

An Aging World: 2001

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By Kevin Kinsella
and Victoria A. Velkoff



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20 Questions About Global Aging

(to test your knowledge of global population aging at the turn of the century)

Answers appear on next page.

- True or false?* In the year 2000, children under the age of 15 still outnumbered elderly people (aged 65 and over) in almost all nations of the world.
- The world's elderly population is increasing by approximately how many people each month?
 - 50,000
 - 300,000
 - 500,000
 - 800,000
- Which of the world's developing regions has the highest aggregate percent elderly?
 - Africa
 - Latin America
 - The Caribbean
 - Asia (excluding Japan)
- China has the world's largest total population (more than 1.2 billion people). Which country has the world's largest elderly (65+) population?
 - Japan
 - Germany
 - China
 - Nigeria
- True or false?* More than half of the world's elderly today live in the industrialized nations of Europe, North America, and Japan.
- Of the world's major countries, which had the highest percentage of elderly people in the year 2000?
 - Sweden
 - Turkey
 - Italy
 - France
- 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.
- True or false?* The number of the world's "oldest old" (people aged 80 and over) is growing more rapidly than that of the elderly as a whole.
- More than one-third of the world's oldest old live in which three countries?
 - Germany, the United States, and the United Kingdom
 - India, China, and the United States
 - Japan, China, and Brazil
 - Russia, India, and Indonesia
- Japan has the highest life expectancy at birth among the major countries of the world. How many years can the average Japanese baby born in 2000 expect to live?
 - 70 years
 - 75 years
 - 81 years
 - 85 years
- True or false?* Today in some countries life expectancy at birth is less than 40 years.
- What are the leading killers of elderly women in Europe and North America?
 - Cancers
 - Respiratory diseases
 - Circulatory diseases
 - Accidents
- True or false?* Elderly women outnumber elderly men in all developing countries.
- There are more older widows than widowers in virtually all countries because:
 - Women live longer than men
 - Women typically marry men older than themselves
 - Men are more likely than women to remarry after divorce or the death of a spouse
 - All of the above
- In developed countries, recent declines in labor force participation rates of older (55 and over) workers are due almost entirely to changing work patterns of
 - Men
 - Women
 - Men and women
- What proportion of the world's countries have a public old-age security program?
 - All
 - Three-fourths
 - One-half
 - One-fourth
- Approximately what percent of the private sector labor force in the United States is covered by a private pension plan (as opposed to, or in addition to, public Social Security)?
 - 10 percent
 - 25 percent
 - 33 percent
 - 60 percent
- In which country are elderly people least likely to live alone?
 - The Philippines
 - Hungary
 - Canada
 - Denmark
- True or false?* In developing countries, older men are more likely than older women to be illiterate.
- True or false?* In most nations, large cities have younger populations (i.e., a lower percent elderly) than the country as a whole.

Answers

1. **True.** Although the world's population is aging, children still outnumber the elderly in all major nations except six: Bulgaria, Germany, Greece, Italy, Japan, and Spain.
2. **d.** The estimated change in the total size of the world's elderly population between July 1999 and July 2000 was more than 9.5 million people, an average of 795,000 each month.
3. **c.** The Caribbean, with 7.2 percent of all people aged 65 or older. Corresponding figures for other regions are: Asia (excluding Japan), 5.5 percent; Latin America, 5.3 percent; and Africa, 3.1 percent.
4. **c.** China also has the largest elderly population, numbering nearly 88 million in 2000.
5. **False.** Although industrialized nations have higher percentages of elderly people than do most developing countries, 59 percent of the world's elderly now live in the developing countries of Africa, Asia, Latin America, the Caribbean, and Oceania.
6. **c.** Italy, with 18.1 percent of all people aged 65 or over. Monaco, a small principality of about 32,000 people located on the Mediterranean, has more than 22 percent of its residents aged 65 and over.
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 percent of population aged 65 and over in the year 2050 is projected to be slightly above 20 percent (compared with about 13 percent today).
8. **True.** The oldest old are the fastest-growing component of many national populations. The world's growth rate for the 80+ population from 1999 to 2000 was 3.5 percent, while that of the world's elderly (65+) population as a whole was 2.3 percent (compared with 1.3 percent for the total (all ages) population).
9. **b.** India has roughly 6.2 million people aged 80 and over, China has 11.5 million, and the United States 9.2 million. Taken together, these people constitute nearly 38 percent of the world's oldest old.
10. **c.** 81 years, up from about 52 in 1947.
11. **True.** In some African countries (e.g., Malawi, Swaziland, Zambia, and Zimbabwe) where the HIV/AIDS epidemic is particularly devastating, average life expectancy at birth may be as much as 25 years lower than it otherwise would be in the absence of HIV/AIDS.
12. **b.** Circulatory diseases (especially heart disease and stroke) typically are the leading cause of death as reported by the World Health Organization. In Canada in 1995, for example, 44 percent of all deaths occurring to women at age 65 or above were attributed to circulatory disease. The percentage was virtually the same for elderly men.
13. **False.** Although there are more elderly women than elderly men in the vast majority of the world's countries, there are exceptions such as India, Iran, and Bangladesh.
14. **d.** All of the above.
15. **a.** From the late 1960s until very recently, labor force participation rates of older men in developed countries were declining virtually everywhere, whereas those for women were often holding steady or increasing. But because older men work in much greater numbers than do older women, increases in female participation were more than offset by falling male participation.
16. **b.** Of the 227 countries/areas of the world with populations of at least 5,000, 167 (74 percent) reported having some form of an old age/disability/survivors program circa 1999.
17. **d.** The share of the private sector U.S. labor force covered by private pension plans was about 60 percent in the mid-1990s. However, not all employees who are covered by such plans actually participate in them.
18. **a.** The Philippines. The percent of elderly 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. In China in 1990, for example, only 11 percent of women aged 60 and over could read and write, compared with half of men aged 60 and over.
20. **We do not know.** Data for selected cities/countries are presented in Chapter 5. Some literature from developed countries suggests that the statement is false; evidence from certain developing countries suggests that it is true. Both the Census Bureau's International Programs Center and the National Institute on Aging's Behavioral and Social Research Program would be most interested in empirical input from interested parties. Understanding global aging is a dialectical process.

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CHAPTER 1.

Introduction

The United Nations designated 1999 as "The Year of the Older Person," thereby recognizing and reaffirming what demographers and many others have known for decades: our global population is aging, and aging at an unprecedented rate. Fertility decline and urbanization arguably have been 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 begin the twenty-first century, population aging is poised to emerge as a preeminent worldwide phenomenon. The confluence of lowered fertility and improved health and longevity has generated growing numbers and proportions of older population throughout most of the world. As education and income levels rise, increasing numbers of individuals reach "old age" with markedly different life expectancies and personal expectations than their forebears.

Population aging represents, in one sense, a human success story; societies now have the luxury of aging. However, the steady, sustained growth of elderly¹ populations also

¹ There is a growing awareness that the term "elderly" is an inadequate generalization that conceals the diversity of a broad age group, spanning more than 40 years of life. For cross-national comparative purposes, however, some chronological demarcation of age categories is required. This report uses the following terms for component age groups: the elderly (65 and over); the young old (65 to 74 years); and the oldest old (80 years and over). In some contexts (e.g., older people in the labor force), it may be most useful or necessary (due to data restrictions) to refer to the "older population," those 55 years and older. The term "frail elderly" refers to people 65 years or older with significant physical and cognitive health problems. This term is used to emphasize the fact that a majority of the elderly, especially the young old, do not have serious health problems.

poses myriad challenges to policy-makers in many societies. After the year 2010, the numbers and proportions of elderly, especially the oldest old, will rise rapidly in most developed and many developing countries.² The projected increase is primarily the result of high fertility after World War II. It is secondarily, but increasingly, the result of reduced death rates at all ages; in most nations of the world, there have been major reductions in the prevalence of infectious and parasitic diseases, declines in infant and maternal mortality, and improved nutrition during the 1900s. One focus of this report is a look at the numbers, proportions, and growth rates (past, current, and projected) of the elderly population.

