	45
New Zealand . . . . .	33	38	43
United States . . . . .	35	38	39
<b>Africa</b>			
Egypt . . . . .	22	28	35
Kenya . . . . .	18	21	30
Malawi . . . . .	17	18	21
Morocco . . . . .	22	29	36
South Africa . . . . .	23	28	32
Tunisia . . . . .	25	35	43
Uganda . . . . .	15	15	17
Zimbabwe . . . . .	19	22	26
<b>Asia</b>			
Bangladesh . . . . .	20	26	30
China . . . . .	30	37	45
India . . . . .	23	28	35
Indonesia . . . . .	25	31	38
Israel . . . . .	28	33	39
Japan . . . . .	41	49	54
Malaysia . . . . .	23	28	32
Pakistan . . . . .	19	25	33
Philippines . . . . .	21	26	32
Singapore . . . . .	34	45	53
South Korea . . . . .	32	43	50
Sri Lanka . . . . .	28	35	41
Thailand . . . . .	29	38	44
Turkey . . . . .	26	34	42
<b>Latin America/Caribbean</b>			
Argentina . . . . .	28	34	40
Brazil . . . . .	26	34	41
Chile . . . . .	29	35	42
Colombia . . . . .	25	30	36
Costa Rica . . . . .	25	32	39
Guatemala . . . . .	18	23	30
Jamaica . . . . .	22	27	35
Mexico . . . . .	23	30	37
Peru . . . . .	24	30	38
Uruguay . . . . .	32	36	42

Source: U.S. Census Bureau, International Data Base, accessed on January 6, 2008.



Table B-4.  
**Sex Ratio for Population 35 Years and Over by Age and Country: 2000, 2020, and 2040**

(Men per 100 women)

Country	2000				2020				2040			
	35 to 49 years	50 to 64 years	65 to 79 years	80 years and over	35 to 49 years	50 to 64 years	65 to 79 years	80 years and over	35 to 49 years	50 to 64 years	65 to 79 years	80 years and over
<b>Western Europe</b>												
Austria . . . . .	104	97	69	40	98	99	86	57	99	96	87	62
Belgium . . . . .	103	98	78	43	102	99	87	52	103	100	88	59
Denmark . . . . .	103	100	82	49	97	99	90	59	99	94	89	62
France . . . . .	98	97	77	46	102	95	87	55	103	100	88	59
Germany . . . . .	105	99	72	36	106	102	86	56	106	103	90	60
Greece . . . . .	100	95	84	68	99	97	87	62	97	96	89	63
Italy . . . . .	101	94	77	50	108	101	84	55	112	107	93	60
Norway . . . . .	104	102	81	50	100	101	93	57	100	98	91	63
Sweden . . . . .	104	101	83	53	102	100	92	61	102	98	91	63
United Kingdom . . . . .	102	98	82	47	105	101	88	59	104	103	93	62
<b>Eastern Europe</b>												
Bulgaria . . . . .	96	90	76	63	100	88	73	48	102	97	78	48
Czech Republic . . . . .	102	93	67	42	104	98	79	46	106	101	88	53
Hungary . . . . .	97	84	63	43	102	90	68	38	104	96	79	44
Poland . . . . .	100	89	66	44	101	93	75	45	103	97	82	51
Russia . . . . .	95	78	49	23	92	76	53	27	103	85	58	31
Ukraine . . . . .	92	77	54	29	94	79	58	31	103	90	64	34
<b>Northern America/Oceania</b>												
Australia . . . . .	101	101	86	55	102	98	88	63	102	99	89	65
Canada . . . . .	101	98	82	52	102	98	86	57	102	99	87	62
New Zealand . . . . .	98	98	87	53	103	99	87	61	103	100	91	63
United States . . . . .	98	94	79	50	101	95	84	57	101	98	87	64
<b>Africa</b>												
Egypt . . . . .	99	94	80	56	104	97	81	47	103	99	90	52
Kenya . . . . .	93	89	90	91	107	94	78	72	104	103	92	62
Malawi . . . . .	94	87	80	69	117	89	67	59	117	107	83	47
Morocco . . . . .	97	86	84	81	100	94	80	59	101	97	85	63
South Africa . . . . .	88	80	70	51	128	74	56	46	142	127	71	39
Tunisia . . . . .	98	91	99	117	102	97	84	77	105	100	90	69
Uganda . . . . .	100	77	85	92	105	100	69	58	105	99	88	58
Zimbabwe . . . . .	80	85	102	93	143	76	52	69	159	143	88	39
<b>Asia</b>												
Bangladesh . . . . .	104	116	118	128	104	102	108	111	104	102	94	91
China . . . . .	106	108	95	61	104	103	94	67	110	102	91	64
India . . . . .	107	105	95	78	105	102	92	66	108	103	91	63
Indonesia . . . . .	94	92	87	68	105	96	79	59	103	101	89	55
Israel . . . . .	99	93	77	70	104	99	85	64	104	101	92	67
Japan . . . . .	101	97	80	47	104	99	86	55	104	101	91	57
Malaysia . . . . .	95	98	80	64	103	93	81	60	104	100	85	57
Pakistan . . . . .	103	97	98	89	106	101	85	72	105	103	93	67
Philippines . . . . .	94	91	79	71	102	92	78	61	104	99	85	59
Singapore . . . . .	97	102	85	58	91	91	92	65	99	92	80	68
South Korea . . . . .	102	97	68	39	104	98	85	50	109	103	87	59
Sri Lanka . . . . .	92	92	95	91	95	88	82	71	98	93	81	60
Thailand . . . . .	94	94	87	68	100	89	85	70	103	97	82	66
Turkey . . . . .	105	97	90	62	102	103	89	64	102	99	92	66
<b>Latin America/Caribbean</b>												
Argentina . . . . .	100	94	75	56	100	95	80	54	103	97	83	58
Brazil . . . . .	97	89	73	50	98	92	77	52	101	94	80	55
Chile . . . . .	99	92	77	46	101	96	82	51	103	98	86	58
Colombia . . . . .	94	83	84	71	94	90	75	56	97	92	80	54
Costa Rica . . . . .	98	99	91	71	104	97	89	68	103	102	90	66
Guatemala . . . . .	94	99	88	77	88	87	88	68	96	89	77	62
Jamaica . . . . .	97	97	86	67	99	94	87	67	103	98	85	65
Mexico . . . . .	90	90	86	78	92	85	81	69	97	89	80	61
Peru . . . . .	101	99	90	75	100	99	92	76	101	98	90	73
Uruguay . . . . .	95	89	75	52	102	93	76	49	102	99	85	52

Source: U.S. Census Bureau, International Data Base, accessed on January 6, 2008.

Table B-5

**Total and Older Urban<sup>1</sup> Population by Sex and Country: Selected Years 1969 to 2005**

(Numbers in thousands)

Country and year	Male			Female			65 and over sex ratio <sup>2</sup>
	All ages	65 and over	65+ as a percent of total population	All ages	65 and over	65+ as a percent of total population	
Western Europe							
Austria							
1971.....	1,763	224	12.7	2,104	403	19.2	55
1981.....	1,920	245	12.7	2,241	463	20.7	53
1991.....	2,386	272	11.4	2,646	534	20.2	51
2001.....	2,565	313	12.2	2,804	536	19.1	58
Denmark <sup>3</sup>							
1970.....	1,923	207	10.8	2,024	290	14.3	71
1981.....	2,090	251	12.0	2,208	376	17.0	67
France							
1975.....	18,659	1,859	10.0	19,729	3,055	15.5	61
1982.....	19,239	1,912	9.9	20,560	3,205	15.6	60
1990.....	20,194	2,237	11.1	21,729	3,626	16.7	62
1999.....	21,240	2,785	13.1	22,951	4,273	18.6	65
Greece							
1971.....	2,782	240	8.6	2,904	317	10.9	76
1981.....	3,312	316	9.5	3,478	414	11.9	76
1991.....	2,914	302	10.4	3,125	413	13.2	73
2001.....	4,016	518	12.9	4,191	668	15.9	78
Norway							
1970.....	1,242	122	9.8	1,313	183	13.9	67
1980.....	1,410	133	9.4	1,484	212	14.3	63
1990.....	1,489	188	12.7	1,568	287	18.3	66
2001.....	1,694	199	11.8	1,765	299	16.9	67
Sweden <sup>4</sup>							
1970.....	3,232	343	10.6	3,343	474	14.2	72
1975.....	3,328	404	12.1	3,462	564	16.3	72
1980.....	3,379	453	13.4	3,535	642	18.2	71
1990.....	3,495	518	14.8	3,670	754	20.5	69
Eastern Europe							
Bulgaria							
1975.....	2,518	174	6.9	2,544	218	8.6	80
1987.....	2,923	221	7.6	2,998	282	9.4	78
1996.....	2,741	273	10.0	2,893	364	12.6	75
2004.....	2,622	299	11.4	2,815	438	15.5	68
Czech Republic							
1994.....	3,731	365	9.8	3,989	602	15.1	61
1996.....	3,720	379	10.2	3,975	618	15.5	61
2004.....	3,641	408	11.2	3,889	645	16.6	63
Hungary							
1970.....	2,218	205	9.3	2,449	326	13.3	63
1980.....	2,734	284	10.4	2,968	448	15.1	63
1988.....	3,001	289	9.6	3,285	487	14.8	59
1996.....	3,038	332	10.9	3,405	559	16.4	59
2004.....	3,134	379	12.1	3,551	654	18.4	58
Poland							
1970.....	8,167	464	5.7	8,887	848	9.5	55
1978.....	9,667	660	6.8	10,473	1,171	11.2	56
1988.....	11,120	717	6.4	12,054	1,286	10.7	56
1996.....	11,430	917	8.0	12,467	1,560	12.5	59
2004.....	11,163	1,117	10.0	12,327	1,876	15.2	60

See footnotes at end of table.

Table B-5

**Total and Older Urban<sup>1</sup> Population by Sex and Country: Selected Years 1969 to 2005—Con.**

(Numbers in thousands)

Country and year	Male			Female			65 and over sex ratio <sup>2</sup>
	All ages	65 and over	65+ as a percent of total population	All ages	65 and over	65+ as a percent of total population	
Eastern Europe—Con.							
Russia							
1970.....	36,931	1,432	3.9	43,700	3,909	8.9	37
1979.....	43,755	2,300	5.3	51,188	5,966	11.7	39
1989.....	50,333	2,566	5.1	57,626	6,960	12.1	37
1995.....	50,405	3,684	7.3	57,374	8,330	14.5	44
2004.....	48,453	4,314	8.9	56,816	9,202	16.2	47
Ukraine							
1970.....	11,823	586	5.0	13,722	1,248	9.1	47
1979.....	13,954	888	6.4	16,215	1,898	11.7	47
1989.....	15,981	972	6.1	18,316	2,223	12.1	44
1995.....	16,299	1,292	7.9	18,530	2,603	14.0	50
2000.....	15,617	1,320	8.5	17,889	2,559	14.3	52
Northern America/Oceania							
Australia <sup>5</sup>							
1971.....	5,424	380	7.0	5,489	558	10.2	68
1976.....	5,769	436	7.6	5,882	637	10.8	69
1986.....	6,568	606	9.2	6,749	867	12.9	70
Canada							
1971.....	8,105	558	6.9	8,306	762	9.2	73
1981.....	9,014	746	8.3	9,422	1,097	11.6	68
1991.....	10,175	1,002	9.9	10,732	1,500	14.0	67
2001.....	11,595	1,293	11.2	12,313	1,848	15.0	70
New Zealand							
1981.....	1,299	115	8.9	1,352	165	12.2	70
1991.....	1,395	140	10.1	1,471	201	13.6	70
1996.....	1,503	159	10.6	1,588	220	13.9	72
2001.....	1,547	170	11.0	1,656	230	13.9	74
United States							
1970.....	71,959	5,859	8.1	77,366	8,772	11.3	67
1980.....	80,287	7,328	9.1	86,767	11,673	13.5	63
1990.....	90,386	9,180	10.2	96,667	14,389	14.9	64
2000.....	108,376	3,426	10.1	113,985	4,687	14.4	67
Africa							
Egypt							
1976.....	8,540	265	3.1	8,018	247	3.1	107
1986.....	10,909	444	4.1	10,307	359	3.5	124
1996.....	12,958	483	3.7	12,329	388	3.2	124
Kenya							
1979.....	1,307	21	1.6	1,075	18	1.7	117
1989.....	1,933	23	1.2	1,606	22	1.4	106
2003 <sup>6</sup> .....	3,307	43	1.3	3,226	29	0.9	148
Malawi							
1977.....	254	4	1.5	217	3	1.5	120
1987.....	446	7	1.6	408	6	1.6	109
1998.....	743	10	1.3	693	10	1.4	101
Morocco							
1971.....	2,628	95	3.6	2,740	103	3.8	92
1982.....	4,379	138	3.2	4,355	141	3.2	98
2004.....	8,022	394	4.9	8,317	446	5.4	88

See footnotes at end of table.

Table B-5

**Total and Older Urban<sup>1</sup> Population by Sex and Country: Selected Years 1969 to 2005—Con.**

(Numbers in thousands)

Country and year	Male			Female			65 and over sex ratio <sup>2</sup>
	All ages	65 and over	65+ as a percent of total population	All ages	65 and over	65+ as a percent of total population	
<b>Africa—Con.</b>							
<b>South Africa</b>							
1970.....	5,498	163	3.0	4,912	221	4.5	74
1985.....	6,556	266	4.1	6,512	376	5.8	71
1991.....	8,914	356	4.0	8,637	452	5.2	79
1996.....	10,668	391	3.7	11,114	590	5.3	66
<b>Tunisia</b>							
1975.....	1,402	51	3.6	1,378	47	3.4	108
1984.....	1,869	84	4.5	1,816	75	4.2	111
1994.....	2,717	138	5.1	2,645	139	5.2	99
<b>Uganda</b>							
1969.....	398	6	1.5	335	5	1.4	130
1991.....	917	12	1.3	973	15	1.5	77
2002.....	1,450	20	1.4	1,550	27	1.7	74
<b>Zimbabwe</b>							
1982.....	941	29	3.0	825	16	2.0	175
1992.....	1,636	33	2.0	1,551	29	1.8	114
1997.....	1,906	38	2.0	1,920	25	1.3	154
<b>Asia</b>							
<b>Bangladesh</b>							
1974.....	3,539	85	2.4	2,735	63	2.3	134
1981.....	7,370	226	3.1	5,858	157	2.7	144
1991.....	11,301	306	2.7	9,571	223	2.3	137
2004 <sup>6</sup> .....	15,972	607	3.8	15,856	444	3.2	137
<b>China</b>							
1982.....	107,915	4,183	3.9	98,332	5,187	5.3	81
1990.....	157,492	7,082	4.5	142,666	8,260	5.8	86
2000.....	235,265	14,088	6.0	223,506	15,378	6.9	92
<b>India</b>							
1971.....	58,718	1,526	2.6	50,378	1,495	3.0	102
1981.....	83,876	2,486	3.0	73,804	2,546	3.4	98
1991.....	113,937	3,767	3.3	101,835	3,704	3.6	102
2001.....	150,554	5,969	4.0	135,566	6,344	4.7	94
<b>Indonesia</b>							
1971.....	10,194	197	1.9	10,256	245	2.4	80
1980.....	16,440	375	2.3	16,402	490	3.0	77
1990.....	27,683	801	2.9	27,750	981	3.5	82
2000.....	42,760	1,522	3.6	42,621	1,791	4.2	85
<b>Israel</b>							
1972.....	1,343	101	7.5	1,341	104	7.8	97
1983.....	1,793	156	8.7	1,823	178	9.7	88
1995.....	2,452	211	8.6	2,519	281	11.2	75
2004.....	3,064	270	8.8	3,163	367	11.6	74
<b>Japan</b>							
1970.....	36,890	2,045	5.5	37,799	2,613	6.9	78
1975.....	41,989	2,580	6.1	42,933	3,387	7.9	76
1980.....	43,979	3,095	7.0	45,138	4,219	9.3	73
1985.....	45,766	3,560	7.8	47,083	5,138	10.9	69
1990.....	47,124	4,225	9.0	48,519	6,280	12.9	67
1995.....	48,210	5,386	11.2	49,799	7,694	15.4	70
2000.....	49,006	6,786	13.9	50,860	9,321	18.3	73

See footnotes at end of table.