Most people, for good reason, associate the growth of elderly populations with the developed, industrialized countries of Europe and North America. Most developed nations are in fact the demographically oldest in the world today, and some may have more grandparents than 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

² 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. While these categories commonly are used for comparative purposes, it is increasingly evident that they no longer accurately reflect developmental differences between nations.

of the total population in each category). The developing world, by contrast, still had a high proportion of children (35 percent of all people under age 15) and a relatively low proportion of older people (10 percent aged 55 and over).

What is less widely appreciated is that absolute numbers of elderly in developing nations often are large and everywhere are increasing. Well over half of the world's elderly (people aged 65 and over) now live in developing nations (59 percent, or 249 million people, in 2000). By 2030, this proportion is projected to increase to 71 percent (686 million).³ Many developing countries have had or are now experiencing a significant 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. The elderly will be an ever-larger proportion of each nation's total

³ Throughout this report, projections of population size and composition come from the International Programs Center, Population Division, U.S. Census Bureau, unless otherwise indicated. As discussed further in Appendix B, these projections are based on empirical 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.

Projections, strictly speaking, are neither forecasts nor predictions. Projections are "correct" in the sense that they are actual results of mathematical calculations based on specified assumptions. Forecasts are projections that analysts judge to be the most probable end results. There can be alternative projections, but it would be contradictory to make alternative forecasts. It may, however, be appropriate to develop numerical ranges for forecast values. Predictions have no formal statistical meaning; they are related more to forecasts than to projections.

population. Elderly populations also have grown because of worldwide improvements in health services, educational status, and economic development. The characteristics of the elderly are likely to be increasingly heterogeneous within nations. Thus, a second focus of *An Aging World: 2001* is to summarize socioeconomic statistics for both developed and developing nations. This report shows such data for 52 nations when available and reasonably comparable. In 2000, these 52 nations (listed in Appendix A, Table 1) contained 77 percent of the world's total population, and are referred to as "study countries" at various points in the text.⁴

This report focuses primarily on people aged 65 years old and over. 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: 2001* 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 elderly population in many nations are those aged 80 and over, referred to as the oldest old. Rapidly expanding numbers of very old people represent a social phenomenon without historical precedent, and one that is bound to alter previously held stereotypes of older people. 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: 2001 is the seventh major cross-national report in a Census Bureau series on the world's elderly/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 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); 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), Population Division, U.S. Census Bureau. Differences among reports in projected data may reflect either a change in the source of the projections or, more importantly, revised demographic insights 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 tabular statistics provided in Appendix A represent only a small portion of the total IDB files. 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/idbnew.html

Appendix B 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 has provided international recommendations for the standardization of concepts and definitions of data collected in censuses and surveys. Nevertheless, there are still wide discrepancies in data collection and tabulation practices because of legitimate differences in the resources and information needs among countries. As a result, any attempt to compile standard data across countries requires consideration of whether and how the reported data should be analyzed to achieve comparability.

The demographic data in this report have been judged by Census Bureau analysts to be as representative as possible 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 those 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

⁴ In some parts of the text, data from additional countries have been included.

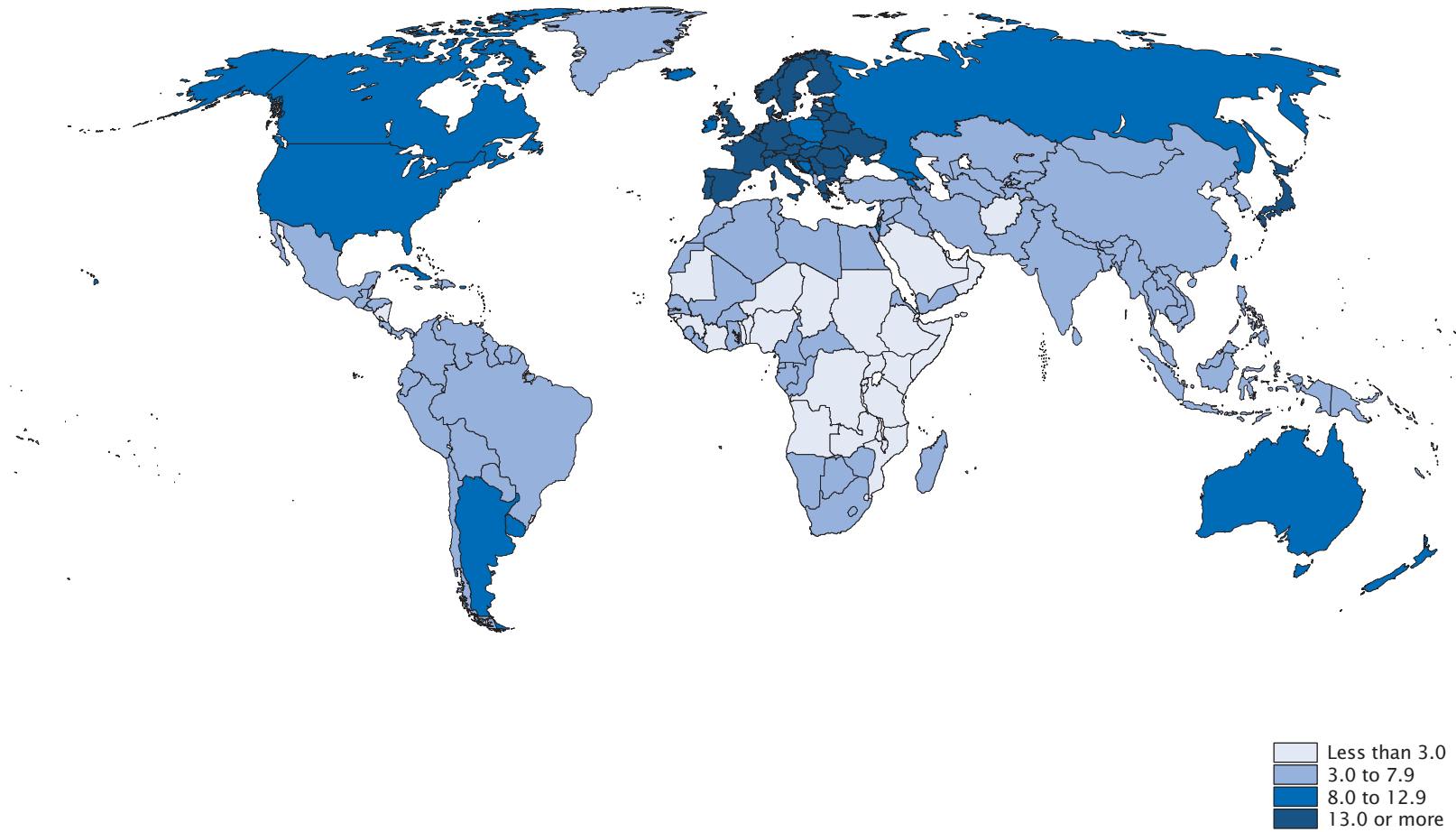
data, analysts have attempted to resolve discrepancies in reported figures and to eliminate international inconsistencies; data with obvious incongruities are not included.

We are all part of an increasingly interdependent and aging world (Figure 1-1). Current growth of elderly 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 their elder years after 2010, there will be a significant jump by 2030 in the

proportion of the world's population that is elderly (Figure 1-2). The coming growth, especially of the oldest old, will be stunning. As their numbers grow, there is a heightened 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 the elderly from interrelated perspectives including demographic, social, economic, medical, and

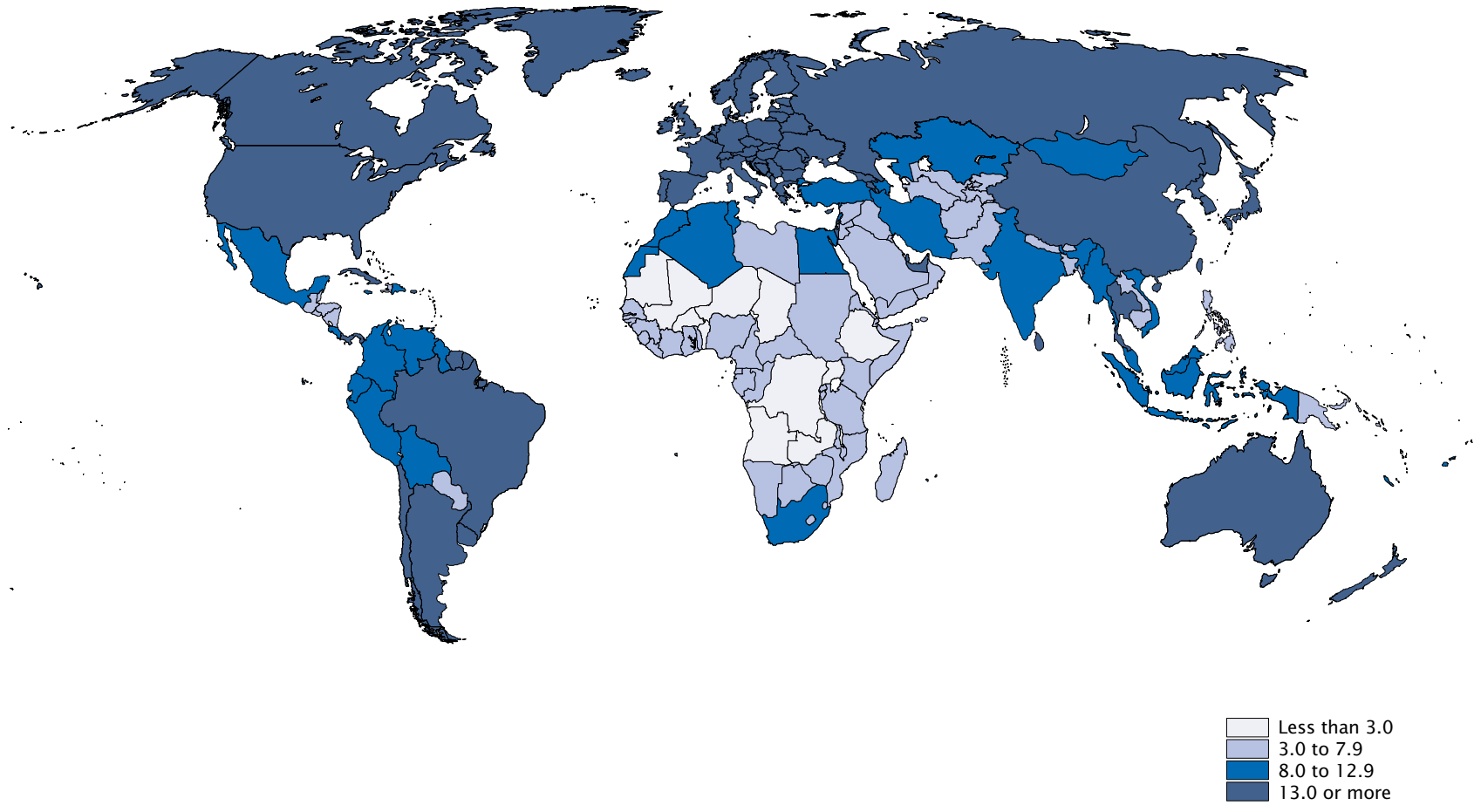
increasingly, biologic and genetic. The IDB and this report are an effort to contribute to a consistent, systematic, quantitative comparison of older populations in various countries. Information is the first step toward a better understanding of the effects of population aging within and across national boundaries. As individuals, as nations, and as an international community, we face the challenge of anticipating the changing needs and desires of an aging world in a new millennium.

Figure 1-1.
Percent Aged 65 and Over: 2000



Source: U.S. Census Bureau, 2000a.

Figure 1-2.
Percent Aged 65 and Over: 2030



Source: U.S. Census Bureau, 2000a.

The Demographics of 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 numbers of elderly residents. Developed nations have relatively high proportions of people aged 65 and over, but the most rapid increases in elderly population are in the developing world. Even in nations where the elderly percentage of total population remains small, absolute numbers may be rising steeply. Everywhere, the growth of elderly populations poses challenges to social institutions that must adapt to changing age structures.

WORLD'S ELDERLY POPULATION INCREASING 795,000 EACH MONTH

The world's elderly population has been growing for centuries. What is new is the rapid pace of aging. The global population aged 65 and over was estimated to be 420 million people as of midyear 2000, an increase of 9.5 million since midyear 1999. The net balance of the world's elderly population grew by more than 795,000 people each month during the year. Projections to the year 2010 suggest that the net monthly gain will then be on the order of 847,000 people. In 1990, 26 nations had elderly populations of at least 2 million, and by 2000, 31 countries had reached the 2-million mark. Projections to the year 2030 indicate that more than 60 countries will have 2 million or more people aged 65 and over (Figure 2-1).

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 elderly are not contingent upon fertility, because anyone who will be aged 65 or over in 2030 has already been born. When projecting the size and composition of the world's future elderly population, human mortality is the key demographic component. As discussed in the next chapter, current and future uncertainties about changing mortality may produce widely divergent projections of the size of tomorrow's elderly population.

ELDERLY POPULATION GROWING FASTEST IN DEVELOPING COUNTRIES

Population aging has become a well-publicized phenomenon in the industrialized nations of Europe and North America. What is not widely appreciated is the fact that developing countries are aging as well, often at a much faster rate than in the developed world. Seventy-seven percent of the world's net gain of elderly individuals from July 1999 to July 2000 — 615,000 people monthly — occurred in developing countries. Figure 2-2 shows the different patterns of growth in developed versus developing countries. Most notable in developed countries is the steep plunge in growth in the early 1980s. The slowing of the growth rate was the result of low birth rates that prevailed in many