Table B-5

**Total and Older Urban<sup>1</sup> Population by Sex and Country: Selected Years 1969 to 2005—Con.**

(Numbers in thousands)

Country and year	Male			Female			65 and over sex ratio <sup>2</sup>
	All ages	65 and over	65+ as a percent of total population	All ages	65 and over	65+ as a percent of total population	
Asia—Con.							
Malaysia							
1970.....	1,402	41	2.9	1,378	46	3.3	88
1980.....	2,045	69	3.4	2,028	80	3.9	87
1991.....	4,473	133	3.0	4,426	167	3.8	80
2000.....	7,318	218	3.0	7,108	261	3.7	83
Pakistan							
1972.....	9,019	290	3.2	7,561	213	2.8	136
1981.....	12,767	447	3.5	11,074	327	3.0	136
1998.....	22,374	641	2.9	20,001	537	2.7	119
2003.....	25,819	877	3.4	23,821	726	3.1	121
Philippines							
1970.....	5,671	149	2.6	5,999	170	2.8	88
1980.....	8,765	244	2.8	9,178	342	3.7	71
1990.....	14,546	415	2.9	14,894	538	3.6	77
2003 <sup>6</sup> .....	21,432	686	3.2	22,443	965	4.3	71
Singapore <sup>7</sup>							
1970.....	1,062	31	2.9	1,012	39	3.8	79
1980.....	1,232	51	4.2	1,182	63	5.3	82
1990.....	1,518	75	5.0	1,499	93	6.2	81
South Korea							
1975.....	8,370	129	1.5	8,400	254	3.0	51
1985.....	13,154	271	2.1	13,264	522	3.9	52
1995.....	17,596	536	3.0	17,396	978	5.6	55
2000.....	18,418	757	4.1	18,225	1,244	6.8	61
Sri Lanka							
1971.....	1,513	58	3.9	1,335	56	4.2	104
1981.....	1,666	69	4.1	1,529	72	4.7	95
Thailand							
1970.....	2,257	56	2.5	2,296	79	3.5	70
1980.....	3,744	109	2.9	3,888	148	3.8	74
1990.....	4,941	173	3.5	5,266	231	4.4	75
2000.....	9,086	476	5.2	9,748	626	6.4	76
2004.....	9,261	528	5.7	10,039	711	7.1	74
Turkey							
1980.....	10,272	345	3.4	9,373	457	4.9	75
1985.....	14,011	399	2.8	12,855	533	4.1	75
1990.....	17,248	519	3.0	16,079	675	4.2	77
2000.....	22,428	919	4.1	21,579	1,179	5.5	78
Latin America/Caribbean							
Argentina							
1980.....	11,214	821	7.3	11,979	1,159	9.7	71
1995.....	14,821	1,186	8.0	15,736	1,761	11.2	67
2001.....	17,659	1,293	8.3	18,601	1,977	11.8	65
Brazil							
1970.....	25,173	803	3.2	26,802	1,010	3.8	80
1980.....	39,192	1,448	3.7	41,173	1,865	4.5	78
1991.....	53,854	2,333	4.3	57,137	3,083	5.4	76
2000.....	66,883	3,426	5.1	71,071	4,687	6.6	73

See footnotes at end of table.

Table B-5  
**Total and Older Urban<sup>1</sup> Population by Sex and Country: Selected Years 1969 to 2005—Con.**  
(Numbers in thousands)

Country and year	Male			Female			65 and over sex ratio <sup>2</sup>
	All ages	65 and over	65+ as a percent of total population	All ages	65 and over	65+ as a percent of total population	
<b>Latin America/Caribbean—Con.</b>							
<b>Chile</b>							
1970.....	3,173	140	4.4	3,502	194	5.5	72
1982.....	4,464	219	4.9	4,852	313	6.5	70
1992.....	5,365	288	5.4	5,776	427	7.4	68
2005.....	6,910	440	6.4	7,213	647	9.0	68
<b>Colombia</b>							
1973.....	5,905	172	2.9	6,703	233	3.5	74
1985.....	8,928	322	3.6	9,786	407	4.2	79
1993.....	11,212	473	4.2	12,302	593	4.8	80
2000 <sup>6</sup> .....	13,508	729	5.4	14,354	947	6.6	77
2005 <sup>6</sup> .....	15,114	982	6.5	15,878	1,223	7.7	80
<b>Costa Rica</b>							
1973.....	361	14	3.9	399	18	4.6	76
1984.....	514	24	4.7	561	32	5.8	75
2000.....	1,096	60	5.4	1,153	77	6.7	77
<b>Guatemala</b>							
1973.....	906	29	3.2	973	37	3.8	80
1981.....	950	35	3.7	1,031	43	4.1	83
1989.....	1,657	56	3.4	1,734	72	4.1	78
<b>Jamaica</b>							
1982.....	494	23	4.7	552	33	6.0	70
1991.....	543	28	5.1	605	40	6.6	70
2004.....	655	38	5.9	718	52	7.2	74
<b>Mexico</b>							
1970.....	13,883	463	3.3	14,426	581	4.0	80
1995.....	32,720	1,277	3.9	34,283	1,571	4.6	81
2003.....	40,689	1,789	4.4	41,113	2,176	5.3	82
<b>Peru</b>							
1972.....	4,028	125	3.1	4,030	154	3.8	81
1981.....	5,518	193	3.5	5,574	225	4.0	86
1993.....	7,606	325	4.3	7,852	372	4.7	87
2004.....	10,000	485	4.9	9,966	567	5.7	86
<b>Uruguay</b>							
1975.....	1,100	100	9.1	1,215	138	11.4	72
1985.....	1,222	120	9.8	1,359	178	13.1	67
1996.....	1,366	148	10.8	1,506	226	15.0	66
2004.....	1,471	159	10.8	1,612	250	15.5	64

<sup>1</sup> Urban refers to localities defined as such by each country, and definitions often differ among countries. National definitions are usually based on criteria that may include any of the following: size of population in a locality, population density, distance between built-up areas, predominant type of economic activity, legal or administrative boundaries, and the presence of specific services and facilities. The definition of "urban" within a given country may change over time, and geographic areas that were once considered rural may be classified as urban at a later date.

<sup>2</sup> 65 and over sex ratio is defined as the number of men aged 65 and over per 100 women aged 65 and over.

<sup>3</sup> Urban/rural estimates after 1981 are available from population registers for individual areas and municipalities, but published data are not aggregated to produce national figures.

<sup>4</sup> The last national Population and Housing Census was conducted in 1990. More recent estimates, based on information from population registers, are readily available for subnational regions only.

<sup>5</sup> National-level estimates for Australia are not readily available after 1986. Government estimates for 2004 suggest that the percentage of population at ages 45 and above is higher in rural areas than in urban areas.

<sup>6</sup> Data for the following countries/years were derived using (1) population percentage distributions by age, sex, and urban/rural residence reported in national demographic and health survey volumes and (2) corresponding midyear population age/sex distributions estimated by the U.S. Census Bureau: Colombia 2000 and 2005; Philippines 2003; Kenya 2003; and Bangladesh 2004.

<sup>7</sup> In 2000, Singapore began conducting register-based population censuses. Population age/sex structure is readily available only for the resident population, which constituted about 80 percent of the total enumerated population in 2000. The percent aged 65 and over among men and women in 2000 was 6.6 and 8.0, respectively.

Sources: United Nations Department of Economic and Social Affairs, various issues of the *Demographic Yearbook*; U.S. Census Bureau, Population Division data files; and country sources.

Table B-6.  
**Marital Status of the Older Population by Sex, Country, and Age: Selected Years 1969 to 2007**

(Numbers in thousands)

Country, year, and age	Male						Female					
	Total	Single	Married <sup>1</sup>	Sep- arated/ divorced	Widowed	Percent widowed	Total	Single	Married <sup>1</sup>	Sep- arated/ divorced	Widowed	Percent widowed
<b>Western Europe</b>												
<b>Austria</b>												
1975												
55 to 64.....	293	18	252	11	12	4.1	418	45	234	24	115	27.6
65 and over.....	419	28	303	12	76	18.2	712	90	198	26	398	55.9
75 and over.....	128	8	75	3	42	32.9	271	36	38	7	190	70.1
1982												
55 to 64.....	325	19	282	12	12	3.7	464	48	287	29	100	21.5
65 and over.....	398	25	289	12	72	18.2	717	83	189	31	414	57.7
75 and over.....	152	10	92	4	46	30.1	319	40	46	10	224	70.2
1991												
55 to 64.....	368	24	310	20	15	4.0	407	33	269	28	76	18.8
65 and over.....	404	22	303	13	66	16.3	763	79	230	39	415	54.4
80 and over.....	81	5	46	2	29	35.4	202	23	20	7	152	75.4
2001												
55 to 64.....	438	29	340	57	12	2.7	465	30	308	68	60	12.8
65 and over.....	472	22	352	35	63	13.3	770	66	263	61	380	49.3
75 and over.....	179	7	120	12	40	22.2	403	38	79	28	258	63.9
<b>Belgium</b>												
1970												
55 to 64.....	510	42	432	9	27	5.3	568	48	397	11	112	19.8
65 and over.....	532	37	367	6	121	22.8	764	76	289	10	389	50.9
75 and over.....	165	11	88	1	66	39.8	279	32	58	3	186	66.8
1981												
55 to 64.....	486	35	417	13	21	4.4	531	39	382	15	95	17.9
65 and over.....	560	40	394	10	115	20.6	855	77	311	17	450	52.6
75 and over.....	196	13	111	3	69	35.4	371	36	76	6	253	68.2
1995												
55 to 64.....	539	38	447	33	21	3.9	573	29	427	35	82	14.3
65 and over.....	639	41	473	20	105	16.4	957	70	378	32	477	49.9
75 and over.....	206	13	127	4	62	30.1	416	35	84	10	287	68.9
<b>Denmark<sup>2</sup></b>												
1970												
55 to 64.....	266	24	216	15	12	4.5	285	28	189	20	48	16.7
65 and over.....	268	22	182	9	55	20.7	342	48	125	15	155	45.2
75 and over.....	92	7	50	2	33	36.3	128	19	26	4	78	61.3
1984												
55 to 64.....	259	21	206	20	12	4.5	279	17	192	25	45	16.1
65 and over.....	318	25	220	16	57	17.9	444	45	160	28	210	47.3
75 and over.....	116	9	69	4	35	29.8	199	25	41	10	122	61.6
1991												
55 to 64.....	242	20	186	26	11	4.3	257	13	176	29	39	15.2
65 and over.....	331	25	226	20	59	17.9	471	38	170	35	229	48.6
80 and over.....	63	5	33	2	23	36.9	129	15	18	7	90	69.7
2000												
55 to 64.....	303	25	226	42	10	3.3	306	14	211	48	32	10.6
65 and over.....	330	22	223	26	58	17.7	461	27	169	42	224	48.6
75 and over.....	138	9	83	8	39	27.9	239	16	53	17	153	64.0
2007												
55 to 64.....	353	39	253	50	10	2.9	355	23	243	61	28	7.8
65 and over.....	359	22	245	35	56	15.6	468	21	189	53	204	43.7
75 and over.....	144	8	88	10	38	26.7	233	12	55	19	146	62.7

See footnotes at end of table.

Table B-6.  
**Marital Status of the Older Population by Sex, Country, and Age: Selected Years 1969 to 2007—Con.**

(Numbers in thousands)

Country, year, and age	Male						Female					
	Total	Single	Married <sup>1</sup>	Sep- arated/ divorced	Widowed	Percent widowed	Total	Single	Married <sup>1</sup>	Sep- arated/ divorced	Widowed	Percent widowed
<b>Western Europe—Con.</b>												
<b>France</b>												
1977												
55 to 64.....	2,134	186	1,796	60	92	4.3	2,390	194	1,624	95	477	20.0
65 and over.....	2,814	216	2,041	57	500	17.8	4,409	435	1,523	121	2,331	52.9
75 and over.....	917	60	566	13	279	30.4	1,898	204	346	39	1,309	69.0
1987												
55 to 64.....	2,829	265	2,347	112	104	3.7	3,117	236	2,182	156	543	17.4
65 and over.....	2,866	214	2,100	76	476	16.6	4,536	388	1,582	159	2,406	53.1
75 and over.....	1,217	88	776	26	327	26.9	2,376	220	496	69	1,592	67.0
1999												
55 to 64.....	2,687	234	2,155	226	72	2.7	2,800	189	1,992	277	342	12.2
65 and over.....	3,971	321	3,016	151	482	12.1	5,779	437	2,424	267	2,651	45.9
75 and over.....	1,614	117	1,133	40	323	20.0	2,888	230	759	105	1,794	62.1
<b>Germany</b>												
1970												
55 to 64.....	3,137	136	2,795	82	124	3.9	4,304	392	2,502	171	1,240	28.8
65 and over.....	3,087	132	2,317	51	586	19.0	4,904	574	1,547	127	2,656	54.2
75 and over.....	879	36	518	9	316	35.9	1,680	201	275	32	1,172	69.8
1982												
55 to 64.....	2,737	111	2,446	79	102	3.7	3,807	339	2,495	185	788	20.7
65 and over.....	3,216	130	2,426	65	596	18.5	5,957	569	1,703	207	3,478	58.4
75 and over.....	1,251	56	793	19	384	30.7	2,631	288	423	67	1,854	70.4
1988												
55 to 64.....	3,265	171	2,822	145	127	3.9	3,638	278	2,515	194	651	17.9
65 and over.....	3,246	123	2,474	81	567	17.5	6,269	575	1,875	238	3,581	57.1
75 and over.....	1,404	58	921	28	397	28.3	3,158	301	516	94	2,247	71.2
2001												
55 to 64.....	5,433	373	4,491	378	191	3.5	5,570	236	4,129	504	701	12.6
65 and over.....	5,610	207	4,433	178	783	14.0	8,356	523	3,430	412	3,989	47.7
75 and over.....	1,842	47	1,313	35	439	23.8	3,884	281	908	165	2,528	65.1
<b>Greece</b>												
1971												
55 to 64.....	444	21	405	5	14	3.1	476	28	331	8	110	23.1
65 and over.....	418	21	334	3	61	14.6	538	27	210	5	296	55.1
1981												
55 to 64.....	424	19	392	4	9	2.1	475	30	340	9	96	20.3
65 and over.....	550	21	456	4	69	12.6	689	33	300	7	349	50.7
75 and over.....	190	7	140	1	42	22.0	264	11	75	2	177	66.9
1991												
55 to 64.....	631	24	584	8	15	2.4	669	37	506	15	111	16.6
65 and over.....	618	21	507	5	85	13.8	786	40	334	9	403	51.3
80 and over.....	128	4	83	1	40	31.5	182	7	38	1	136	74.5
2001												
55 to 64.....	569	27	508	20	15	2.6	631	30	457	32	112	17.8
65 and over.....	818	30	683	15	91	11.1	1,010	55	469	36	451	44.6
75 and over.....	279	10	211	4	55	19.7	380	21	109	13	237	62.3
<b>Italy</b>												
1971												
55 to 64.....	2,801	299	2,349	31	122	4.4	3,113	462	1,964	28	659	21.2
65 and over.....	2,551	274	1,768	19	490	19.2	4,292	560	1,199	16	2,516	58.6
75 and over.....	793	77	441	4	271	34.2	1,600	197	232	4	1,167	73.0

See footnotes at end of table.



Table B-6.  
**Marital Status of the Older Population by Sex, Country, and Age: Selected Years 1969 to 2007—Con.**

(Numbers in thousands)

Country, year, and age	Male						Female					
	Total	Single	Married <sup>1</sup>	Sep- arated/ divorced	Widowed	Percent widowed	Total	Single	Married <sup>1</sup>	Sep- arated/ divorced	Widowed	Percent widowed
<b>Western Europe—Con.</b>												
<b>Italy—Con.</b>												
1981												
55 to 64.....	2,701	203	2,373	36	89	3.3	3,102	347	2,106	45	604	19.5
65 and over.....	3,069	202	2,332	26	508	16.6	4,416	559	1,574	27	2,255	51.1
75 and over.....	968	59	610	6	294	30.3	1,716	226	329	5	1,155	67.3
1991												
55 to 64.....	3,182	281	2,743	56	102	3.2	3,508	319	2,515	63	611	17.4
65 and over.....	3,544	266	2,724	32	521	14.7	5,187	599	1,937	42	2,609	50.3
75 and over.....	1,391	99	935	8	349	25.1	2,412	297	521	11	1,583	65.6
2001												
55 to 64.....	3,278	264	2,798	126	90	2.7	3,512	255	2,634	139	485	13.8
65 and over.....	4,385	309	3,441	71	564	12.9	6,261	616	2,490	81	3,073	49.1
75 and over.....	1,729	113	1,227	16	373	21.6	3,033	333	699	22	1,979	65.3
<b>Norway</b>												
1977												
55 to 64.....	226	26	183	9	8	3.5	240	23	171	11	36	15.0
65 and over.....	246	29	170	6	41	16.8	331	56	123	10	141	42.7
75 and over.....	88	11	49	1	26	30.0	137	27	29	4	78	56.5
1987												
55 to 64.....	205	22	162	14	7	3.4	215	14	154	14	33	15.3
65 and over.....	279	30	197	9	43	15.5	389	48	150	15	176	45.2
75 and over.....	104	12	62	2	28	26.6	175	28	38	5	104	59.5
2001												
55 to 64.....	230	17	181	27	5	2.1	230	11	167	32	20	8.9
65 and over.....	282	23	200	17	41	14.7	395	26	156	24	189	47.7
75 and over.....	131	11	84	5	31	23.4	222	18	56	10	138	62.4
<b>Sweden</b>												
1977												
55 to 64.....	485	60	374	34	17	3.5	504	41	353	40	69	13.8
65 and over.....	569	73	379	24	94	16.4	731	111	278	35	307	42.0
75 and over.....	196	25	108	5	58	29.4	299	56	61	11	171	57.1
1987												
55 to 64.....	431	52	314	51	13	3.0	453	30	313	56	54	12.0
65 and over.....	657	76	443	41	97	14.8	874	92	345	61	375	43.0
75 and over.....	263	31	156	11	65	24.8	418	57	98	22	242	57.8
2001												
55 to 64.....	581	88	373	108	12	2.0	574	55	358	124	37	6.4
65 and over.....	662	62	431	79	90	13.6	880	56	351	110	363	41.3
75 and over.....	309	27	188	25	68	22.1	486	32	132	45	278	57.1
<b>United Kingdom</b>												
1971												
55 to 64.....	3,066	261	2,625	36	144	4.7	3,430	382	2,363	58	627	18.3
65 and over.....	2,798	206	2,017	17	558	20.0	4,478	671	1,561	32	2,215	49.5
75 and over.....	837	54	478	3	303	36.2	1,759	287	329	5	1,138	64.7
1986												
55 to 64.....	2,888	255	2,378	132	123	4.3	3,081	215	2,206	163	497	16.1
65 and over.....	3,353	253	2,425	80	596	17.8	5,141	544	1,902	135	2,561	49.8
75 and over.....	1,201	90	736	20	355	29.6	2,402	305	514	39	1,544	64.3
1991												
55 to 64.....	2,831	239	2,302	179	111	3.9	2,972	181	2,142	209	440	14.8
65 and over.....	3,615	270	2,588	107	650	18.0	5,395	501	2,068	163	2,664	49.4
80 and over.....	624	43	336	9	237	37.9	1,464	181	225	21	1,037	70.8

See footnotes at end of table.