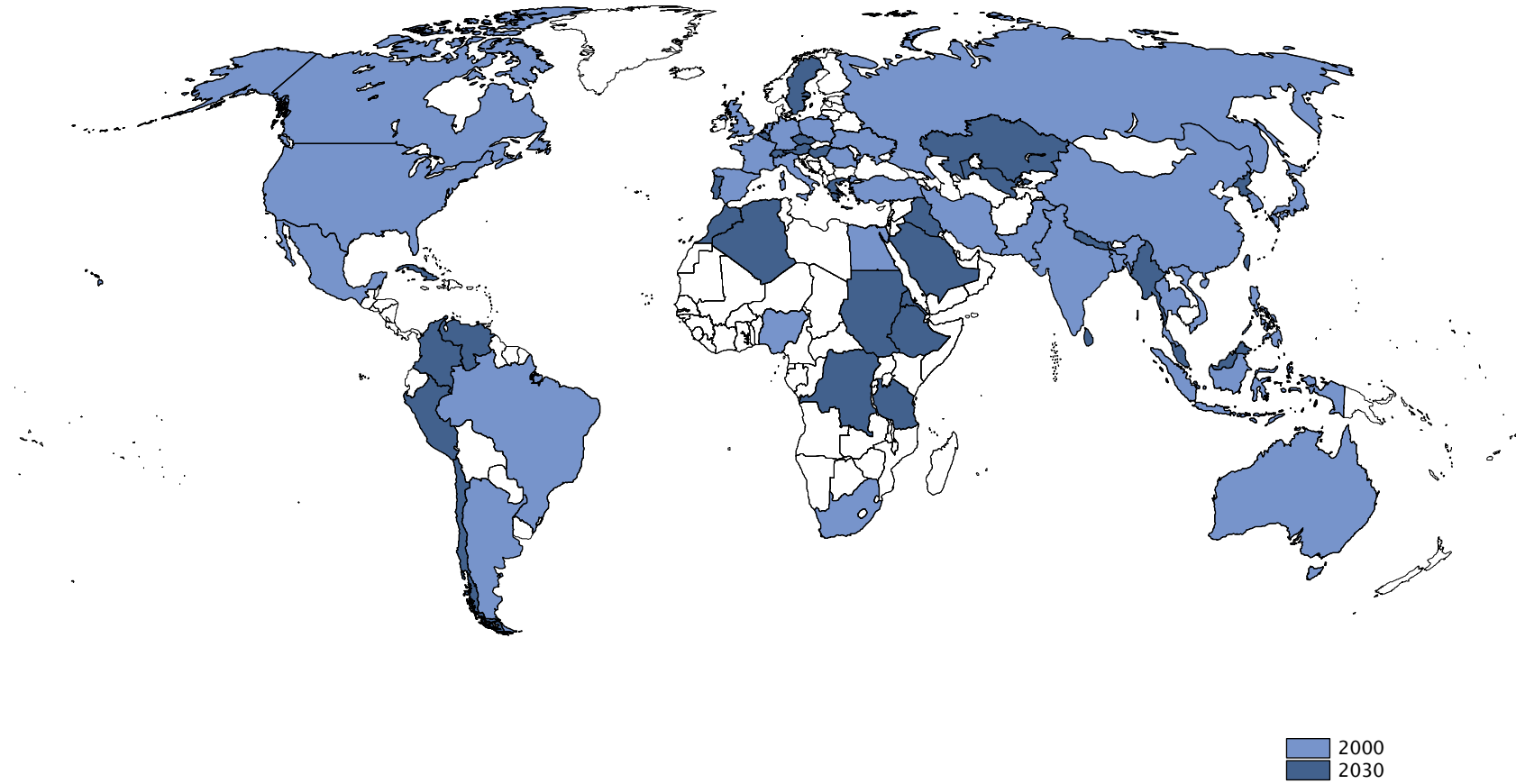
developed countries during and after World War I. A second, less severe, decline in the rate of growth began in the mid-1990s and will be most noticeable in the early 2000s. This decline corresponds to lowered fertility during the Great Depression and World War II. These drops in growth rate highlight the important influence that past fertility trends have on current and projected changes in the size of elderly populations.

The current aggregate growth rate of the elderly 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 — again related to lower wartime fertility — the elderly 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.

EUROPE STILL THE "OLDEST" WORLD REGION, AFRICA THE "YOUNGEST"

Europe has had the highest proportion of population aged 65 and over among major world regions for many decades and should remain the global leader well into the twenty-first century (Table 2-1). Until recently, this region also had the highest proportions of population in the most advanced age categories. But in 2000, the percentage of population aged 80 and over in

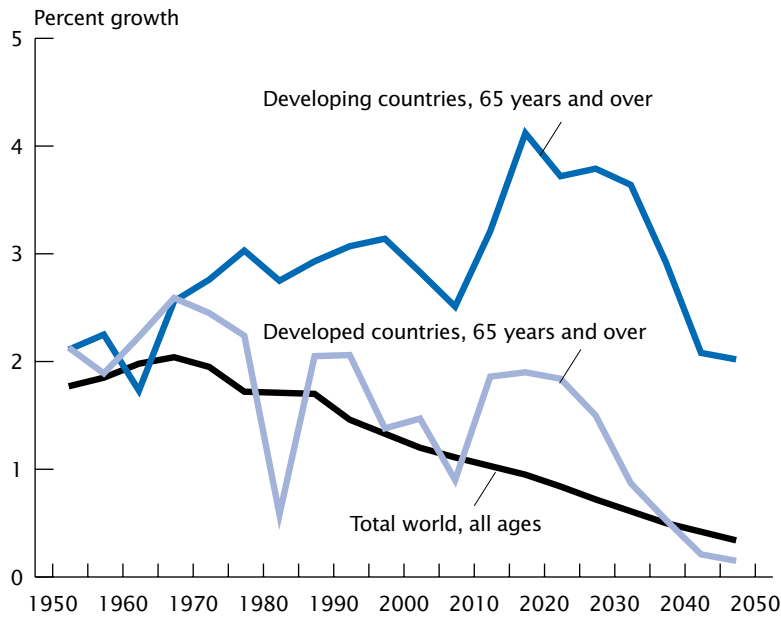
Figure 2-1.
Countries With 2 Million or More Elderly People: 2000 and 2030



Source: U.S. Census Bureau, 2000a.

Figure 2-2.

Average Annual Percent Growth of Elderly Population in Developed and Developing Countries



Source: United Nations, 1999.

North America was equal to that of Europe as a whole, probably as a result of small European birth cohorts around the time of World War I. By 2015, however, these percentages are again expected to be highest in Europe; in 2030, nearly 12 percent of all Europeans are projected to be over the age of 74 and 7 percent are projected to be over the age of 79.

North America and Oceania also have relatively high aggregate percentages of elderly, and these are projected to increase substantially between 2000 and 2030. Levels for 2000 in Asia and Latin America/Caribbean are expected to more than double by 2030, while aggregate proportions of elderly population in Sub-Saharan Africa will grow rather modestly as a result of continued high fertility in many nations.

Table 2-1. **Percent Elderly by Age: 2000 to 2030**

Region	Year	65 years and over	75 years and over	80 years and over
Europe.....	2000	15.5	6.6	3.3
	2015	18.7	8.8	5.2
	2030	24.3	11.8	7.1
North America	2000	12.6	6.0	3.3
	2015	14.9	6.4	3.9
	2030	20.3	9.4	5.4
Oceania.....	2000	10.2	4.4	2.3
	2015	12.4	5.2	3.1
	2030	16.3	7.5	4.4
Asia	2000	6.0	1.9	0.8
	2015	7.8	2.8	1.4
	2030	12.0	4.6	2.2
Latin America/Caribbean	2000	5.5	1.9	0.9
	2015	7.5	2.8	1.5
	2030	11.6	4.6	2.4
Near East/North Africa	2000	4.3	1.4	0.6
	2015	5.3	1.9	0.9
	2030	8.1	2.8	1.3
Sub-Saharan Africa.....	2000	2.9	0.8	0.3
	2015	3.2	1.0	0.4
	2030	3.7	1.3	0.6

Source: U.S. Census Bureau, 2000a.

Two important factors bear mention when considering aggregate elderly proportions of regional populations.

The first is that regional averages often hide great diversity. Bangladesh and Thailand may be close geographically, but these countries have divergent paths of expected population aging. Likewise, many Caribbean nations have high proportions of elderly population (the Caribbean is the "oldest" of all developing world regions) in relation to their Central American neighbors. Secondly and more importantly, percentages by themselves may not give a sense of population momentum. Although the change in percent elderly in Sub-Saharan Africa from 2000 to 2015 is barely perceptible, the size of the elderly population is expected to jump by 50 percent, from 19.3 million to 28.9 million people.

ITALY NOW THE WORLD'S "OLDEST" MAJOR COUNTRY

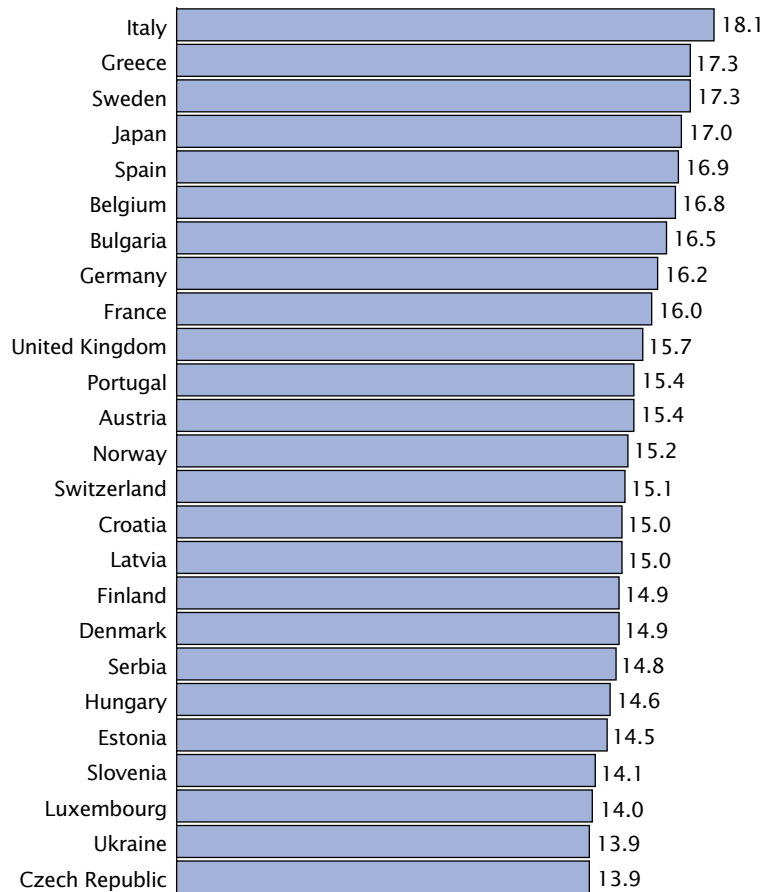
The percent of population aged 65 and over ranged from 12 to 16 percent in 2000 in most developed countries. For many years Sweden had the highest such proportion, but recently Italy became the demographically oldest of the world's major¹ nations. Over 18 percent of all Italians are aged 65 or over, with levels approaching or exceeding 17 percent in Greece, Sweden, Japan, Spain, and Belgium. With the exception of Japan, the world's 25 oldest countries are all in Europe (Figure 2-3). The United States, with an elderly proportion of less than 13 percent in 2000, is rather young by developed-country standards, and its proportion elderly will increase only slightly during the next decade. However, as the large birth cohorts of the baby boom (people born from 1946 through 1964) begin to reach age 65 after 2010, the percent elderly in the United States will rise markedly, likely reaching 20 percent by the year 2030. Still, this figure will be lower than in most countries of Western Europe.

¹ Some small areas/jurisdictions have very high proportions of elderly population. In 2000, three of the world's seven highest estimated percentages of elders were in the European principality of Monaco (more than 22 percent), Guernsey (17 percent) and the Isle of Man (more than 17 percent).

Figure 2-3.

The World's 25 Oldest Countries: 2000

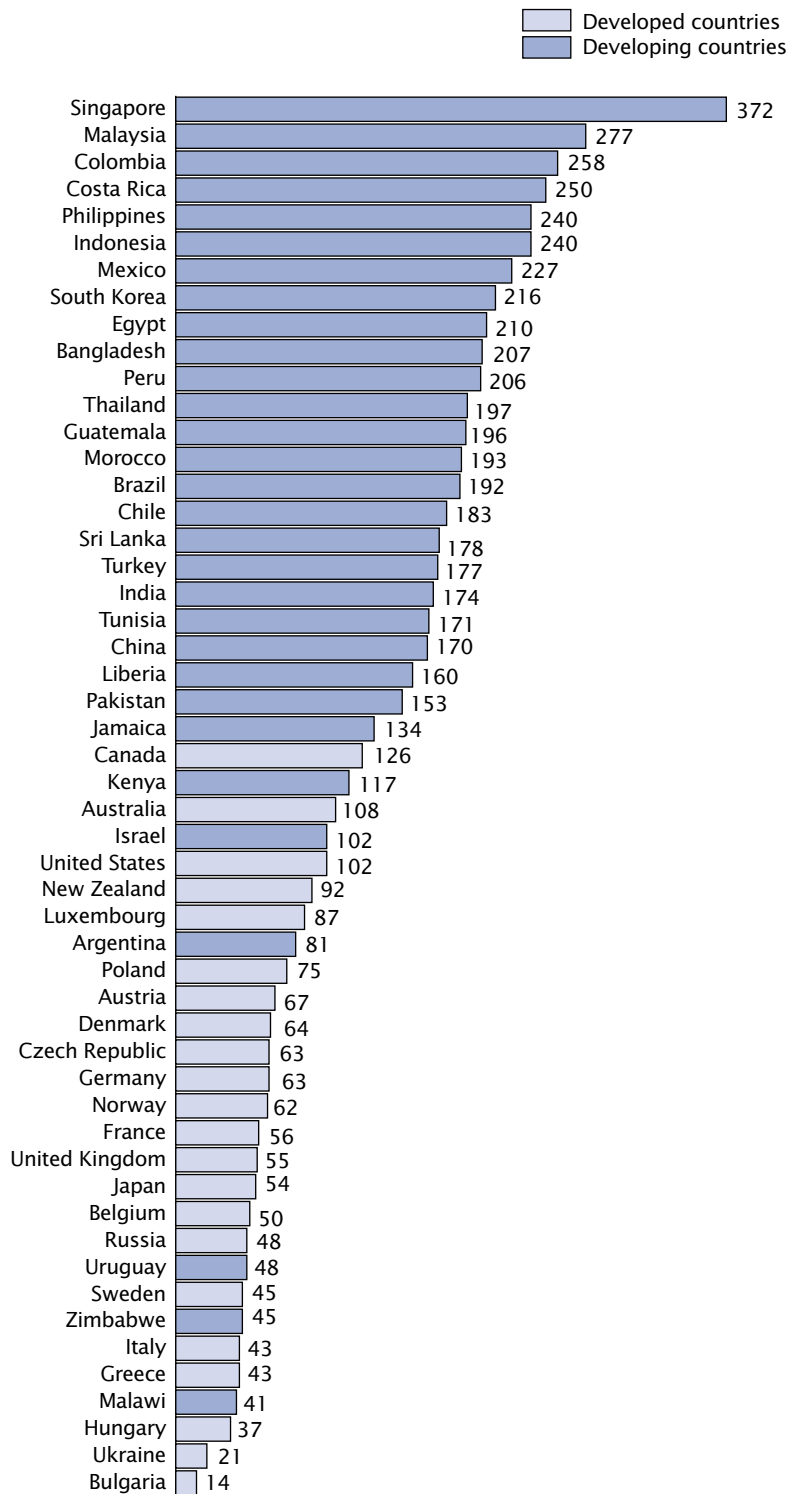
(Percent of population 65 years and over)



Source: U.S. Census Bureau, 2000a.

Figure 2-4.

Percent Increase in Elderly Population: 2000 to 2030



Source: U.S. Census Bureau, 2000a.