Table B-6.  
**Marital Status of the Older Population by Sex, Country, and Age: Selected Years 1969 to 2007—Con.**

(Numbers in thousands)

Country, year, and age	Male						Female					
	Total	Single	Married <sup>1</sup>	Sep- arated/ divorced	Widowed	Percent widowed	Total	Single	Married <sup>1</sup>	Sep- arated/ divorced	Widowed	Percent widowed
<b>Western Europe—Con.</b>												
<b>United Kingdom—Con.</b>												
2001												
55 to 64.....	3,061	253	2,320	391	98	3.2	3,158	157	2,204	460	337	10.7
65 and over.....	3,911	290	2,709	240	672	17.2	5,430	381	2,139	317	2,592	47.7
80 and over.....	1,610	113	984	59	454	28.2	2,794	224	686	98	1,786	63.9
<b>Eastern Europe</b>												
<b>Bulgaria</b>												
1975												
55 to 64.....	400	5	371	5	18	4.5	421	8	326	8	80	18.9
65 and over.....	443	5	338	4	96	21.7	524	7	255	5	257	49.0
75 and over.....	124	1	72	1	50	40.1	168	2	48	1	118	70.0
1985												
55 to 64.....	547	12	496	13	25	4.7	586	12	440	20	113	19.2
65 and over.....	458	8	338	6	106	23.2	565	10	245	10	301	53.2
75 and over.....	167	3	97	2	66	39.2	228	4	61	3	160	70.2
2001												
55 to 64.....	432	16	376	21	19	4.5	490	10	345	29	106	21.6
65 and over.....	561	9	429	12	111	19.8	761	15	312	25	409	53.7
75 and over.....	190	2	120	3	65	34.2	292	6	70	7	208	71.5
<b>Czech Republic<sup>3</sup></b>												
1980												
55 to 64.....	647	31	560	30	26	4.0	758	35	501	45	176	23.2
65 and over.....	749	31	552	21	144	19.3	1,143	71	363	39	670	58.6
75 and over.....	216	8	128	4	75	34.9	424	31	65	11	317	74.9
1989												
55 to 64.....	720	35	615	41	30	4.1	847	30	554	63	200	23.6
65 and over.....	704	29	534	23	119	16.8	1,131	55	359	52	664	58.8
75 and over.....	266	11	175	6	74	28.0	512	28	92	16	376	73.4
2001												
55 to 64.....	525	25	426	55	19	3.5	583	16	393	70	105	18.0
65 and over.....	541	18	404	29	90	16.7	862	26	281	63	492	57.0
75 and over.....	187	6	121	7	53	28.4	379	13	62	23	281	74.1
<b>Hungary</b>												
1976												
55 to 64.....	471	17	418	17	19	4.0	565	31	361	33	139	24.7
65 and over.....	557	20	415	13	109	19.5	800	51	257	28	464	58.0
75 and over.....	163	5	94	3	61	37.4	281	18	39	6	218	77.5
1986												
55 to 64.....	568	23	488	30	28	4.9	685	30	434	55	166	24.3
65 and over.....	515	18	375	15	107	20.8	820	48	232	37	503	61.4
75 and over.....	193	7	114	4	68	35.2	357	23	50	10	274	76.7
1990												
55 to 64.....	540	21	454	36	29	5.5	654	24	409	57	164	25.0
65 and over.....	527	17	391	18	102	19.4	846	44	253	40	509	60.2
75 and over.....	200	7	126	5	63	31.5	377	22	58	12	284	75.5
2001												
55 to 64.....	509	27	402	53	27	5.3	635	23	380	75	157	24.8
65 and over.....	575	21	422	28	104	18.1	971	39	293	65	574	59.1
75 and over.....	204	7	131	7	59	28.9	415	20	67	21	307	74.0

See footnotes at end of table.

Table B-6.  
**Marital Status of the Older Population by Sex, Country, and Age: Selected Years 1969 to 2007—Con.**

(Numbers in thousands)

Country, year, and age	Male						Female					
	Total	Single	Married <sup>1</sup>	Sep- arated/ divorced	Widowed	Percent widowed	Total	Single	Married <sup>1</sup>	Sep- arated/ divorced	Widowed	Percent widowed
<b>Eastern Europe—Con.</b>												
<b>Poland</b>												
1978												
55 to 64.....	1,211	38	1,102	26	45	3.7	1,522	114	993	47	369	24.2
65 and over.....	1,389	43	1,105	19	222	16.0	2,172	182	703	29	1,259	58.0
75 and over.....	386	11	257	4	114	29.5	766	68	123	5	570	74.4
1984												
55 to 64.....	1,641	54	1,473	40	73	4.5	2,024	124	1,346	71	484	23.9
65 and over.....	1,341	39	1,044	18	241	18.0	2,207	167	666	30	1,344	60.9
70 and over.....	938	26	695	11	206	21.9	1,645	128	398	18	1,101	66.9
1990												
55 to 64.....	1,742	71	1,534	54	83	4.8	2,075	119	1,378	86	492	23.7
65 and over.....	1,404	46	1,081	23	253	18.0	2,323	185	722	38	1,378	59.3
75 and over.....	529	19	349	6	155	29.4	1,043	90	171	10	772	74.1
2002												
55 to 64.....	1,554	84	1,321	83	67	4.3	1,823	85	1,210	125	404	22.2
65 and over.....	1,830	59	1,418	56	297	16.2	2,998	152	1,023	102	1,722	57.4
75 and over.....	588	15	395	13	166	28.3	1,247	74	220	25	927	74.4
<b>Russia</b>												
1979												
55 to 64.....	3,599	32	3,323	104	139	3.9	7,055	412	3,546	578	2,519	35.7
65 and over.....	3,700	26	3,099	58	518	14.0	9,969	364	2,142	323	7,140	71.6
70 and over.....	1,998	14	1,565	26	393	19.6	6,183	204	949	147	4,884	79.0
1989												
55 to 64.....	6,943	102	6,116	360	364	5.2	9,771	489	5,699	952	2,632	26.9
65 and over.....	3,692	35	2,930	78	649	17.6	10,398	566	2,440	471	6,922	66.6
70 and over.....	2,330	20	1,750	38	521	22.4	7,269	343	1,186	247	5,492	75.6
2002												
55 to 64.....	5,570	150	4,566	463	391	7.0	7,650	271	4,245	993	2,142	28.0
65 and over.....	5,993	78	4,529	216	1,170	19.5	12,692	593	3,765	831	7,503	59.1
70 and over.....	3,564	37	2,552	92	882	24.7	8,818	462	2,033	477	5,846	66.3
<b>Ukraine</b>												
1979												
55 to 64.....	1,536	13	1,434	34	56	3.6	2,831	158	1,492	202	979	34.6
65 and over.....	1,818	13	1,498	22	285	15.7	4,015	123	1,013	109	2,769	69.0
70 and over.....	1,057	7	812	10	228	21.5	2,488	68	477	49	1,894	76.1
1989												
55 to 64.....	2,588	30	2,328	101	129	5.0	3,591	202	2,149	315	925	25.8
65 and over.....	1,761	15	1,388	30	327	18.6	4,273	203	1,111	168	2,791	65.3
70 and over.....	1,098	9	809	15	267	24.3	2,892	114	514	83	2,180	75.4
2001												
55 to 64.....	2,285	45	1,932	156	152	6.6	3,128	97	1,807	340	884	28.3
65 and over.....	2,322	23	1,767	66	466	20.1	4,625	243	1,385	233	2,764	59.8
70 and over.....	1,455	12	1,047	31	366	25.1	3,338	189	789	141	2,219	66.5
<b>Northern America/ Oceania</b>												
<b>Australia</b>												
1971												
55 to 64.....	545	45	447	28	25	4.6	562	40	379	29	113	20.2
65 and over.....	447	40	304	19	84	18.8	618	66	205	19	328	53.0
75 and over.....	140	12	77	5	46	33.1	246	29	43	5	169	68.5

See footnotes at end of table.

Table B-6.

**Marital Status of the Older Population by Sex, Country, and Age: Selected Years 1969 to 2007—Con.**

(Numbers in thousands)

Country, year, and age	Male						Female					
	Total	Single	Married <sup>1</sup>	Sep- arated/ divorced	Widowed	Percent widowed	Total	Single	Married <sup>1</sup>	Sep- arated/ divorced	Widowed	Percent widowed
<b>Northern America/ Oceania—Con.</b>												
<b>Australia—Con.</b>												
1981												
55 to 64.....	651	50	530	45	26	4.0	675	33	473	48	121	17.9
65 and over.....	601	45	433	29	94	15.7	828	68	307	30	424	51.1
1986												
55 to 64.....	715	56	574	59	26	3.6	721	31	511	62	116	16.1
65 and over.....	693	49	507	37	100	14.5	953	65	384	41	463	48.5
75 and over.....	230	16	147	9	57	25.0	396	34	93	10	258	65.2
1996												
55 to 64.....	745	50	581	93	21	2.8	739	29	523	98	89	12.1
65 and over.....	932	59	673	69	131	14.1	1,219	60	513	75	570	46.8
75 and over.....	338	20	219	17	82	24.3	555	33	143	21	359	64.7
2001												
55 to 64.....	885	59	671	134	22	2.4	875	36	609	146	84	9.6
65 and over.....	1,043	63	748	90	142	13.6	1,328	58	575	100	596	44.9
75 and over.....	427	25	280	26	97	22.6	663	33	189	31	410	61.9
<b>Canada</b>												
1976												
55 to 64.....	928	76	778	42	32	3.5	996	79	690	50	177	17.8
65 and over.....	875	84	627	31	133	15.2	1,127	115	422	29	561	49.8
75 and over.....	296	29	177	8	81	27.5	452	48	95	6	304	67.2
1986												
55 to 64.....	1,124	83	926	79	37	3.3	1,204	72	849	94	188	15.6
65 and over.....	1,133	86	844	50	153	13.5	1,506	76	618	57	754	50.1
75 and over.....	394	32	256	14	93	23.6	653	65	146	13	428	65.6
1996												
55 to 64.....	1,224	77	1,000	116	31	2.5	1,265	68	894	151	152	12.0
65 and over.....	1,488	95	1,115	89	189	12.7	2,038	139	846	116	938	46.0
75 and over.....	544	34	368	24	118	21.7	919	74	231	31	584	63.5
2001												
55 to 64.....	1,411	91	1,139	150	30	2.2	1,457	83	1,026	205	143	9.8
65 and over.....	1,663	98	1,247	111	205	12.4	2,226	138	945	153	990	44.5
75 and over.....	657	38	450	32	137	20.8	1,089	76	298	46	669	61.5
<b>New Zealand</b>												
1976												
55 to 64.....	127	9	108	5	5	4.1	137	9	97	6	25	18.0
65 and over.....	119	8	88	4	19	16.1	160	16	62	4	78	48.5
75 and over.....	35	2	22	1	10	29.5	62	7	13	1	41	66.0
1986												
55 to 64.....	142	10	115	12	6	4.1	143	7	101	11	23	16.3
65 and over.....	141	9	103	6	22	15.9	196	15	78	7	96	49.2
75 and over.....	48	3	30	2	13	27.0	82	7	19	2	54	65.8
1996												
55 to 64.....	137	8	113	12	4	2.8	139	5	103	15	16	11.7
65 and over.....	167	10	125	9	23	13.7	218	12	95	11	100	46.0
75 and over.....	59	3	39	2	14	24.1	99	7	26	3	63	63.9
2001												
55 to 64.....	156	10	118	24	5	3.0	161	7	110	26	18	11.1
65 and over.....	184	10	132	15	27	14.7	237	11	99	16	111	46.8
75 and over.....	73	4	48	4	17	24.1	117	6	31	5	75	64.0

See footnotes at end of table.

Table B-6.  
**Marital Status of the Older Population by Sex, Country, and Age: Selected Years 1969 to 2007—Con.**

(Numbers in thousands)

Country, year, and age	Male						Female					
	Total	Single	Married <sup>1</sup>	Sep- arated/ divorced	Widowed	Percent widowed	Total	Single	Married <sup>1</sup>	Sep- arated/ divorced	Widowed	Percent widowed
<b>Northern America/ Oceania—Con.</b>												
<b>United States</b>												
1980												
55 to 64.....	10,057	552	8,398	740	367	3.7	11,472	569	7,718	1,080	2,105	18.3
65 and over.....	10,012	564	7,441	511	1,495	14.9	15,021	1,014	5,339	790	7,878	52.4
75 and over.....	3,386	199	2,157	138	893	26.4	6,276	464	1,189	227	4,396	70.0
1990												
55 to 64.....	9,981	556	8,004	1,073	347	3.5	11,167	508	7,398	1,483	1,777	15.9
65 and over.....	12,565	619	9,399	766	1,782	14.2	18,677	1,026	7,218	1,207	9,226	49.4
75 and over.....	4,624	227	3,111	206	1,080	23.4	8,512	536	1,964	373	5,638	66.2
2000												
55 to 64.....	11,569	650	8,909	1,687	323	2.8	12,602	627	8,129	2,342	1,504	11.9
65 and over.....	14,382	633	10,610	1,140	1,999	13.9	20,597	889	8,626	1,748	9,333	45.3
75 and over.....	6,027	248	4,147	329	1,302	21.6	10,451	476	3,174	595	6,206	59.4
2006												
55 to 64.....	15,234	1,164	10,599	3,091	380	2.5	16,385	1,122	9,797	3,895	1,571	9.6
65 and over.....	15,607	713	10,599	2,087	2,207	14.1	21,584	985	8,145	2,869	9,586	44.4
75 and over.....	6,929	287	4,308	773	1,562	22.5	11,325	512	2,886	1,071	6,856	60.5
<b>Africa</b>												
<b>Egypt</b>												
1976												
55 to 64.....	958	37	875	5	41	4.3	899	41	444	9	405	45.1
65 and over.....	634	33	514	4	83	13.0	668	38	154	5	471	70.5
1986												
55 to 64.....	1,239	48	1,120	7	64	5.1	1,259	43	680	17	518	41.1
65 and over.....	948	83	725	5	136	14.3	849	71	201	8	569	67.0
1996												
55 to 64.....	1,479	11	1,392	6	70	4.7	710	14	75	17	604	85.1
65 and over.....	1,061	7	888	4	162	15.2	948	10	218	8	712	75.1
75 and over.....	240	2	178	1	60	24.9	224	3	23	1	197	87.9
<b>Malawi</b>												
1977												
55 to 64.....	113	2	105	4	3	2.4	121	1	76	14	30	24.9
65 and over.....	122	2	106	5	9	7.2	126	2	50	13	61	48.6
1987												
55 to 64.....	147	2	135	6	4	2.5	164	1	101	22	39	23.8
65 and over.....	158	2	136	8	12	7.8	169	2	65	22	80	47.2
<b>Morocco</b>												
1971												
55 to 64.....	333	11	305	6	11	3.2	299	10	132	17	140	46.6
65 and over.....	373	13	314	9	37	9.8	341	14	66	17	243	71.5
1982												
55 to 64.....	482	8	452	8	14	2.9	457	6	241	23	188	41.2
65 and over.....	425	8	367	9	40	9.5	375	8	85	15	267	71.1
75 and over.....	170	4	137	5	24	14.4	143	3	19	6	116	81.1
1994												
55 to 64.....	657	18	619	5	15	2.2	680	4	419	24	232	34.1
65 and over.....	593	16	521	8	49	8.2	576	4	174	30	367	63.8
75 and over.....	210	4	171	4	30	14.3	188	1	32	8	147	78.1

See footnotes at end of table.