SOME ELDERLY POPULATIONS TO MORE THAN TRIPLE BY 2030

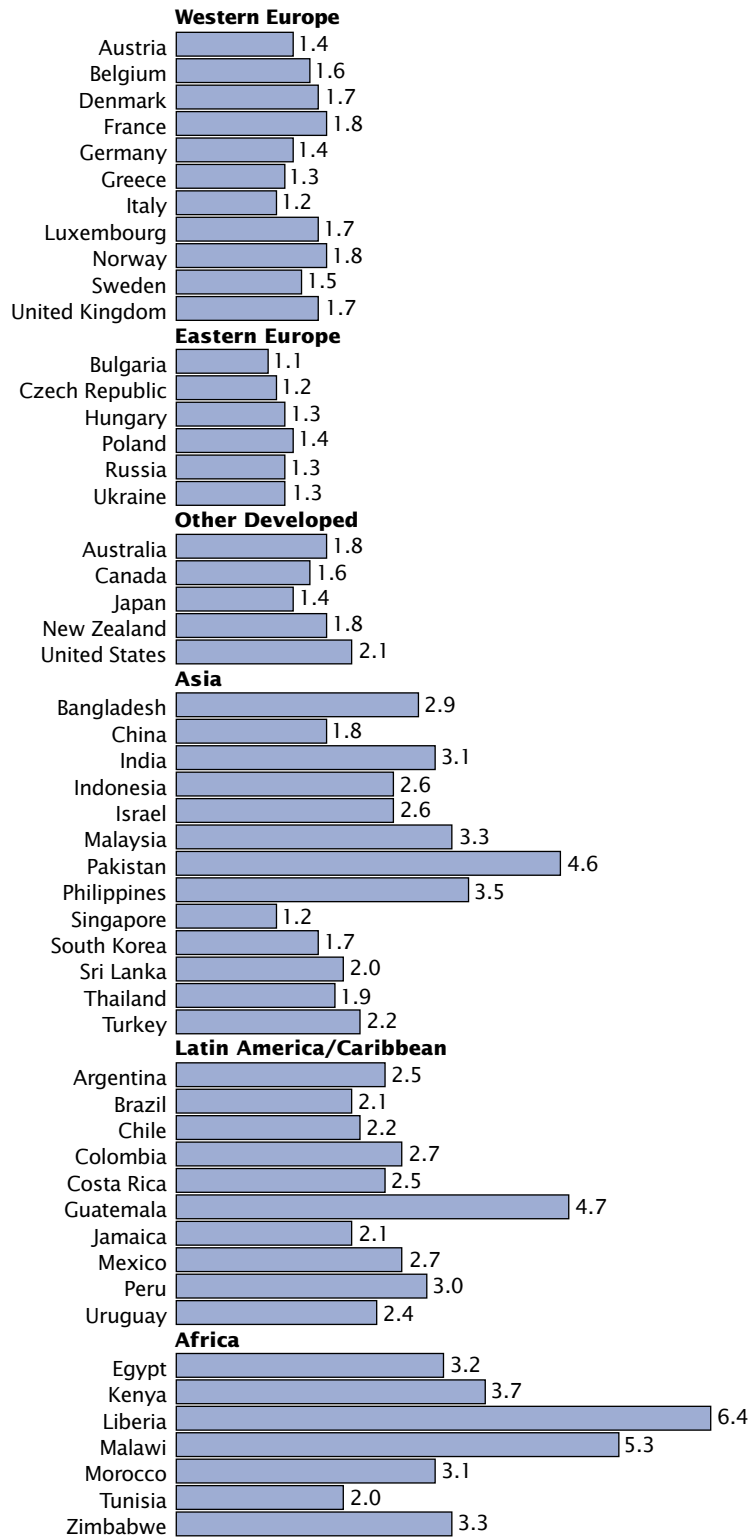
During the period 2000-2030, the projected increase in elderly population in the 52 study countries ranges from 14 percent in Bulgaria to 372 percent in Singapore (Figure 2-4). Today's "older" nations will experience relatively little change compared with many developing nations; in countries as diverse as Malaysia and Colombia, elderly populations are expected to expand to more than three times their size in 2000.

THE 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 (Figure 2-5). 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 older relative to 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 30 years. Although the aggregate TFR remains in excess of 4.5 children per woman in Africa and many countries of the Near East, 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. Total fertility in many developing countries — notably China, South Korea, Thailand, and at least a dozen Caribbean nations — is now at or below replacement level.

Figure 2-5.
Total Fertility Rate: 2000
(Births per woman)

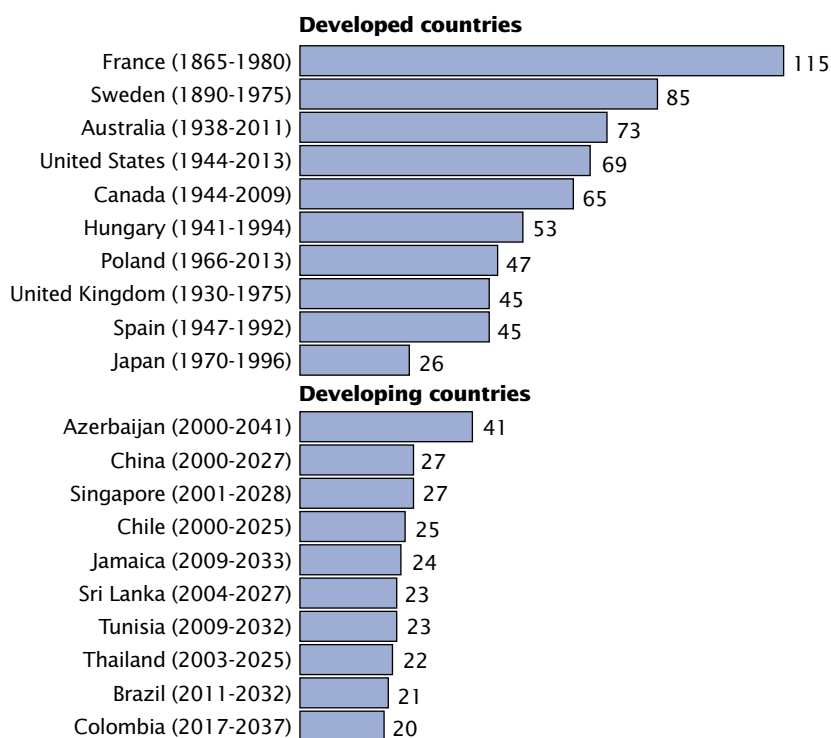


Source: U.S. Census Bureau, 2000a.

Figure 2-6.

Speed of Population Aging

(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; U.S. Census Bureau, 2000a.

EAST AND SOUTHEAST ASIA AGING THE FASTEST

In only one-quarter of a century — from 1970 to 1996 — the percent of population aged 65 and over in Japan increased from 7 to 14 percent (Figure 2-6). Similarly swift increases are expected in China, beginning around the turn of the century, and elsewhere in East and

Southeast Asia (South Korea, Taiwan, and Thailand), fueled by dramatic drops in fertility levels. The rapidity of change in this region stands in stark contrast to some European countries, where the comparable change occurred over a period of up to 115 years. Such rapidly aging societies are soon likely to face the often-

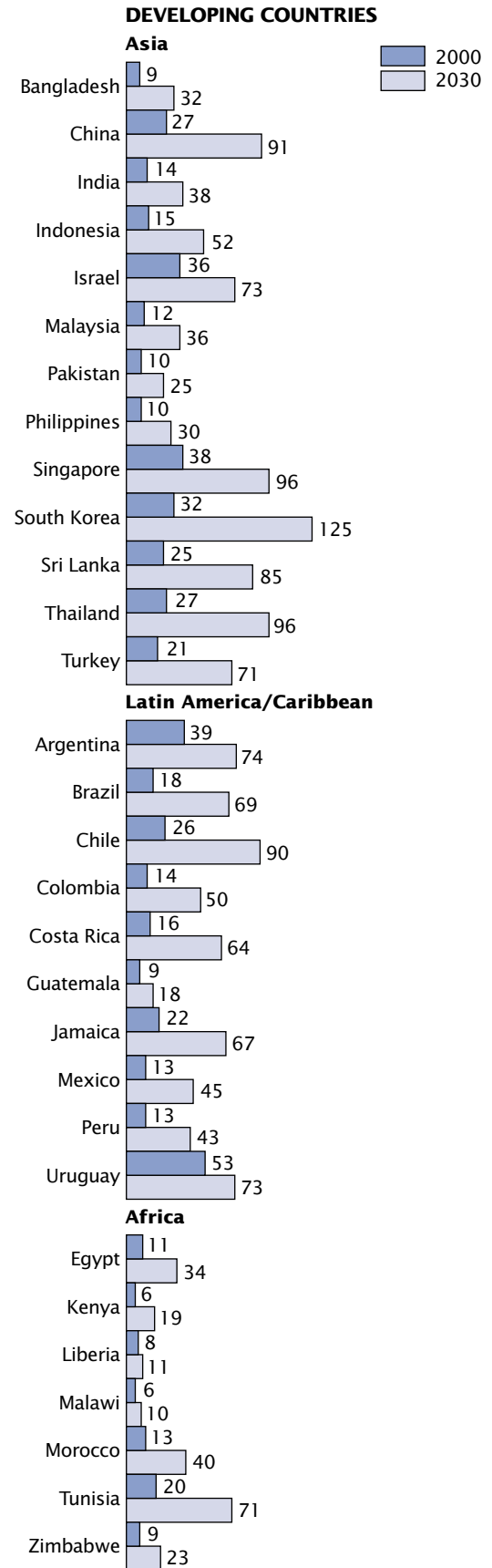
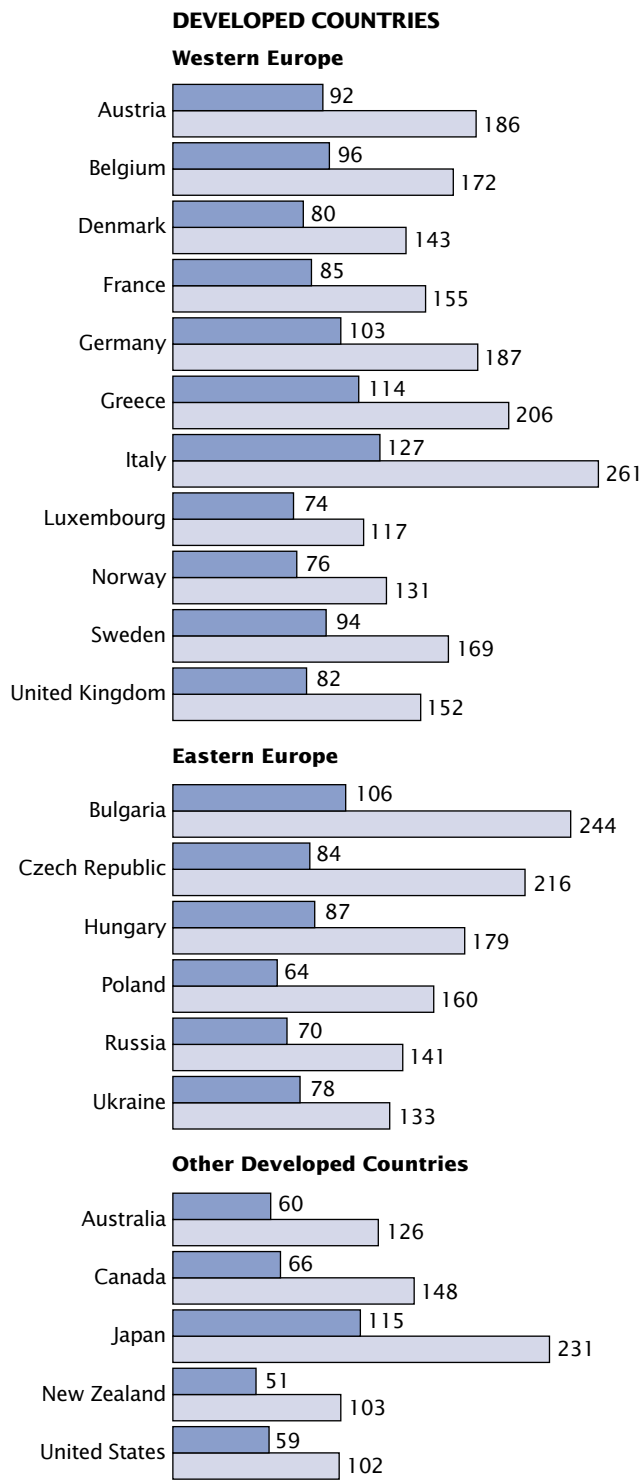
fractious debates over health care costs, social security, and intergenerational equity that have emerged in Europe and North America.

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. Among the 52 study countries in 2000, 5 countries (Germany, Greece, Italy, Bulgaria, and Japan) had more elderly than youth aged 0 to 14. By 2030, however, all developed countries in Figure 2-7 have a projected aging index of at least 100, and several European countries and Japan are in excess of 200. 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, 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 greater than in developed countries.

The aging index also is useful in examining within-country differences in the level of population aging. As noted in Chapter 5, there can be significant differences in the extent of aging between urban and rural areas. There may also be

Figure 2-7.
Aging Index: 2000 and 2030
 (People aged 65 and over per 100 people aged 0-14)

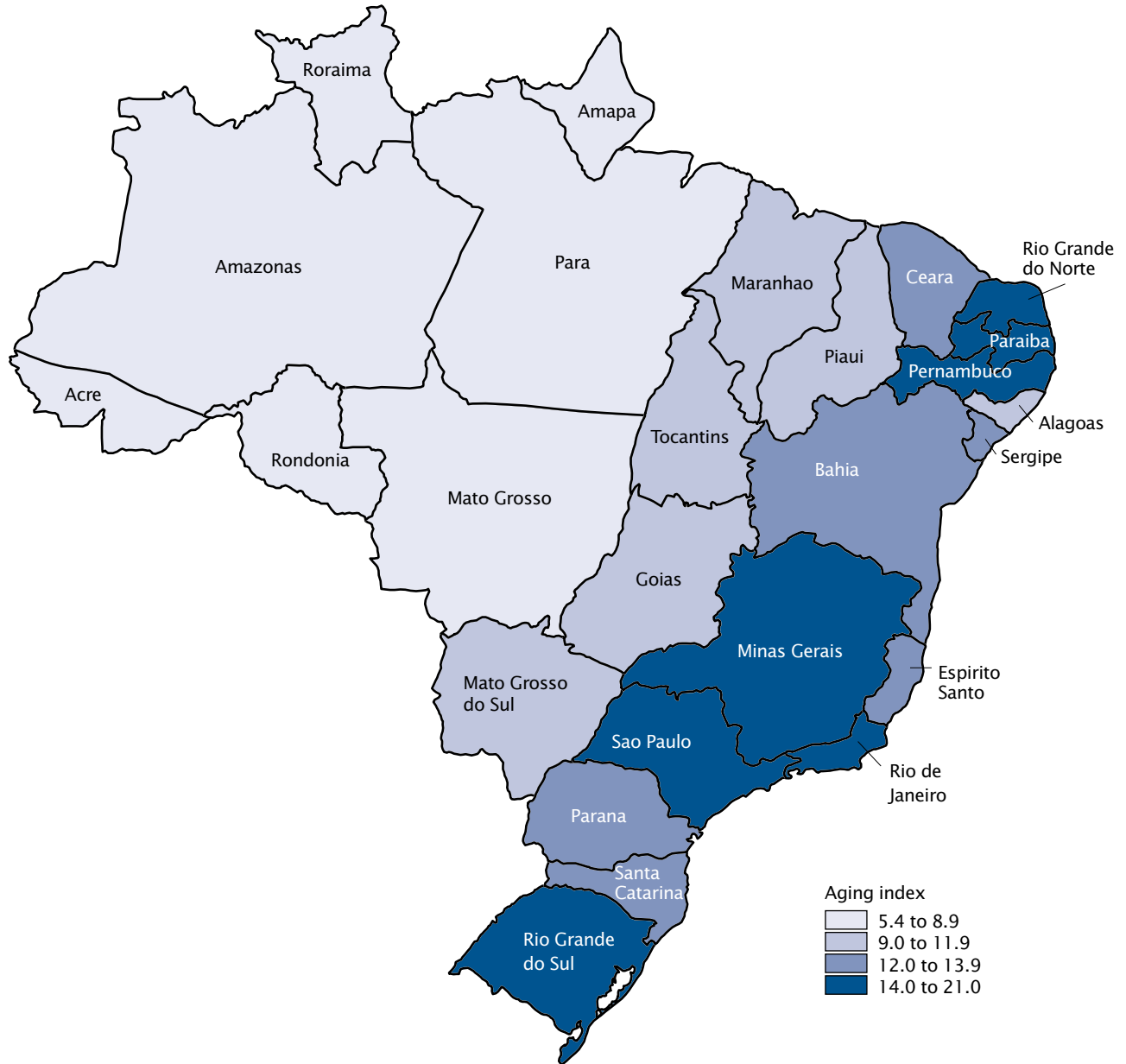


Source: U.S. Census Bureau, 2000a.