Table B-6.  
**Marital Status of the Older Population by Sex, Country, and Age: Selected Years 1969 to 2007—Con.**

(Numbers in thousands)

Country, year, and age	Male						Female					
	Total	Single	Married <sup>1</sup>	Sep- arated/ divorced	Widowed	Percent widowed	Total	Single	Married <sup>1</sup>	Sep- arated/ divorced	Widowed	Percent widowed
<b>Africa—Con.</b>												
<b>South Africa</b>												
1985												
55 to 64.....	544	38	466	13	27	5.0	627	43	375	22	188	30.0
65 and over.....	464	31	361	8	64	13.9	647	42	235	12	357	55.2
75 and over.....	141	10	100	2	29	20.7	231	17	59	3	153	66.1
1991												
55 to 64.....	746	52	631	22	40	5.4	828	62	490	39	237	28.6
65 and over.....	551	28	427	12	83	15.1	780	45	284	19	431	55.3
75 and over.....	161	8	112	3	38	23.4	271	17	65	5	185	68.2
1996												
55 to 64.....	818	82	663	32	41	5.1	1,110	131	648	60	270	24.4
65 and over.....	724	59	554	19	93	12.8	1,135	101	491	31	512	45.1
75 and over.....	235	20	168	5	43	18.3	410	36	143	8	223	54.3
<b>Tunisia</b>												
1975												
55 to 64.....	158	4	147	1	6	3.7	129	3	81	3	42	32.3
65 and over.....	119	3	101	1	14	11.4	100	4	31	4	62	61.5
1984												
55 to 64.....	191	4	180	1	6	3.1	172	3	114	2	53	30.9
65 and over.....	167	6	142	1	18	10.9	132	5	44	1	81	61.8
75 and over.....	48	4	36	—	9	18.3	41	3	7	—	31	76.3
1994												
55 to 64.....	260	5	249	2	5	1.8	258	3	185	4	65	25.3
65 and over.....	247	6	217	2	23	9.3	228	3	87	3	134	58.9
75 and over.....	86	2	70	1	14	16.2	78	2	16	1	59	76.0
<b>Uganda</b>												
1969												
55 to 64.....	195	22	143	19	10	5.1	224	14	128	25	56	25.2
65 and over.....	204	22	139	20	22	11.0	159	15	42	15	86	54.5
1991												
55 to 64.....	272	18	206	32	16	5.8	278	8	134	35	101	36.3
65 and over.....	282	17	196	33	36	12.9	273	8	74	28	163	59.6
75 and over.....	114	6	75	13	20	17.3	102	3	18	9	72	70.1
<b>Zimbabwe</b>												
1982												
55 to 64.....	144	6	127	6	5	3.1	126	4	76	7	39	31.0
65 and over.....	116	7	95	5	9	8.0	123	6	44	5	67	54.6
75 and over.....	47	4	37	2	5	11.1	53	3	15	2	33	62.0
1992												
55 to 64.....	190	5	170	9	6	3.2	171	3	102	13	53	31.2
65 and over.....	161	5	134	8	15	9.0	181	4	58	9	111	61.1
75 and over.....	52	2	40	3	7	13.9	68	2	14	3	50	73.2
<b>Asia</b>												
<b>Bangladesh</b>												
1974												
55 to 64.....	1,695	14	1,595	2	84	4.9	1,339	4	578	5	752	56.2
65 and over.....	1,373	12	1,212	1	148	10.8	1,001	5	209	2	786	78.5
1981												
55 to 64.....	1,969	29	1,865	1	75	3.8	1,600	14	744	4	838	52.4
65 and over.....	1,705	4	1,518	1	181	10.6	1,250	1	345	2	902	72.2

See footnotes at end of table.

Table B-6.  
**Marital Status of the Older Population by Sex, Country, and Age: Selected Years 1969 to 2007—Con.**

(Numbers in thousands)

Country, year, and age	Male						Female					
	Total	Single	Married <sup>1</sup>	Sep- arated/ divorced	Widowed	Percent widowed	Total	Single	Married <sup>1</sup>	Sep- arated/ divorced	Widowed	Percent widowed
<b>Asia—Con.</b>												
<b>Bangladesh—Con.</b>												
1991												
55 to 64.....	2,315	12	2,255	2	47	2.0	1,904	11	1,083	5	804	42.2
65 and over.....	1,981	13	1,862	4	102	5.2	1,451	13	541	4	894	61.6
<b>China<sup>4</sup></b>												
1982												
50 to 59.....	38,995	1,159	33,740	781	3,316	8.5	35,626	75	29,271	167	6,113	17.2
60 to 79.....	33,773	858	23,850	530	8,535	25.3	37,708	109	16,659	146	20,794	55.1
80 and over.....	1,761	44	655	15	1,047	59.5	3,280	9	234	4	3,033	92.5
1990												
55 to 64.....	39,380	1,257	33,412	627	4,083	10.4	36,428	72	27,982	139	8,234	22.6
65 and over.....	28,718	646	19,114	335	8,623	30.0	34,477	105	12,794	115	21,463	62.3
2000												
55 to 64.....	4,485	186	3,928	53	318	7.1	4,169	6	3,467	18	678	16.3
65 and over.....	4,112	113	3,002	37	960	23.3	4,592	11	2,246	16	2,319	50.5
<b>India</b>												
1971												
55 to 64.....	14,352	347	11,826	66	2,112	14.7	12,841	58	5,966	64	6,753	52.6
65 and over.....	9,383	227	6,621	44	2,492	26.6	8,929	32	2,221	29	6,647	74.4
1981												
55 to 64.....	17,888	368	15,362	70	2,088	11.7	16,698	60	9,117	82	7,439	44.5
65 and over.....	12,625	254	9,375	48	2,948	23.3	12,377	50	3,580	42	8,706	70.3
1991												
55 to 64.....	22,843	516	20,180	67	2,079	9.1	21,372	143	13,726	96	7,407	34.7
65 and over.....	17,444	724	13,449	57	3,214	18.4	16,473	292	6,265	60	9,856	59.8
75 and over.....	5,418	452	3,634	22	1,309	24.2	5,091	209	1,407	17	3,457	67.9
2001												
55 to 64.....	27,169	454	24,484	89	2,142	7.9	28,001	250	18,929	161	8,661	30.9
65 and over.....	24,182	707	19,073	80	4,322	17.9	24,924	433	10,268	111	14,111	56.6
75 and over.....	7,182	320	5,013	25	1,824	25.4	7,408	202	2,258	29	4,919	66.4
<b>Indonesia</b>												
1971												
55 to 64.....	2,208	35	1,950	28	195	8.8	2,356	20	933	88	1,315	55.8
65 and over.....	1,440	20	1,128	23	269	18.7	1,529	13	355	45	1,115	73.0
75 and over.....	380	6	269	6	100	26.2	406	4	69	10	324	79.7
1980												
55 to 64.....	3,280	24	3,016	49	191	5.8	3,339	33	1,618	211	1,477	44.2
65 and over.....	2,189	20	1,788	41	340	15.5	2,581	27	658	133	1,764	68.3
75 and over.....	688	7	508	14	160	23.2	837	9	144	35	648	77.4
1990												
55 to 64.....	4,541	114	4,088	66	273	6.0	4,817	54	2,656	251	1,856	38.5
65 and over.....	3,143	119	2,518	56	449	14.3	3,608	71	1,021	154	2,362	65.5
75 and over.....	868	47	607	20	194	22.3	1,105	31	194	37	842	76.2
2000												
55 to 64.....	5,480	63	5,055	62	300	5.5	5,519	104	3,404	188	1,823	33.0
65 and over.....	4,292	147	3,500	56	589	13.7	4,827	209	1,661	137	2,820	58.4
75 and over.....	1,258	103	901	19	234	18.6	1,459	126	340	35	959	65.7
<b>Israel</b>												
1972												
55 to 64.....	127	4	117	2	5	3.9	134	3	94	4	33	24.5
65 and over.....	111	3	89	1	18	16.0	114	3	42	2	67	58.6

See footnotes at end of table.

Table B-6.  
**Marital Status of the Older Population by Sex, Country, and Age: Selected Years 1969 to 2007—Con.**

(Numbers in thousands)

Country, year, and age	Male						Female					
	Total	Single	Married <sup>1</sup>	Sep- arated/ divorced	Widowed	Percent widowed	Total	Single	Married <sup>1</sup>	Sep- arated/ divorced	Widowed	Percent widowed
<b>Asia—Con.</b>												
<b>Israel—Con.</b>												
1983												
55 to 64.....	141	4	129	3	4	3.1	163	4	120	6	34	21.0
65 and over.....	169	4	137	3	25	14.6	192	5	79	5	102	53.3
75 and over.....	60	1	43	1	15	24.3	67	2	16	2	48	71.2
1995												
55 to 64.....	176	5	158	9	5	2.8	202	7	143	16	35	17.4
65 and over.....	236	6	186	7	37	15.7	311	8	125	12	165	53.1
75 and over.....	94	3	65	2	24	26.1	126	4	29	3	91	71.9
<b>Japan</b>												
1970												
55 to 64.....	3,773	43	3,478	53	199	5.3	4,344	78	2,722	129	1,414	32.6
65 and over.....	3,227	32	2,443	40	712	22.1	4,108	49	1,282	73	2,704	65.8
75 and over.....	877	8	530	9	329	37.6	1,361	14	186	19	1,142	83.9
1985												
55 to 64.....	5,785	109	5,365	120	191	3.3	6,609	263	4,882	283	1,182	17.9
65 and over.....	5,096	47	4,180	71	797	15.6	7,352	124	2,695	186	4,347	59.1
75 and over.....	1,814	13	1,279	21	501	27.6	2,888	32	538	52	2,265	78.4
1990												
55 to 64.....	6,991	177	6,414	179	222	3.2	7,411	313	5,711	316	1,071	14.5
65 and over.....	5,964	64	4,988	88	823	13.8	8,811	204	3,570	264	4,773	54.2
75 and over.....	2,220	17	1,645	26	532	23.9	3,686	53	777	79	2,776	75.3
2000												
55 to 64.....	7,922	401	6,944	353	224	2.8	8,354	343	6,589	492	930	11.1
65 and over.....	9,080	161	7,662	202	1,056	11.6	12,583	420	5,818	447	5,898	46.9
75 and over.....	3,134	32	2,426	42	635	20.2	5,682	145	1,465	161	3,911	68.8
<b>Malaysia</b>												
1970												
55 to 64.....	252	10	215	6	21	8.3	228	4	123	7	93	40.9
65 and over.....	164	9	120	6	29	17.7	152	4	43	6	100	65.4
1980												
55 to 64.....	288	9	256	5	19	6.5	299	5	173	17	104	34.8
65 and over.....	234	9	178	7	40	17.2	239	5	71	18	146	60.8
1991												
55 to 64.....	403	10	368	4	20	5.1	419	9	274	13	124	29.6
65 and over.....	305	6	246	5	49	15.9	351	5	127	14	205	58.4
75 and over.....	99	2	70	2	24	24.8	120	2	29	5	84	70.2
2000												
55 to 64.....	594	16	547	4	28	4.7	573	15	404	12	142	24.8
65 and over.....	419	9	344	4	62	14.9	482	8	201	10	262	54.3
75 and over.....	128	2	94	1	30	23.5	162	2	45	4	111	68.7
<b>Pakistan</b>												
1981												
55 to 59.....	859	15	795	2	48	5.6	751	7	605	2	137	18.2
60 and over.....	3,314	86	2,832	7	388	11.7	2,420	64	1,200	7	1,149	47.5
1998												
55 to 64.....	2,855	101	2,496	6	252	8.8	2,461	85	1,683	14	679	27.6
65 and over.....	2,390	109	1,804	6	471	19.7	1,978	116	849	9	1,004	50.8
75 and over.....	817	49	542	2	224	27.4	688	53	207	3	424	61.6

See footnotes at end of table.



Table B-6.  
**Marital Status of the Older Population by Sex, Country, and Age: Selected Years 1969 to 2007—Con.**

(Numbers in thousands)

Country, year, and age	Male						Female					
	Total	Single	Married <sup>1</sup>	Sep- arated/ divorced	Widowed	Percent widowed	Total	Single	Married <sup>1</sup>	Sep- arated/ divorced	Widowed	Percent widowed
<b>Asia—Con.</b>												
<b>Philippines</b>												
1970												
55 to 64.....	713	20	631	5	58	8.1	706	55	462	7	182	25.8
65 and over.....	504	13	381	3	107	21.1	525	38	208	3	276	52.6
1980												
55 to 64.....	969	29	855	7	77	8.0	1,029	73	694	12	250	24.3
65 and over.....	793	25	616	5	146	18.5	838	70	367	7	395	47.1
75 and over.....	228	8	154	1	65	28.4	246	21	67	2	156	63.3
1990												
55 to 64.....	1,252	39	1,116	11	87	6.9	1,313	88	893	18	315	24.0
65 and over.....	949	30	738	7	174	18.3	1,109	97	467	10	535	48.2
75 and over.....	307	11	209	2	86	28.0	379	38	104	3	234	61.8
2000												
55 to 64.....	1,723	64	1,509	24	126	7.3	1,799	107	1,227	33	433	24.0
65 and over.....	1,300	41	996	13	251	19.3	1,610	115	674	17	805	50.0
75 and over.....	410	13	272	3	122	29.8	575	47	158	4	367	63.7
<b>Singapore</b>												
1970												
55 to 64.....	59	4	50	—	5	8.0	55	3	29	—	23	41.2
65 and over.....	31	2	22	—	7	21.5	39	2	9	—	28	71.4
75 and over.....	6	—	3	—	2	34.2	11	1	1	—	9	83.2
1980												
55 to 64.....	67	3	59	1	4	5.6	64	2	39	1	22	34.8
65 and over.....	51	2	39	1	10	18.6	63	3	18	—	40	64.3
75 and over.....	12	1	8	—	4	30.3	19	1	3	—	15	78.6
1990												
55 to 64.....	91	6	78	1	6	6.1	91	3	60	2	26	28.9
65 and over.....	73	4	54	1	15	20.2	89	3	30	1	55	61.8
70 and over.....	44	2	31	—	11	25.5	59	3	16	—	40	68.5
2000												
55 to 64.....	115	7	102	3	3	2.9	120	8	86	5	21	17.8
65 and over.....	102	4	82	2	14	13.8	129	4	52	2	71	55.1
75 and over.....	32	1	23	—	8	23.9	48	1	11	—	35	73.7
<b>South Korea</b>												
1975												
55 to 64.....	784	1	729	3	51	6.5	893	1	468	4	420	47.1
65 and over.....	458	1	356	1	101	22.0	748	1	182	1	564	75.4
1980												
55 to 64.....	895	2	835	3	55	6.2	1,052	1	566	5	480	45.6
65 and over.....	539	1	431	1	106	19.7	907	1	220	1	684	75.4
75 and over.....	117	—	74	—	42	36.2	284	—	33	—	250	88.2
1995												
55 to 64.....	1,597	6	1,499	16	75	4.7	1,811	6	1,187	20	599	33.1
65 and over.....	974	2	815	4	154	15.8	1,665	3	441	6	1,215	73.0
75 and over.....	260	—	186	1	73	28.1	573	1	65	1	506	88.3
2000												
55 to 64.....	1,795	12	1,669	39	76	4.2	1,961	12	1,359	40	550	28.0
65 and over.....	1,287	4	1,099	10	174	13.5	2,083	7	653	15	1,409	67.6
75 and over.....	345	1	257	2	86	24.8	732	2	95	3	632	86.3

See footnotes at end of table.

Table B-6.

**Marital Status of the Older Population by Sex, Country, and Age: Selected Years 1969 to 2007—Con.**

(Numbers in thousands)

Country, year, and age	Male						Female					
	Total	Single	Married <sup>1</sup>	Sep- arated/ divorced	Widowed	Percent widowed	Total	Single	Married <sup>1</sup>	Sep- arated/ divorced	Widowed	Percent widowed
<b>Asia—Con.</b>												
<b>Sri Lanka</b>												
1971												
55 to 64.....	343	25	293	3	22	6.4	275	12	178	2	83	30.1
65 and over.....	292	22	223	2	46	15.6	246	11	100	1	134	54.4
1981												
55 to 64.....	405	26	355	3	22	5.3	359	15	244	2	98	27.3
65 and over.....	339	23	265	2	49	14.4	305	15	136	1	153	50.1
2001												
55 to 64.....	557	33	502	6	15	2.8	590	31	437	8	115	19.4
65 and over.....	488	32	408	4	45	9.1	561	21	321	4	214	38.2
75 and over.....	163	11	127	1	23	14.2	190	7	93	1	89	46.9
<b>Thailand</b>												
1970												
55 to 64.....	688	25	595	14	54	7.9	722	16	434	29	243	33.7
65 and over.....	461	24	334	11	92	19.9	584	12	203	16	354	60.6
1980												
55 to 64.....	932	15	822	17	77	8.3	998	26	613	38	321	32.1
65 and over.....	672	10	502	14	145	21.6	853	17	297	21	518	60.7
70 and over.....	386	6	268	9	104	26.9	528	10	146	11	360	68.2
1990												
55 to 64.....	1,628	53	1,418	29	128	7.9	1,723	56	1,143	58	466	27.0
65 and over.....	1,131	45	836	20	231	20.4	1,363	30	537	32	765	56.1
70 and over.....	667	27	460	12	167	25.1	860	18	275	17	550	63.9
2000												
55 to 64.....	1,981	48	1,769	31	133	6.7	2,211	106	1,530	63	512	23.2
65 and over.....	1,628	27	1,265	21	316	19.4	2,096	64	962	37	1,033	49.3
75 and over.....	477	7	320	6	145	30.4	696	17	218	8	452	65.0
<b>Turkey</b>												
1970												
55 to 64.....	952	17	865	9	60	6.3	947	12	638	13	284	30.0
65 and over.....	685	12	549	6	118	17.2	818	12	308	11	487	59.5
1980												
55 to 64.....	967	22	894	10	42	4.3	976	13	693	13	257	26.3
65 and over.....	955	20	753	9	173	18.1	1,158	15	482	13	648	56.0
1990												
55 to 64.....	1,761	34	1,650	17	59	3.4	1,793	22	1,336	22	414	23.1
65 and over.....	1,091	21	887	10	174	15.9	1,326	18	569	14	725	54.6
2000												
55 to 64.....	1,879	27	1,773	23	57	3.0	2,006	25	1,498	35	448	22.3
65 and over.....	1,748	22	1,479	17	230	13.2	2,109	25	993	28	1,063	50.4
75 and over.....	436	7	319	4	107	24.5	604	8	171	7	417	69.1
<b>Latin America/ Caribbean</b>												
<b>Argentina</b>												
1970												
55 to 64.....	939	119	750	20	50	5.3	993	125	615	26	227	22.8
65 and over.....	724	88	493	14	130	17.9	877	111	308	12	446	50.8
75 and over.....	208	24	117	3	64	30.8	292	37	64	2	189	64.7

See footnotes at end of table.

Table B-6.  
**Marital Status of the Older Population by Sex, Country, and Age: Selected Years 1969 to 2007—Con.**

(Numbers in thousands)

Country, year, and age	Male						Female					
	Total	Single	Married <sup>1</sup>	Sep- arated/ divorced	Widowed	Percent widowed	Total	Single	Married <sup>1</sup>	Sep- arated/ divorced	Widowed	Percent widowed
<b>Latin America/ Caribbean—Con.</b>												
<b>Argentina—Con.</b>												
1980												
55 to 64.....	1,091	116	896	28	50	4.6	1,192	134	756	39	263	22.0
65 and over.....	988	107	706	19	155	15.7	1,303	160	453	20	669	51.4
70 and over.....	590	64	395	10	120	20.4	826	103	223	9	491	59.4
1991												
55 to 64.....	1,129	121	889	62	57	5.1	1,320	127	808	89	296	22.4
65 and over.....	1,139	110	812	41	175	15.4	1,628	176	523	48	881	54.1
75 and over.....	387	37	243	11	96	24.7	648	75	111	11	451	69.6
2001												
55 to 64.....	1,315	120	1,051	93	51	3.9	1,473	142	933	143	255	17.3
65 and over.....	1,457	129	1,050	74	205	14.0	2,131	215	741	100	1,074	50.4
75 and over.....	535	45	349	22	119	22.3	946	101	193	30	623	65.8
<b>Brazil</b>												
1970												
55 to 64.....	2,081	118	1,758	71	134	6.4	2,043	176	1,125	121	622	30.4
65 and over.....	1,397	73	1,015	50	258	18.5	1,544	140	441	70	893	57.8
1980												
55 to 64.....	2,710	143	2,356	78	132	4.9	2,779	232	1,673	157	716	25.8
65 and over.....	2,200	117	1,669	66	348	15.8	2,470	235	793	85	1,356	54.9
1991												
55 to 64.....	3,664	196	3,194	118	156	4.3	4,050	321	2,467	286	975	24.1
65 and over.....	3,138	164	2,434	100	440	14.0	3,738	366	1,296	167	1,909	51.1
70 and over.....	996	54	679	29	233	23.4	1,323	144	253	41	885	66.9
2000												
55 to 64.....	4,535	206	3,964	196	169	3.7	4,859	326	3,118	364	1,051	21.6
65 and over.....	4,168	166	3,268	163	571	13.7	5,109	373	1,918	229	2,589	50.7
70 and over.....	1,421	55	996	50	319	22.4	1,906	154	428	62	1,262	66.2
<b>Chile</b>												
1971												
55 to 64.....	248	25	197	6	19	7.8	276	37	152	13	74	26.8
65 and over.....	201	19	136	5	41	20.5	251	38	75	7	131	52.4
75 and over.....	61	5	35	1	19	30.9	86	13	15	1	56	65.1
1982												
55 to 64.....	303	31	242	10	20	6.5	344	43	203	21	77	22.3
65 and over.....	288	29	198	9	52	18.2	372	53	126	14	179	48.1
75 and over.....	93	9	55	2	26	28.1	137	21	29	3	84	61.2
1992												
55 to 64.....	406	42	323	21	21	5.1	462	58	281	35	88	19.1
65 and over.....	373	38	258	15	62	16.7	504	64	181	23	236	46.8
75 and over.....	132	12	81	5	34	25.7	208	27	49	7	125	60.2
<b>Colombia</b>												
1973												
55 to 64.....	396	43	317	9	27	6.8	404	69	207	16	111	27.5
65 and over.....	299	32	208	7	53	17.7	342	61	106	8	167	48.8
1985												
55 to 59.....	346	27	290	14	14	4.2	352	41	204	33	74	21.1
60 and over.....	784	66	587	31	101	12.9	832	107	309	51	364	43.8

See footnotes at end of table.

Table B-6.  
**Marital Status of the Older Population by Sex, Country, and Age: Selected Years 1969 to 2007—Con.**

(Numbers in thousands)

Country, year, and age	Male						Female					
	Total	Single	Married <sup>1</sup>	Sep- arated/ divorced	Widowed	Percent widowed	Total	Single	Married <sup>1</sup>	Sep- arated/ divorced	Widowed	Percent widowed
<b>Latin America/ Caribbean—Con.</b>												
<b>Colombia—Con.</b>												
1993												
55 to 64.....	778	69	626	42	41	5.2	827	99	449	89	190	23.0
65 and over.....	676	57	479	34	106	15.7	751	95	245	48	363	48.3
75 and over.....	231	19	146	10	56	24.1	274	36	58	12	168	61.3
<b>Costa Rica</b>												
1973												
55 to 64.....	39	4	32	1	2	4.9	39	6	23	3	7	18.1
65 and over.....	33	4	23	1	5	15.8	33	6	12	1	14	40.7
75 and over.....	11	1	6	—	3	26.4	12	2	3	—	6	53.7
1984												
55 to 64.....	55	5	45	2	2	3.5	56	9	34	5	9	15.2
65 and over.....	52	5	36	3	8	14.5	56	10	21	3	22	39.2
2000												
55 to 64.....	95	9	76	7	2	2.6	98	13	59	13	13	12.9
65 and over.....	101	10	69	8	13	13.3	113	17	43	10	43	38.3
75 and over.....	38	4	23	3	9	22.3	46	7	11	3	24	53.1
<b>Guatemala</b>												
1973												
55 to 64.....	100	8	83	1	8	7.9	94	13	53	2	26	27.9
65 and over.....	74	7	52	1	15	20.1	75	12	25	1	37	50.0
75 and over.....	24	2	14	—	7	29.7	25	4	6	—	15	61.2
1981												
55 to 64.....	126	6	109	2	9	7.2	117	8	70	7	32	27.1
65 and over.....	93	4	70	2	17	18.6	94	8	33	4	49	51.9
75 and over.....	32	1	21	1	9	27.7	34	3	8	1	22	64.6
1990												
55 to 64.....	195	8	172	5	10	5.1	199	8	118	17	56	28.2
65 and over.....	146	3	116	3	23	16.0	159	4	61	10	84	52.8
<b>Jamaica</b>												
1970												
55 to 64.....	54	16	34	1	2	4.1	50	14	27	1	8	16.1
65 and over.....	44	11	26	1	5	11.5	55	20	16	1	18	32.8
1982												
55 to 64.....	50	15	31	2	2	4.1	55	17	28	1	8	14.5
65 and over.....	61	15	37	2	8	12.7	73	25	24	1	23	32.0
1991												
55 to 64.....	58	20	33	3	2	4.0	63	20	31	3	9	14.3
65 and over.....	75	17	44	3	11	14.6	92	27	29	2	33	35.7
2001												
55 to 64.....	69	25	39	4	2	3.4	70	25	33	3	8	11.9
65 and over.....	89	20	51	4	13	15.2	106	29	35	3	39	36.9
75 and over.....	36	7	19	1	9	23.7	49	13	11	1	24	48.2
<b>Mexico</b>												
1970												
55 to 64.....	953	56	824	20	54	5.6	977	81	623	43	229	23.5
65 and over.....	859	82	645	21	111	12.9	932	121	392	37	383	41.1
75 and over.....	272	37	177	7	50	18.5	329	55	102	12	159	48.5

See footnotes at end of table.

Table B-6.  
**Marital Status of the Older Population by Sex, Country, and Age: Selected Years 1969 to 2007—Con.**

(Numbers in thousands)

Country, year, and age	Male						Female					
	Total	Single	Married <sup>1</sup>	Sep- arated/ divorced	Widowed	Percent widowed	Total	Single	Married <sup>1</sup>	Sep- arated/ divorced	Widowed	Percent widowed
<b>Latin America/ Caribbean—Con.</b>												
<b>Mexico—Con.</b>												
1980												
55 to 64.....	1,274	65	1,114	24	70	5.5	1,305	99	860	59	287	22.0
65 and over.....	1,203	62	937	24	179	14.9	1,353	118	618	40	578	42.7
1990												
55 to 64.....	1,675	83	1,477	36	79	4.7	1,797	126	1,226	89	356	19.8
65 and over.....	1,556	77	1,207	38	234	15.0	1,766	139	796	64	767	43.4
2000												
55 to 64.....	2,275	116	1,947	96	116	5.1	2,472	171	1,567	221	513	20.8
65 and over.....	2,197	102	1,617	86	392	17.9	2,531	171	986	139	1,236	48.8
75 and over.....	883	38	537	30	278	31.5	999	70	247	38	644	64.4
<b>Peru</b>												
1972												
55 to 64.....	281	21	227	6	27	9.5	289	32	169	9	78	26.9
65 and over.....	236	19	161	4	52	22.0	279	36	99	5	139	49.9
75 and over.....	148	13	95	2	38	26.0	182	25	54	3	100	55.1
1981												
55 to 64.....	368	23	307	8	30	8.1	364	30	233	15	86	23.7
65 and over.....	323	20	231	6	66	20.4	356	30	140	9	177	49.6
1993												
55 to 64.....	540	36	456	14	34	6.4	543	49	366	26	102	18.9
65 and over.....	481	31	359	10	81	16.8	531	49	241	17	225	42.3
<b>Uruguay</b>												
1975												
55 to 64.....	125	18	97	5	5	4.1	132	18	80	8	28	20.8
65 and over.....	118	15	81	5	18	14.8	151	23	48	5	75	49.5
75 and over.....	38	5	22	1	10	25.9	59	10	11	2	37	62.1
1985												
55 to 64.....	141	18	110	8	5	3.6	156	16	96	12	32	20.3
65 and over.....	138	16	97	6	19	13.6	191	25	61	9	96	50.4
75 and over.....	49	5	31	2	11	22.9	79	11	14	2	51	64.2
1996												
55 to 64.....	137	16	106	11	5	3.3	155	14	97	18	27	17.5
65 and over.....	166	19	117	9	21	12.6	239	27	82	15	115	48.0
75 and over.....	60	6	38	3	13	21.0	104	13	21	4	66	63.1

– Represents or rounds to zero.

<sup>1</sup> Data for “Married” for Latin American/Caribbean countries generally include people living in consensual unions.

<sup>2</sup> For Denmark 2000 and 2007, “married” includes people who were separated.

<sup>3</sup> Data for the Czech Republic prior to 1991 refer to the former Czechoslovakia.

<sup>4</sup> Data for China 2000 are from a 9.5 percent sample of census returns and are not weighted to the national total.

Sources: United Nations Department of Economic and Social Affairs, various issues of the *Demographic Yearbook*; U.S. Census Bureau, Population Division data files; and country sources.

Table B-7.  
**Dependency Ratios by Country: 2000, 2020, and 2040**

Country	Total <sup>1</sup>			Youth <sup>2</sup>			Older <sup>3</sup>		
	2000	2020	2040	2000	2020	2040	2000	2020	2040
<b>Western Europe</b>									
Austria . . . . .	62	64	92	37	30	34	25	34	57
Belgium . . . . .	68	71	88	39	35	37	28	36	51
Denmark . . . . .	63	73	88	39	39	41	24	35	47
France . . . . .	71	78	88	44	43	41	27	36	47
Germany . . . . .	60	67	92	34	29	34	26	38	58
Greece . . . . .	64	67	86	35	30	31	29	36	54
Italy . . . . .	60	66	95	31	28	31	29	38	63
Norway . . . . .	70	71	88	44	39	40	26	33	47
Sweden . . . . .	71	76	86	41	37	38	29	39	48
United Kingdom . . . . .	69	67	82	43	35	36	26	32	46
<b>Eastern Europe</b>									
Bulgaria . . . . .	65	68	81	37	31	30	27	36	51
Czech Republic . . . . .	59	64	80	37	29	28	22	35	51
Hungary . . . . .	61	64	76	38	32	31	24	32	45
Poland . . . . .	67	61	74	46	31	29	20	30	45
Russia . . . . .	63	60	71	42	34	32	20	26	39
Ukraine . . . . .	65	58	71	41	30	29	23	28	43
<b>Northern America/Oceania</b>									
Australia . . . . .	67	70	82	46	40	39	21	30	43
Canada . . . . .	63	66	81	42	36	37	21	30	44
New Zealand . . . . .	69	66	76	49	41	39	19	25	38
United States . . . . .	69	75	86	48	46	48	21	28	38
<b>Africa</b>									
Egypt . . . . .	98	74	69	90	62	49	8	12	20
Kenya . . . . .	135	106	63	129	99	53	6	7	10
Malawi . . . . .	152	138	104	146	132	99	7	7	6
Morocco . . . . .	103	69	68	93	58	47	9	11	21
South Africa . . . . .	95	70	64	86	57	47	9	13	16
Tunisia . . . . .	87	55	66	75	42	35	11	13	30
Uganda . . . . .	179	166	148	173	161	143	7	5	5
Zimbabwe . . . . .	133	98	172	125	91	64	8	8	9
<b>Asia</b>									
Bangladesh . . . . .	114	85	75	107	77	62	7	9	14
China . . . . .	68	58	75	56	39	36	12	19	40
India . . . . .	93	75	72	85	63	49	9	13	23
Indonesia . . . . .	84	66	68	75	54	43	9	13	25
Israel . . . . .	86	76	74	67	53	44	18	22	30
Japan . . . . .	61	80	97	33	29	29	28	51	68
Malaysia . . . . .	96	79	78	88	66	57	8	12	21
Pakistan . . . . .	128	80	65	119	72	50	9	9	14
Philippines . . . . .	106	80	71	98	70	54	8	10	17
Singapore . . . . .	46	46	90	35	24	27	10	22	63
South Korea . . . . .	57	51	84	46	28	31	11	22	53
Sri Lanka . . . . .	74	67	73	62	48	40	12	19	33
Thailand . . . . .	65	58	75	55	39	37	11	19	38
Turkey . . . . .	83	58	66	72	44	37	11	14	29
<b>Latin America/Caribbean</b>									
Argentina . . . . .	86	71	68	67	49	39	19	22	29
Brazil . . . . .	79	59	67	70	44	38	9	15	29
Chile . . . . .	77	64	72	64	44	39	13	20	33
Colombia . . . . .	86	71	75	77	57	49	9	14	26
Costa Rica . . . . .	90	64	68	80	50	40	10	14	27
Guatemala . . . . .	141	94	68	133	84	56	8	10	13
Jamaica . . . . .	113	78	65	98	64	46	15	15	19
Mexico . . . . .	95	71	75	85	57	48	10	14	27
Peru . . . . .	93	67	66	84	55	43	9	13	23
Uruguay . . . . .	82	69	73	58	45	39	24	25	34

<sup>1</sup> Total dependency ratio is the number of people aged 0 to 19 years and 65 years and over per 100 people aged 20 to 64. Youth and older ratios may not sum to total ratio due to rounding.

<sup>2</sup> Youth dependency ratio is the number of people aged 0 to 19 per 100 people aged 20 to 64.

<sup>3</sup> Older dependency ratio is the number of people aged 65 and over per 100 people aged 20 to 64.

Source: U.S. Census Bureau, International Data Base, accessed on January 6, 2008.

Table B-8.  
**Labor Force Participation Rates by Sex, Age, and Country: Selected Years 1969 to 2006**  
(In percent)

Country and year	Male						Female					
	25 to 44 years	45 to 49 years	50 to 54 years	55 to 59 years	60 to 64 years	65 years and over	25 to 44 years	45 to 49 years	50 to 54 years	55 to 59 years	60 to 64 years	65 years and over
<b>Western Europe</b>												
<b>Austria</b>												
1971 .....	97.1	95.8	92.7	83.7	44.9	8.0	52.8	53.7	48.5	35.8	13.2	3.2
1981 .....	96.5	96.3	91.5	77.3	23.3	3.1	62.2	57.3	53.5	32.4	9.5	1.8
1991 .....	94.9	95.1	89.8	63.1	12.3	1.7	69.9	65.1	56.3	23.1	4.9	0.7
1998 .....	94.3	93.6	88.4	63.2	13.2	4.4	76.9	72.6	63.6	24.8	8.4	1.9
2006 .....	94.4	93.1	87.6	69.1	21.9	5.5	81.7	82.6	75.0	41.9	10.1	2.2
<b>Belgium</b>												
1970 .....	96.2	92.2	89.2	82.3	63.8	6.8	39.1	30.8	27.6	20.0	7.6	2.2
1977 .....	96.8	92.4	87.7	79.2	42.1	4.2	51.1	33.3	27.3	18.6	5.8	1.2
1981 .....	94.5	90.8	85.7	70.7	32.3	3.3	60.1	38.2	30.7	17.3	5.7	1.0
1997 .....	94.4	90.5	81.6	49.2	18.4	1.9	77.0	59.5	44.2	21.8	4.6	0.7
2006 .....	93.6	91.4	85.2	58.3	22.6	2.7	82.0	72.8	61.1	36.2	10.3	1.0
<b>Denmark</b>												
1970 .....	93.4	96.3	94.8	91.1	81.3	23.5	55.5	54.4	49.5	39.8	24.9	4.6
1981 .....	94.4	93.5	91.4	87.8	60.0	23.2	84.2	76.1	67.4	55.8	31.5	6.3
1993 .....	93.8	93.9	90.2	80.6	45.5	10.1	87.7	87.7	79.4	63.6	27.1	3.4
2006 .....	93.1	92.2	89.2	85.3	46.7	<sup>1</sup> 20.7	85.6	87.2	83.4	77.0	28.2	<sup>1</sup> 8.4
<b>France</b>												
1975 .....	96.2	95.4	92.1	81.8	54.6	10.7	55.0	49.4	48.2	42.1	27.9	5.0
1984 .....	95.4	95.0	90.8	70.0	29.9	4.3	71.3	61.0	54.1	41.4	18.0	2.1
1996 .....	95.8	95.0	92.6	70.4	16.4	2.3	81.3	80.9	71.5	51.7	15.2	2.0
2005 .....	94.6	94.1	90.3	62.5	15.4	1.6	80.8	83.2	77.3	53.4	13.4	0.8
<b>Germany<sup>2</sup></b>												
1970 .....	96.7	95.9	93.2	86.8	68.8	16.0	47.4	48.3	42.8	34.5	17.7	5.7
1980 .....	96.1	96.8	93.3	82.3	44.2	7.4	57.1	52.2	47.2	38.7	13.0	3.0
1988 .....	94.1	96.4	93.2	79.8	34.5	4.9	64.6	60.9	53.7	41.1	11.1	1.8
1996 .....	92.9	94.5	90.4	73.9	28.7	4.4	74.8	74.7	67.4	50.5	11.3	1.6
2006 .....	93.8	94.3	91.2	82.0	42.3	5.0	79.7	83.5	78.7	65.6	24.4	2.2
<b>Greece</b>												
1971 .....	94.2	93.4	89.5	82.3	65.9	31.9	32.2	30.4	26.9	22.3	17.2	6.7
1981 .....	96.8	95.1	90.0	81.1	61.7	26.2	33.4	28.9	25.8	20.0	13.4	5.0
1987 .....	90.1	98.0	84.2	74.3	53.5	14.0	52.2	43.9	37.2	29.3	22.0	5.1
1997 .....	96.2	95.2	89.2	75.0	47.8	10.7	64.4	49.9	39.3	30.7	20.3	3.4
2006 .....	95.4	95.6	89.4	74.0	45.2	7.4	74.2	64.0	51.3	33.5	21.8	2.1
<b>Italy</b>												
1971 .....	95.5	92.1	87.2	75.0	40.6	13.4	31.8	29.7	26.3	16.9	9.9	3.2
1981 .....	96.2	93.2	85.7	65.1	29.1	6.9	49.8	36.2	30.2	16.9	8.0	1.5
1989 .....	95.6	95.6	87.5	67.8	35.2	7.9	59.5	44.7	34.1	20.2	9.8	2.2
1996 .....	91.2	93.1	79.3	58.9	30.6	6.0	59.8	49.0	37.1	21.5	8.2	1.8
2006 .....	91.2	94.0	89.0	58.0	28.9	6.1	67.0	62.3	54.0	32.8	10.2	1.2
<b>Norway</b>												
1970 .....	94.3	94.1	91.8	87.7	79.0	25.7	29.9	34.8	35.1	32.0	24.5	5.6
1980 .....	94.6	94.0	90.9	88.7	74.1	<sup>3</sup> 34.3	67.1	76.0	67.5	58.1	39.8	<sup>3</sup> 13.0
1990 .....	92.4	93.9	89.2	82.0	64.2	<sup>3</sup> 21.2	79.1	83.5	74.5	62.0	46.5	<sup>3</sup> 12.0
2000 .....	91.7	91.7	89.9	84.8	60.6	<sup>3</sup> 13.5	83.6	86.0	80.8	71.8	48.4	<sup>3</sup> 8.5
2006 .....	91.2	90.7	87.7	82.9	63.0	<sup>3</sup> 17.8	83.5	84.1	81.5	71.2	51.2	<sup>3</sup> 10.6
<b>Sweden</b>												
1970 .....	90.4	93.2	92.3	88.9	76.6	16.4	57.1	62.8	57.8	48.1	30.6	4.1
1980 .....	90.6	92.0	89.8	84.4	65.9	8.1	77.0	82.9	77.8	66.4	41.4	2.6
1990 .....	89.6	91.6	89.5	84.1	63.9	10.6	87.6	89.8	85.8	76.8	53.1	3.7
2000 .....	89.4	90.6	89.9	83.8	56.2	(NA)	84.0	87.2	85.7	79.4	48.2	(NA)
2006 .....	92.3	90.9	89.8	84.9	66.2	(NA)	85.1	87.2	85.4	80.0	58.3	(NA)

See footnotes at end of table.

Table B-8.  
**Labor Force Participation Rates by Sex, Age, and Country: Selected Years 1969 to 2006—Con.**

(In percent)

Country and year	Male						Female					
	25 to 44 years	45 to 49 years	50 to 54 years	55 to 59 years	60 to 64 years	65 years and over	25 to 44 years	45 to 49 years	50 to 54 years	55 to 59 years	60 to 64 years	65 years and over
<b>Western Europe—Con.</b>												
<b>United Kingdom<sup>4</sup></b>												
1971 .....	98.0	98.1	97.1	95.1	86.4	19.4	50.4	61.3	58.9	50.7	27.8	6.4
1981 .....	97.5	97.3	95.7	91.5	74.6	10.7	59.4	68.5	63.5	52.0	22.5	3.7
1993 .....	94.5	92.8	88.1	75.7	52.2	7.4	73.5	77.9	70.0	54.5	24.7	3.5
2000 .....	<sup>5</sup> 88.6	(NA)	<sup>6</sup> 68.9	(NA)	(NA)	7.4	<sup>5</sup> 73.5	(NA)	<sup>7</sup> 64.0	(NA)	(NA)	<sup>8</sup> 8.4
2006 .....	<sup>5</sup> 88.5	(NA)	<sup>6</sup> 72.3	(NA)	(NA)	9.7	<sup>5</sup> 74.2	(NA)	<sup>7</sup> 68.6	(NA)	(NA)	<sup>8</sup> 11.4
<b>Eastern Europe</b>												
<b>Bulgaria</b>												
1975 .....	96.8	95.7	92.0	86.5	33.6	10.3	92.7	86.4	75.4	26.1	8.2	1.7
1985 .....	96.4	94.6	88.1	80.9	39.2	15.2	95.3	91.0	83.6	32.0	16.5	4.3
2006 .....	86.7	84.1	79.2	66.1	38.6	4.6	79.2	82.8	76.5	53.4	11.7	1.5
<b>Czech Republic<sup>9</sup></b>												
1970 .....	98.3	96.0	93.2	85.0	33.3	14.6	79.7	77.3	70.1	36.5	18.2	5.2
1980 .....	98.2	96.0	92.7	84.2	46.3	19.5	91.8	88.1	79.9	40.8	21.5	6.5
1991 .....	97.9	95.5	91.5	80.0	28.4	11.6	95.1	93.4	85.7	31.1	16.2	4.9
1999 .....	96.5	94.9	90.1	77.1	27.5	7.2	79.9	90.8	81.5	33.2	12.9	2.7
2006 .....	95.8	94.6	90.6	83.1	36.1	6.6	77.3	91.8	88.2	51.2	13.1	2.5
<b>Hungary</b>												
1970 .....	98.1	95.4	91.8	84.4	43.7	16.7	68.6	64.0	56.6	29.2	17.1	5.8
1980 .....	97.7	92.9	86.2	72.2	13.2	4.0	79.2	77.5	67.4	18.8	8.7	2.9
1996 .....	90.0	83.1	70.0	46.1	9.2	<sup>3</sup> 4.3	69.8	76.1	55.4	15.5	6.0	<sup>3</sup> 2.1
2006 .....	90.7	82.5	74.4	61.3	19.6	<sup>3</sup> 4.3	71.7	78.9	71.7	44.1	9.4	<sup>3</sup> 1.6
<b>Poland</b>												
1970 .....	96.6	95.1	94.0	90.9	83.0	56.4	78.3	79.2	75.9	68.1	51.1	33.0
1978 .....	96.1	92.1	87.1	81.5	62.4	34.9	79.2	78.5	71.6	57.9	37.4	19.4
1988 .....	95.1	89.6	82.4	72.0	53.6	32.5	78.5	81.2	71.1	50.6	34.3	19.0
1996 .....	92.9	85.1	76.8	55.2	33.4	15.3	79.5	79.1	63.1	35.0	19.2	8.5
2006 .....	92.5	84.7	75.7	51.6	26.8	8.2	79.3	77.9	59.8	25.3	12.4	3.3
<b>Russia</b>												
1989 .....	97.3	95.8	91.7	79.3	35.4	14.2	93.8	93.7	83.8	34.8	20.4	6.4
1992 .....	<sup>5</sup> 92.1	(NA)	93.9	80.5	38.1	13.3	<sup>5</sup> 88.9	(NA)	83.6	43.0	21.0	5.7
1999 .....	91.0	88.6	85.3	65.2	29.2	6.4	84.4	86.8	78.9	33.7	16.0	2.5
2006 .....	93.2	89.0	84.8	70.2	39.7	9.4	87.5	88.2	80.6	47.0	23.6	4.6
<b>Ukraine</b>												
1989 .....	97.3	95.6	89.9	78.2	32.0	10.9	93.4	93.3	86.0	29.5	15.3	4.5
1999 .....	89.2	86.3	76.4	69.7	28.3	<sup>9</sup> 9.8	83.3	84.3	70.1	33.4	16.7	<sup>9</sup> 6.0
2005 .....	88.5	84.3	79.1	67.6	32.2	<sup>10</sup> 22.7	79.6	81.1	72.9	37.6	24.7	<sup>10</sup> 17.3
<b>Northern America/ Oceania</b>												
<b>Australia</b>												
1971 .....	94.8	<sup>11</sup> 93.0	(NA)	88.4	75.6	22.2	41.5	<sup>11</sup> 40.0	(NA)	28.3	16.0	4.2
1981 .....	94.8	92.5	89.4	81.3	53.1	12.3	56.2	56.5	46.3	32.8	15.5	4.9
1991 .....	94.3	<sup>11</sup> 89.6	(NA)	73.8	50.0	8.9	68.5	<sup>11</sup> 62.8	(NA)	36.0	15.2	2.5
1999 .....	91.8	89.5	85.1	72.5	46.7	9.6	69.5	73.8	65.0	44.6	18.3	3.1
2006 .....	89.9	89.2	86.1	75.7	56.4	12.1	73.0	78.3	73.4	57.9	33.5	4.3
<b>Canada</b>												
1971 .....	92.7	91.3	89.1	84.9	74.1	23.6	44.2	45.4	43.3	38.7	29.1	8.3
1981 .....	95.3	93.6	90.9	84.4	68.8	17.3	65.2	59.6	52.1	41.9	28.3	6.0
1991 .....	94.2	93.1	89.5	78.3	54.1	14.4	79.1	76.3	66.4	49.9	28.1	5.7
2001 .....	92.1	91.1	86.4	72.2	46.5	9.4	80.4	79.8	72.7	53.3	27.4	3.4
2006 .....	92.0	90.8	87.8	76.1	53.3	12.1	81.8	82.6	78.1	62.3	37.1	5.2

See footnotes at end of table.



Table B-8.  
**Labor Force Participation Rates by Sex, Age, and Country: Selected Years 1969 to 2006—Con.**

(In percent)

Country and year	Male						Female					
	25 to 44 years	45 to 49 years	50 to 54 years	55 to 59 years	60 to 64 years	65 years and over	25 to 44 years	45 to 49 years	50 to 54 years	55 to 59 years	60 to 64 years	65 years and over
<b>Northern America/Oceania—Con.</b>												
<b>New Zealand</b>												
1971 .....	98.4	98.0	96.3	92.1	69.2	21.3	33.2	40.0	35.2	27.5	15.5	3.5
1981 .....	96.0	95.8	94.1	87.5	45.7	10.9	45.3	52.5	43.7	30.9	11.7	1.9
1992 .....	93.4	94.2	89.5	80.0	33.5	8.8	69.2	79.7	65.7	49.9	15.7	2.9
1999 .....	89.0	90.7	88.4	81.2	57.4	10.4	71.1	79.9	73.6	60.1	32.5	3.9
2006 .....	91.1	92.6	91.6	87.2	73.1	16.8	74.3	81.9	80.0	71.7	50.0	8.0
<b>United States</b>												
1970 .....	94.3	93.5	91.4	86.8	73.0	24.8	47.5	53.0	52.0	47.4	36.1	10.0
1980 .....	93.4	92.0	88.5	80.6	60.4	19.3	64.8	61.5	56.3	48.4	34.0	8.2
1991 .....	93.9	92.2	88.4	79.0	54.8	15.8	74.9	75.4	67.8	55.7	35.1	8.6
2000 .....	93.0	90.1	86.8	77.1	54.8	17.5	76.8	79.1	74.1	61.2	40.1	9.4
2006 .....	88.6	<sup>11</sup> 85.7	(NA)	76.3	57.5	19.7	75.2	<sup>11</sup> 64.7	(NA)	64.7	45.4	10.7
<b>Africa</b>												
<b>Egypt</b>												
1976 .....	97.6	99.0	98.0	96.0	77.9	40.9	7.5	3.5	3.1	2.8	2.2	1.0
1986 .....	96.2	94.2	91.3	88.8	68.3	25.5	13.2	6.0	4.3	3.4	2.0	0.7
1995 .....	<sup>12</sup> 84.6	<sup>13</sup> 98.1	<sup>7</sup> 97.9	(NA)	76.4	36.5	<sup>12</sup> 28.8	<sup>13</sup> 25.5	<sup>7</sup> 16.0	(NA)	6.6	2.1
1999 .....	<sup>12</sup> 90.2	<sup>13</sup> 98.1	<sup>7</sup> 97.9	(NA)	63.5	32.1	<sup>12</sup> 26.2	<sup>13</sup> 22.3	<sup>7</sup> 14.2	(NA)	5.6	2.3
<b>Malawi</b>												
1977 .....	95.3	<sup>11</sup> 96.1	(NA)	<sup>14</sup> 94.4	(NA)	83.6	67.4	<sup>11</sup> 72.6	(NA)	<sup>14</sup> 69.9	(NA)	55.3
1987 .....	97.5	98.2	96.8	94.3	94.2	85.3	89.9	90.5	89.4	89.8	84.3	71.9
1998 .....	96.2	98.3	98.1	97.9	97.2	93.8	84.5	89.9	90.5	90.9	90.0	84.0
<b>Morocco</b>												
1971 .....	95.8	94.5	91.6	88.9	63.3	33.5	11.3	15.0	18.9	22.5	7.7	3.8
1982 .....	97.1	96.6	93.3	89.5	68.9	42.1	17.9	14.1	14.6	14.6	11.2	5.3
1990 .....	94.3	<sup>15</sup> 90.3	(NA)	(NA)	(NA)	<sup>8</sup> 38.1	32.5	<sup>15</sup> 17.1	(NA)	(NA)	(NA)	<sup>8</sup> 8.9
1999 .....	95.0	<sup>15</sup> 90.0	(NA)	(NA)	(NA)	<sup>8</sup> 43.7	35.4	<sup>15</sup> 30.1	(NA)	(NA)	(NA)	<sup>8</sup> 13.0
2005 .....	94.6	<sup>15</sup> 87.6	(NA)	(NA)	(NA)	<sup>8</sup> 40.0	34.1	<sup>15</sup> 30.4	(NA)	(NA)	(NA)	<sup>8</sup> 12.5
<b>South Africa</b>												
1970 .....	97.3	<sup>11</sup> 96.6	(NA)	<sup>14</sup> 85.4	(NA)	44.4	42.3	<sup>11</sup> 35.7	(NA)	<sup>14</sup> 22.5	(NA)	5.6
1980 .....	<sup>16</sup> 89.7	(NA)	(NA)	<sup>14</sup> 77.3	(NA)	34.7	<sup>16</sup> 45.3	(NA)	(NA)	<sup>14</sup> 24.1	(NA)	5.9
1991 .....	<sup>16</sup> 90.8	(NA)	(NA)	<sup>14</sup> 70.5	(NA)	21.3	<sup>16</sup> 60.2	(NA)	(NA)	<sup>14</sup> 28.5	(NA)	5.2
2003 .....	82.9	80.8	73.7	63.5	40.6	25.6	65.4	62.6	50.9	38.4	15.2	9.6
<b>Tunisia</b>												
1975 .....	97.9	97.3	94.2	86.0	66.5	38.0	16.8	14.1	13.0	11.3	8.6	4.8
1984 .....	96.9	96.2	92.8	82.1	59.2	38.5	23.0	12.9	11.6	9.8	4.4	3.5
1994 .....	94.3	95.6	90.1	78.3	54.6	31.5	26.8	17.6	12.6	9.6	7.3	3.3
1997 .....	95.4	95.6	90.4	78.4	54.1	34.0	29.2	21.6	14.4	12.2	7.7	3.5
<b>Uganda</b>												
1991 .....	94.8	95.5	94.8	93.3	89.6	68.9	71.4	74.2	73.3	72.0	64.8	42.6
2003 .....	(NA)	97.1	94.6	93.9	91.4	72.9	(NA)	93.5	92.2	87.1	80.3	53.7
<b>Zimbabwe</b>												
1969 .....	69.8	61.3	52.5	49.1	43.1	24.9	11.8	10.2	9.8	9.2	9.0	2.7
1982 .....	93.8	93.9	92.5	90.4	(NA)	<sup>8</sup> 69.1	50.3	52.4	50.6	50.7	(NA)	<sup>8</sup> 31.5
1992 .....	96.0	95.1	92.2	88.8	77.5	52.0	51.3	54.0	49.7	47.1	40.0	21.7
1999 .....	95.1	95.6	94.2	87.8	84.1	74.1	73.6	83.0	84.4	78.8	77.8	60.7

See footnotes at end of table.

Table B-8.  
**Labor Force Participation Rates by Sex, Age, and Country: Selected Years 1969 to 2006—Con.**

(In percent)

Country and year	Male						Female					
	25 to 44 years	45 to 49 years	50 to 54 years	55 to 59 years	60 to 64 years	65 years and over	25 to 44 years	45 to 49 years	50 to 54 years	55 to 59 years	60 to 64 years	65 years and over
<b>Asia</b>												
<b>Bangladesh</b>												
1974 .....	97.9	<sup>11</sup> 98.3	(NA)	<sup>14</sup> 95.2	(NA)	84.2	3.0	<sup>11</sup> 3.6	(NA)	<sup>14</sup> 4.0	(NA)	3.3
1981 .....	92.4	93.6	90.6	90.7	84.7	68.7	4.7	4.4	4.7	4.4	4.5	3.6
1986 .....	99.4	99.7	99.3	98.0	93.4	70.4	10.6	10.3	10.8	9.8	9.0	10.9
2003 .....	99.2	99.5	99.2	97.3	87.8	66.1	27.3	22.6	19.9	17.1	13.4	8.7
<b>China</b>												
1982 .....	98.7	97.5	91.4	83.0	63.7	30.1	87.8	70.6	50.9	32.9	16.9	4.7
1990 .....	98.9	97.9	93.5	83.9	63.7	33.6	90.8	81.1	62.0	45.1	27.4	8.4
2000 .....	95.0	94.2	89.3	79.6	60.2	33.7	84.4	78.5	66.8	54.5	38.9	17.2
<b>India</b>												
1971 .....	<sup>12</sup> 96.0	<sup>13</sup> 97.1	<sup>7</sup> 94.0	(NA)	(NA)	<sup>8</sup> 73.8	<sup>12</sup> 20.8	<sup>13</sup> 22.4	<sup>7</sup> 19.4	(NA)	(NA)	<sup>8</sup> 10.5
1981 .....	<sup>12</sup> 97.8	<sup>13</sup> 98.1	<sup>7</sup> 93.8	(NA)	(NA)	<sup>8</sup> 65.5	<sup>12</sup> 36.9	<sup>13</sup> 37.0	<sup>7</sup> 30.3	(NA)	(NA)	<sup>8</sup> 14.3
1991 .....	<sup>12</sup> 94.6	<sup>13</sup> 96.9	<sup>7</sup> 92.6	(NA)	<sup>17</sup> 71.4	<sup>18</sup> 42.3	<sup>12</sup> 38.7	<sup>13</sup> 41.5	<sup>7</sup> 35.5	(NA)	<sup>17</sup> 20.8	<sup>18</sup> 8.2
2001 .....	<sup>12</sup> 93.3	<sup>13</sup> 97.0	<sup>7</sup> 92.0	(NA)	<sup>17</sup> 69.7	<sup>18</sup> 45.4	<sup>12</sup> 44.6	<sup>13</sup> 47.3	<sup>7</sup> 40.9	(NA)	<sup>17</sup> 26.3	<sup>18</sup> 12.0
<b>Indonesia</b>												
1971 .....	94.2	93.4	90.6	86.0	79.3	62.9	39.9	45.4	43.5	40.5	35.2	24.5
1982 .....	97.3	97.2	93.0	87.4	76.8	57.9	48.7	56.7	51.1	50.4	39.3	23.2
1992 .....	96.8	97.6	93.8	89.6	79.7	56.8	55.4	60.5	57.7	52.2	42.7	25.1
1999 .....	97.2	98.0	95.7	87.6	(NA)	<sup>8</sup> 66.5	57.7	62.2	60.0	54.3	(NA)	<sup>8</sup> 34.0
2005 .....	98.5	98.6	97.0	91.2	(NA)	<sup>8</sup> 68.5	54.0	61.8	59.9	57.4	(NA)	<sup>8</sup> 36.6
<b>Israel</b>												
1972 .....	90.7	<sup>11</sup> 92.7	(NA)	<sup>14</sup> 86.3	(NA)	34.5	35.9	<sup>11</sup> 33.8	(NA)	<sup>14</sup> 23.7	(NA)	7.2
1983 .....	88.5	91.5	89.1	84.2	78.2	32.2	57.6	51.1	43.2	36.7	22.0	9.2
1996 .....	84.4	<sup>11</sup> 87.4	(NA)	75.9	59.0	16.9	65.1	<sup>11</sup> 65.8	(NA)	44.7	19.9	5.1
2006 .....	82.6	<sup>11</sup> 84.0	(NA)	76.5	60.2	16.5	71.1	<sup>11</sup> 70.6	(NA)	58.3	32.6	5.2
<b>Japan</b>												
1970 .....	98.4	98.1	97.3	94.2	85.8	54.5	52.6	64.7	60.9	53.8	43.3	19.7
1980 .....	98.3	98.0	97.3	94.0	81.5	46.0	52.9	62.3	58.7	50.7	38.8	16.1
1989 .....	97.0	97.6	96.0	91.6	71.4	35.8	61.1	70.7	64.2	52.2	39.2	15.7
1999 .....	97.1	97.5	97.1	94.7	74.1	35.5	64.5	71.8	67.9	58.7	39.8	14.9
2006 .....	96.1	96.9	95.7	93.2	70.9	29.3	68.0	74.0	70.5	60.3	40.2	13.0
<b>Malaysia</b>												
1970 .....	93.4	91.1	86.7	76.4	66.1	46.6	40.6	42.2	38.2	30.7	25.1	13.7
1980 .....	97.3	96.1	92.2	78.1	69.5	49.7	43.0	42.3	37.7	32.6	26.7	19.0
1991 .....	92.3	92.4	87.1	65.0	53.3	31.8	41.9	35.8	29.6	20.6	14.6	6.7
2000 .....	98.3	98.0	93.4	75.1	61.6	(NA)	54.5	49.6	40.6	28.5	23.2	(NA)
<b>Pakistan</b>												
1972 .....	96.0	96.3	94.3	90.8	85.6	65.7	8.6	7.7	9.5	7.3	8.6	8.9
1981 .....	89.5	93.9	92.0	90.4	(NA)	<sup>8</sup> 75.7	3.3	2.7	3.1	2.4	(NA)	<sup>8</sup> 2.3
1994 .....	97.5	97.2	96.5	91.5	78.8	52.7	14.1	15.6	13.9	15.3	11.8	7.4
2006 .....	97.3	97.6	95.8	90.7	77.5	49.3	23.1	26.5	22.5	22.8	19.1	11.5
<b>Philippines</b>												
1970 .....	89.5	89.7	87.1	85.8	79.3	56.5	37.1	38.7	36.5	33.4	28.6	17.7
1978 .....	97.6	<sup>11</sup> 95.9	(NA)	<sup>14</sup> 89.1	(NA)	60.6	48.1	<sup>11</sup> 47.5	(NA)	<sup>14</sup> 40.9	(NA)	23.1
1989 .....	97.9	<sup>11</sup> 97.4	(NA)	<sup>14</sup> 88.9	(NA)	59.0	53.3	<sup>11</sup> 58.2	(NA)	<sup>14</sup> 50.7	(NA)	29.4
1999 .....	97.4	<sup>11</sup> 96.8	(NA)	<sup>14</sup> 88.1	(NA)	54.5	57.2	<sup>11</sup> 64.0	(NA)	<sup>14</sup> 55.8	(NA)	29.8
2006 .....	95.5	<sup>11</sup> 93.8	(NA)	<sup>14</sup> 80.6	(NA)	50.6	55.9	<sup>11</sup> 63.3	(NA)	<sup>14</sup> 54.1	(NA)	28.7

See footnotes at end of table.

Table B-8.  
**Labor Force Participation Rates by Sex, Age, and Country: Selected Years 1969 to 2006—Con.**

(In percent)

Country and year	Male						Female					
	25 to 44 years	45 to 49 years	50 to 54 years	55 to 59 years	60 to 64 years	65 years and over	25 to 44 years	45 to 49 years	50 to 54 years	55 to 59 years	60 to 64 years	65 years and over
<b>Asia—Con.</b>												
<b>Singapore</b>												
1970 .....	98.2	96.2	88.1	73.9	55.6	31.9	23.2	17.5	17.5	16.2	13.4	6.5
1980 .....	97.7	95.7	89.6	70.7	52.5	28.6	45.9	26.5	20.4	14.5	11.3	6.4
1989 .....	97.9	96.1	89.2	66.6	48.2	20.7	60.6	41.3	30.7	19.4	11.0	5.0
2000 .....	97.6	96.3	91.3	74.4	49.6	18.5	71.4	57.4	46.7	29.6	15.3	4.1
2006 .....	97.1	96.5	93.3	81.9	62.5	22.0	74.5	66.2	59.5	44.6	26.2	8.3
<b>South Korea</b>												
1970 .....	93.0	95.2	91.9	85.4	67.9	35.1	38.8	48.5	45.2	39.1	26.9	10.6
1975 .....	97.7	96.8	93.7	85.6	68.3	34.4	45.9	59.8	57.1	50.9	33.6	12.0
1989 .....	94.8	93.6	89.7	82.4	65.6	39.0	51.3	63.5	60.4	52.7	41.6	18.1
1999 .....	92.6	93.0	89.9	81.0	65.5	40.2	55.6	62.8	55.4	51.2	46.3	21.4
2006 .....	90.5	93.1	89.7	79.9	68.5	42.0	61.4	64.4	58.5	49.7	43.8	22.7
<b>Sri Lanka</b>												
1971 .....	89.0	92.0	89.1	77.9	63.4	40.3	27.3	26.2	21.5	14.6	8.4	3.6
1981 .....	93.1	92.3	87.4	74.3	56.6	35.7	32.5	25.2	19.3	13.2	6.9	3.8
1996 .....	95.6	91.9	91.8	73.0	(NA)	<sup>8</sup> 38.6	46.0	39.0	32.3	27.2	(NA)	<sup>8</sup> 7.8
2000 .....	95.2	95.6	88.8	76.8	(NA)	<sup>8</sup> 40.6	48.9	47.1	36.4	31.6	(NA)	<sup>8</sup> 10.2
<b>Thailand</b>												
1970 .....	96.2	95.9	93.5	89.3	74.6	44.6	79.3	79.6	73.8	65.9	47.5	21.2
1980 .....	94.2	93.7	90.7	84.4	67.8	39.3	74.1	73.5	68.6	59.1	43.1	19.0
1994 .....	<sup>12</sup> 97.4	<sup>13</sup> 97.5	(NA)	<sup>7</sup> 92.8	(NA)	<sup>8</sup> 47.2	<sup>12</sup> 78.0	<sup>13</sup> 76.7	(NA)	<sup>7</sup> 63.8	(NA)	<sup>8</sup> 23.5
2006 .....	<sup>12</sup> 95.8	<sup>13</sup> 96.7	(NA)	<sup>7</sup> 92.0	(NA)	<sup>8</sup> 52.2	<sup>12</sup> 83.6	<sup>13</sup> 83.6	(NA)	<sup>7</sup> 71.3	(NA)	<sup>8</sup> 27.3
<b>Turkey</b>												
1970 .....	94.5	94.9	91.9	88.0	83.0	67.8	51.8	52.9	53.6	50.0	47.6	35.1
1980 .....	95.8	91.1	84.9	76.8	67.4	43.9	43.3	48.3	46.1	42.4	36.3	20.8
1988 .....	97.8	89.2	82.7	71.5	59.2	33.8	37.7	36.3	36.4	29.4	20.9	10.9
1996 .....	97.3	83.0	71.0	60.3	54.0	33.6	32.7	29.7	29.3	30.4	23.4	13.3
2006 .....	93.2	82.0	65.4	51.3	39.8	22.0	30.8	24.8	21.8	18.5	14.5	6.6
<b>Latin America/Caribbean</b>												
<b>Argentina</b>												
1970 .....	97.8	95.8	91.7	80.4	57.2	29.1	31.3	25.2	22.1	16.2	10.3	4.7
1980 .....	94.9	92.4	87.6	77.6	51.9	17.9	35.3	30.2	25.4	17.6	9.8	3.2
1989 .....	97.1	95.0	90.6	79.4	56.1	23.5	38.9	31.9	27.8	19.8	11.2	3.7
1995 .....	94.6	93.6	90.0	82.8	63.2	27.6	55.5	53.2	46.6	35.4	22.6	8.9
2006 .....	95.1	95.3	92.6	87.3	76.8	28.3	68.3	67.2	62.1	55.6	38.7	10.7
<b>Brazil</b>												
1970 .....	95.1	92.3	87.7	82.6	73.5	49.8	21.3	18.6	16.5	14.2	11.4	6.3
1980 .....	96.0	91.5	85.7	77.9	67.0	32.4	34.3	28.1	23.5	18.6	12.6	4.8
1990 .....	<sup>12</sup> 96.6	<sup>13</sup> 94.5	<sup>7</sup> 82.3	(NA)	(NA)	<sup>8</sup> 46.0	<sup>12</sup> 54.0	<sup>13</sup> 49.5	<sup>7</sup> 34.5	(NA)	(NA)	<sup>8</sup> 11.5
2000 .....	92.7	88.2	<sup>7</sup> 76.8	(NA)	<sup>17</sup> 49.8	<sup>18</sup> 20.1	62.7	54.6	<sup>7</sup> 39.0	(NA)	<sup>17</sup> 15.5	<sup>18</sup> 4.6
2004 .....	94.7	92.1	85.8	77.6	64.9	35.1	71.6	65.4	57.3	45.5	30.9	14.1
<b>Chile</b>												
1970 .....	97.3	94.0	88.5	82.6	72.1	42.4	26.0	21.4	19.3	15.5	11.1	6.5
1982 .....	94.8	90.1	82.8	72.8	61.5	25.5	32.2	26.0	21.9	16.2	10.1	4.5
1992 .....	95.9	94.9	92.4	82.1	66.6	31.5	45.2	39.7	39.3	28.2	19.2	6.3
1999 .....	95.6	95.9	91.3	83.4	69.2	27.4	50.1	47.1	42.9	32.4	21.0	6.5
2006 .....	93.9	95.3	91.4	86.1	73.2	26.9	55.6	51.9	48.4	40.1	25.3	7.7
<b>Colombia</b>												
1973 .....	92.8	91.1	87.1	81.6	72.9	49.6	25.3	19.1	17.1	14.8	12.4	8.1
1985 .....	<sup>5</sup> 91.1	(NA)	<sup>7</sup> 86.0	(NA)	(NA)	<sup>8</sup> 58.4	<sup>5</sup> 44.0	(NA)	<sup>7</sup> 31.4	(NA)	(NA)	<sup>8</sup> 16.7
1999 .....	<sup>19</sup> 92.4	<sup>13</sup> 96.0	<sup>7</sup> 88.2	(NA)	<sup>17</sup> 55.4	<sup>18</sup> 25.2	<sup>19</sup> 74.8	<sup>13</sup> 69.1	<sup>7</sup> 43.7	(NA)	<sup>17</sup> 19.3	<sup>18</sup> 5.4

See footnotes at end of table.

Table B-8.  
**Labor Force Participation Rates by Sex, Age, and Country: Selected Years 1969 to 2006—Con.**

(In percent)

Country and year	Male						Female					
	25 to 44 years	45 to 49 years	50 to 54 years	55 to 59 years	60 to 64 years	65 years and over	25 to 44 years	45 to 49 years	50 to 54 years	55 to 59 years	60 to 64 years	65 years and over
<b>Latin America/Caribbean—Con.</b>												
<b>Costa Rica</b>												
1973 .....	97.9	97.9	96.4	94.3	86.0	57.1	23.6	16.8	13.5	10.7	7.8	3.9
1984 .....	93.8	92.3	88.7	83.0	69.6	38.9	29.5	20.9	15.5	11.6	6.9	3.1
1996 .....	<sup>12</sup> 95.9	<sup>13</sup> 94.4	<sup>7</sup> 85.4	(NA)	<sup>17</sup> 51.4	<sup>18</sup> 21.1	<sup>12</sup> 43.3	<sup>13</sup> 44.2	<sup>7</sup> 22.2	(NA)	<sup>17</sup> 9.1	<sup>18</sup> 2.8
2006 .....	96.3	95.7	92.5	87.2	71.1	29.1	57.6	54.3	42.0	35.0	20.3	6.8
<b>Guatemala</b>												
1973 .....	95.6	95.3	94.0	92.4	87.7	69.8	14.3	13.6	12.9	12.0	10.2	7.1
1981 .....	93.2	93.2	91.7	90.3	85.8	66.9	14.9	12.2	11.6	10.1	9.0	6.5
1987 .....	98.3	98.0	95.2	95.0	88.5	63.3	31.2	31.3	26.6	23.7	20.6	13.7
1998–99 .....	97.3	97.7	95.1	94.1	87.2	71.4	51.4	56.4	46.9	45.1	41.0	28.8
2004 .....	94.7	91.4	93.8	92.5	92.2	66.7	52.0	53.2	44.6	39.7	30.3	23.7
<b>Jamaica</b>												
1975 .....	97.9	<sup>11</sup> 97.2	(NA)	<sup>14</sup> 90.9	(NA)	64.7	78.6	<sup>11</sup> 76.1	(NA)	<sup>14</sup> 56.5	(NA)	27.0
1988 .....	80.1	<sup>11</sup> 94.6	(NA)	<sup>14</sup> 90.5	(NA)	52.4	60.9	<sup>11</sup> 73.7	(NA)	<sup>14</sup> 65.4	(NA)	24.9
1998 .....	95.2	<sup>11</sup> 95.1	(NA)	<sup>14</sup> 81.6	(NA)	46.4	79.2	<sup>11</sup> 75.5	(NA)	<sup>14</sup> 53.5	(NA)	18.4
2004 .....	94.3	<sup>11</sup> 93.7	(NA)	<sup>14</sup> 81.8	(NA)	41.4	76.9	<sup>11</sup> 72.6	(NA)	<sup>14</sup> 50.1	(NA)	17.3
<b>Mexico</b>												
1970 .....	89.2	89.6	88.0	86.2	81.5	67.1	17.3	16.8	16.2	15.4	14.4	11.8
1980 .....	95.5	95.3	93.8	91.4	85.6	68.6	32.6	29.1	27.5	24.6	24.1	18.6
1988 .....	96.4	96.9	91.9	85.5	77.5	58.4	40.8	38.2	31.7	24.6	23.2	16.9
1996 .....	97.2	95.6	91.9	85.6	74.1	52.0	44.8	41.3	35.0	31.2	23.8	14.1
2006 .....	96.0	95.4	92.5	88.2	74.0	45.8	52.6	50.4	44.0	35.3	28.5	14.7
<b>Peru</b>												
1972 .....	96.3	97.1	95.5	92.8	83.9	61.5	22.3	19.5	17.9	16.1	13.4	8.5
1981 .....	96.3	98.7	97.3	94.9	88.5	63.2	30.3	26.9	26.0	23.6	23.4	12.5
1989 .....	95.2	94.4	88.3	83.2	75.0	34.6	60.3	54.4	42.9	38.8	23.9	12.0
1999 .....	95.0	96.8	93.3	85.6	72.5	41.1	69.9	68.1	57.2	47.5	38.2	19.2
2006 .....	95.3	98.7	94.6	87.0	65.5	28.8	70.1	67.0	56.2	39.2	34.9	15.3
<b>Uruguay</b>												
1975 .....	96.9	95.2	90.5	81.2	58.9	20.9	40.5	35.3	29.6	21.7	12.2	3.6
1985 .....	96.5	94.3	89.4	80.0	51.8	16.2	51.7	46.4	37.5	25.3	13.3	3.6
1995 .....	97.4	96.4	94.3	89.3	59.3	19.4	73.0	64.6	59.5	41.0	23.9	6.7
2006 .....	99.7	97.9	96.4	91.2	68.8	19.7	75.4	75.9	69.4	58.7	39.0	8.4

(NA) Not available.

<sup>1</sup> Refers to ages 65 to 66 years.

<sup>2</sup> Data prior to 1996 refer to the former West Germany.

<sup>3</sup> Refers to ages 65 to 74 years.

<sup>4</sup> Data for 2000 and 2006 are averages of reported quarterly rates.

<sup>5</sup> Refers to ages 25 to 49 years.

<sup>6</sup> Refers to ages 50 to 64 years.

<sup>7</sup> Refers to ages 50 to 59 years.

<sup>8</sup> Refers to ages 60 years and over.

<sup>9</sup> Data prior to 1991 refer to the former Czechoslovakia.

<sup>10</sup> Refers to ages 65 to 70 years.

<sup>11</sup> Refers to ages 45 to 54 years.

<sup>12</sup> Refers to ages 25 to 39 years.

<sup>13</sup> Refers to ages 40 to 49 years.

<sup>14</sup> Refers to ages 55 to 64 years.

<sup>15</sup> Refers to ages 45 to 59 years.

<sup>16</sup> Refers to ages 25 to 54 years.

<sup>17</sup> Refers to ages 60 to 69 years.

<sup>18</sup> Refers to ages 70 years and over.

<sup>19</sup> Refers to ages 20 to 39 years.

Note: For some countries in this table, data are derived from labor force surveys as well as population censuses. Labor force surveys are more focused on economic activity than are general census enumerations and, therefore, may yield more comprehensive information on various aspects of economic activity. The user should recognize that temporal differences in labor force participation rates within a country may, in part, reflect different modes of data collection.

Sources: U.S. Census Bureau, Population Division data files; International Labour Organization, various issues of the *Yearbook of Labour Statistics*; and the International Labour Organization electronic database accessible at <<http://laborsta.ilo.org/>>.

## Sources and Limitations of the Data

This report includes data compiled by the International Programs Center (IPC) in the Population Division of the U.S. Census Bureau from publications and electronic files of national statistical offices, several agencies of the United Nations, and other international organizations (e.g., the Organisation for Economic Co-Operation and Development and the European Union). It also includes crossnational information from sources such as the Global Burden of Disease Project <[www.who.int/topics/global\\_burden\\_of\\_disease](http://www.who.int/topics/global_burden_of_disease)>; the Survey of Health, Ageing and Retirement in Europe <[www.share-project.org](http://www.share-project.org)>; and other university-based research projects.

The majority of statistics, including the demographic projections in Appendix B, are contained in an International Data Base (IDB), maintained and updated by the IPC. Since 1985, IDB data have been available in an evolving variety of formats, including printed hard copy, mainframe computer tape, and PC diskettes. The current IDB is maintained on and made accessible via the Internet at <[www.census.gov/ipc/www/idb/](http://www.census.gov/ipc/www/idb/)>.

With the initial and ongoing support from the Behavioral and Social Research Program of the U.S. National Institute on Aging, the Census Bureau has undertaken a systematic effort to locate and compile data on older populations for a subset of IDB countries and subject matter (e.g., marital status and labor force participation). The intent of this effort is

to make available to researchers a relatively consistent, documented set of data that can be used to analyze and anticipate international concerns related to the aging of the world's population. It should be noted, though, that while IDB data are statistical estimates based on censuses and surveys conducted by national statistical offices and international organizations, standard errors are not provided in the IDB for the data from those censuses and surveys. Accordingly, no conclusions can be reached concerning the statistical significance of differences between population estimates presented in this report. Selected data from the IDB appear in tables in Appendix B. Further information about the Census Bureau's IDB and related statistics may be obtained by contacting:

Chief, International Programs  
Center  
Population Division  
U.S. Census Bureau  
Washington, DC 20233

### BASIC DEMOGRAPHIC DATA

Estimated and projected population distributions by age and sex are taken from IPC data files except where noted. Many of the countries covered in this report have produced their own national population projections, and different statistical agencies generate country-specific sets of projections for all but the least populous countries. National, Census Bureau, United Nations, and other projection series are in general agreement over the next 20 to 30 years. This is especially true with regard to older populations, since people

who will join the ranks of older population groups in 2040 have been born already. Because tomorrow's older people have survived the risks of infant and childhood mortality, their continued survival is subject to adult mortality rates that can be estimated with a relatively high degree of confidence until very old ages (though estimates in some countries may be confounded by the changing impact of HIV/AIDS). Because the effects of migration on projected cohorts are minimal in most cases, projections of the absolute numbers of older people may be considered fairly reliable.

Of less certainty are projected population proportions and related measures, such as youth support ratios. The size of youth cohorts is often the most important factor in determining overall population aging. Population projections for developing countries usually assume a future decline in fertility rates that will eventually result in older population age structures. The pace and level of fertility reduction is debatable, however, and as a result, older proportions in population projections will vary to the extent that actual fertility change deviates from its assumed trajectory. Projections for developed countries are less sensitive to such uncertainty because of the extent of fertility decline that has already occurred. With fertility now well below replacement level in most developed countries, the issue for projections is whether to assume a future rebound in fertility. In some developed countries, changes in migration levels could

have a larger future impact than birth rates on overall age structure.

Most of the variation in projections of the size of older populations appears to result from uncertainty about mortality at the oldest ages. Projections require assumptions about future trends, and most past projections have not anticipated the continued declines in mortality rates at older ages that have occurred in developed countries. Projections made in 1984 (Torrey, Kinsella, and Taueber, 1987) implied that the Japanese population aged 80 and over would constitute slightly less than 5 percent of the total Japanese population by the year 2025. In the years after 1984, however, the decline in fertility and the increase in life expectancy (both at birth and at older ages) have been sharper than expected. Hence, revised projections to 2025 imply a somewhat smaller total population, and the oldest-old share of the total is now projected to be 10 percent by the year 2025. For the most part, best-guess demographic forecasts have tended to be “conservative” with regard to mortality improvement, meaning that future numbers of older people may be understated. In terms of social service planning for future cohorts of the oldest old, the example of Japan underscores the magnitude of potential “error” with which planners may be confronted. This suggests a need for more analytical attention to the assumptions and outcomes of population projections about the number of older people. Toward this end, organizational units including the United Nations’ Population Division, Eurostat, and the Census Bureau’s Population Division, in conjunction with members of academia and sponsors, such as the U.S. National Institute on Aging, have pooled their

combined expertise to refine and improve projection procedures. For a detailed critique and discussion of such procedures, see National Research Council (2000).

Census Bureau population projections for a given country incorporate several components. The initial population age/sex structure usually is based on a national census distribution, with or without adjustment, as determined by Census Bureau analysts. Analysts then derive—either directly using reported data or indirectly using demographic techniques—empirical age-sex-specific mortality, fertility, and international migration rates, considering the range of available data (e.g., from demographic and other surveys, vital registration systems, and other administrative statistics). These benchmark estimates form the basis for projected changes in the population age/sex structure. In countries where reliable, nationally representative data for one or more of these variables are lacking, rates from demographic models or culturally similar neighboring countries may be employed. Future levels of fertility, mortality, and migration are incorporated based on observed country-specific trends and the accumulated experience of other nations at different stages of demographic and socioeconomic development.

With regard to the age structure of older populations, potential sources of error usually have been assumed to be minor in most (but not all) countries. To date, demographers have devoted much more attention to analyzing age inaccuracies at younger rather than older ages. However, inaccuracies at older ages do occur. An individual’s age is often undocumented in some societies and subcultures, and knowledge of exact age may not

be an important concern. Hence, reported ages of older respondents tend to heap on certain round numbers (60, 65, 70, etc.). Many of these inaccuracies can be detected and statistically adjusted and are commonly accounted for in population projections.

Available evidence suggests that the older population as a whole is not undercounted in censuses more than other age groups. In most countries, older people are less apt than those in younger age groups to be geographically mobile and thus, in theory, should be easier to enumerate. Within the older population, however, there are indications that women are missed more often than men. In some South Asian and African societies, national censuses routinely count more men than women in older age groups, in spite of the fact that the estimated life expectancy of women is and has been higher than that of men in practically all countries.

## **SOCIOECONOMIC CHARACTERISTICS**

Data on labor force participation, marital status, and other socioeconomic characteristics are primarily derived from published census and survey data of various countries as compiled by the Census Bureau. Although no techniques have been applied to evaluate the quality of these socioeconomic statistics, the Census Bureau attempts to resolve discrepancies in reported figures and compile information in standard formats within the structure of the IDB.

IDB data are not always comparable among countries for two main reasons: (1) complete statistics may not be available to allow manipulation of data into standard formats, and (2) concepts and definitions vary according to the

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specific needs of each country. For example, a country with only a few small urban centers may need a different definition of urban than does a highly industrialized country that is predominantly urban. Uneven progress has been made during the past half century to encourage disparate national statistical agencies to adhere to defined international standards of data collection and tabulation. As a result, some concepts (e.g., literacy) are more internationally comparable than others (e.g., labor force participation). To the extent possible, the

Census Bureau has accounted for statistical and conceptual differences when compiling IDB country files. Remaining deviations from standard formats and other data anomalies are documented in the annotation that forms part of the IDB files. Where applicable, national definitions of major concepts such as “urban” and “economically active” are included in IDB files to allow the user to recognize differences among countries.

As population aging has assumed greater importance and received greater recognition over time,

international agencies have produced a growing amount of data on older populations. This is especially true in the areas of health, economic activity, income, and retirement. As a result, this report draws substantially on crossnational data and comparisons produced by a variety of organizations and research consortia whose subject-matter expertise in these areas is invaluable to a better understanding of an aging world.



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## APPENDIX D.

# References

Many of the data in this report are taken or derived from hundreds of sources not generally included in the following reference list. These unnamed sources consist mainly of primary census and survey volumes and electronic tabulations from individual nations, as well as periodic issues and updates of international compendia, such as the International Labour Organization LABORSTA Statistics Database and the United Nations *Demographic Yearbook*.

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