Figure 2-8.

Aging Index in Brazil by State: 1991

(Population aged 65 and over per 100 population aged 0-14)



Source: 1991 Census of Brazil.

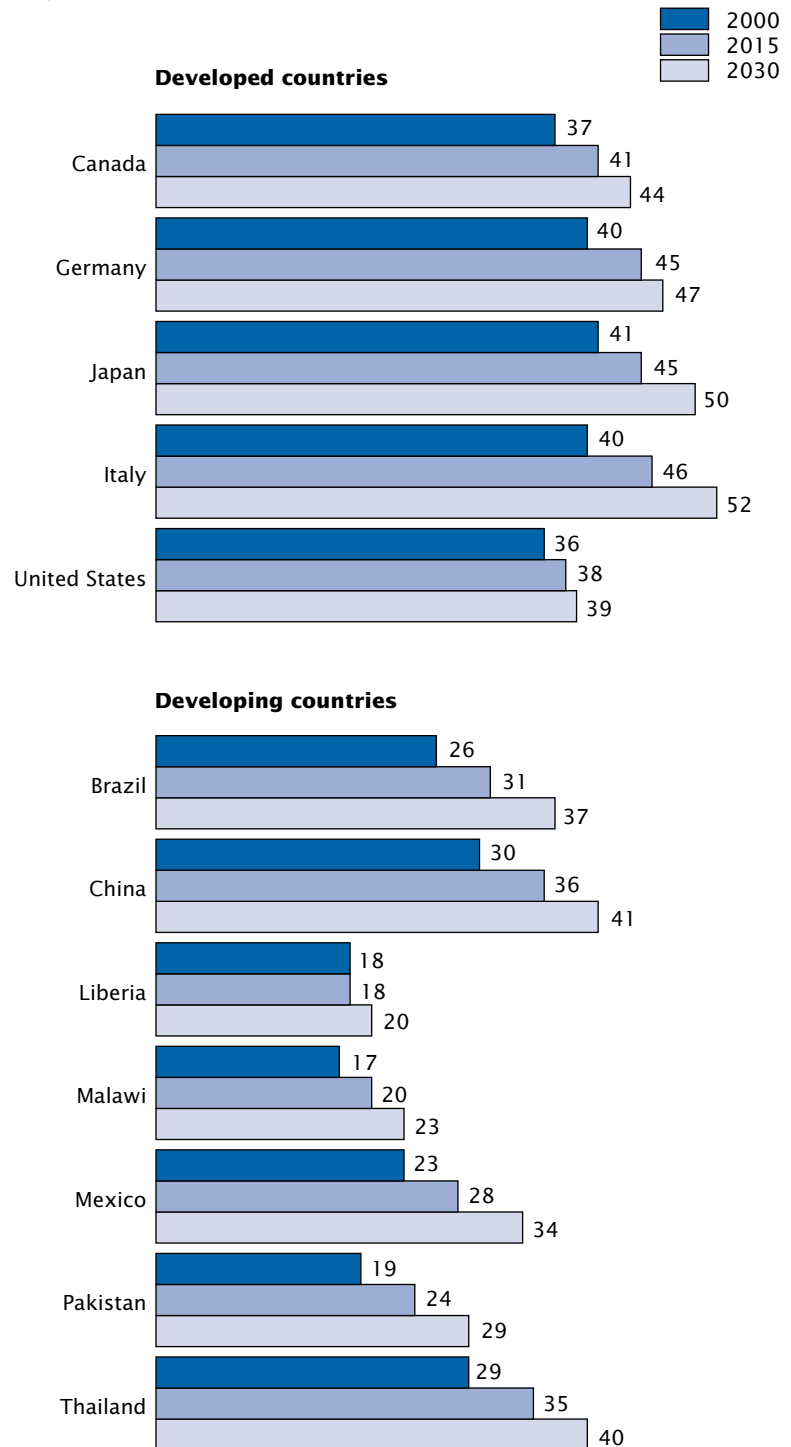
broader regional differences, especially in large nations such as Brazil (Figure 2-8). Based on 1991 census data, the overall aging index in Brazil was 14. However, this measure ranged from less than 6 in several northern states of the country to 21 in the state of Rio de Janeiro.

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 2000 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 2000 median ages of the 52 study countries ranged from 17 in Malawi to 41 in Japan. Developed countries are all above the 32-year level, while a majority of developing nations have median ages under 25. During the next three decades, the median age will increase in all 52 countries, though at very different rates. By 2030, Italy is projected to have the highest median age, with half its population aged 52 or over (Figure 2-9), reflecting in large part the extremely low level of fertility now occurring. By way of contrast, persistently high birth rates are likely to preclude a large change in median age in some developing countries (e.g., Liberia and Malawi).

Figure 2-9.
Median Age in 12 Countries: 2000, 2015, and 2030
(In years)



Source: U.S. Census Bureau, 2000a.

THE DYNAMICS OF POPULATION AGING

The process of population aging is, as noted earlier, primarily determined by fertility (birth) rates and secondarily by mortality (death) rates, so that populations with high fertility tend to have low proportions of older people and vice versa. Demographers use the term “demographic transition” to refer to a gradual process² wherein a society moves from a situation of 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 (Lee, 1994).

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 child-bearing 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-age adults, immigration of elderly

retirees from other countries, and return migration of former emigrants who are above the average population age; all three factors contribute to population aging. Some demographers expect international migration to 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 (see Box 2-1). Eventual shortages of workers may generate demands for immigrant labor (Peterson, 1999) and may force nations to choose between relaxed immigration policies and pronatalist strategies to raise birth rates (Kojima, 1996).

Figure 2-10 illustrates the historical and projected aggregate population age structure 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 1950, with a large percentage of the entire population under the age of 15. Given the relatively high rates of fertility that prevailed in most developing countries from 1950 through the early 1970s, the overall pyramid shape had not changed greatly by 1990. However, the effects of fertility and mortality decline can be seen in the projected pyramid for 2030, which loses its strictly triangular shape as the size of younger 5-year cohorts stabilizes and the elderly portion of the total population increases.

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

aged 25 to 44, and younger cohorts were becoming successively smaller. If fertility rates continue as projected through 2030, 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 much greater weight, particularly in relatively “aged” countries (Caselli and Vallin, 1990), and are discussed further in the next chapter.

ELDERLY POPULATIONS THEMSELVES OFTEN ARE AGING

An increasingly important feature of societal aging is the progressive aging of the elderly population itself. Over time, a nation's elderly population may grow older on average as a larger proportion survives to 80 years and beyond. In many countries, the “oldest old” (people aged 80 and over) are now the fastest growing portion of the total population. In the mid-1990s, the global growth rate of the oldest old was somewhat lower than that of the world's elderly, a result of low fertility that prevailed in many countries around the time of World War I. In other words, people who were reaching age 80 in 1996, for example, were part of a relatively small birth cohort. The growth rate of the world's oldest-old population from 1996 to 1997 was only 1.3 percent. Just a few years later, however, the fertility effects of World War I had dissipated; from 1999 to 2000, the growth rate of the world's 80-and-over population had jumped to 3.5 percent,

² The concept of demographic transition admittedly is a broad one, and some would argue that it has many permutations or that there is more than one form of demographic transition; see, for example, the discussion in Coale and Watkins (1986).

Box 2-1.

Population Aging in the Context of Overall Population Decline

European demographers have sounded warning bells for at least the last 30 years with regard to the possibility of declining population size in industrialized nations. Until very recently, however, this idea had not permeated public discourse. Societies were aware that they were aging, but the equation of aging with population decline was uncommon. In the last 2 years, the visibility of likely population decline has increased dramatically, in large part due to United Nations (2000a; 2000b) reports suggesting that populations in most of Europe and Japan will decrease in size over the next 50 years, and to publicity accorded to actual declines in Spain, Italy, Russia, and other nations.

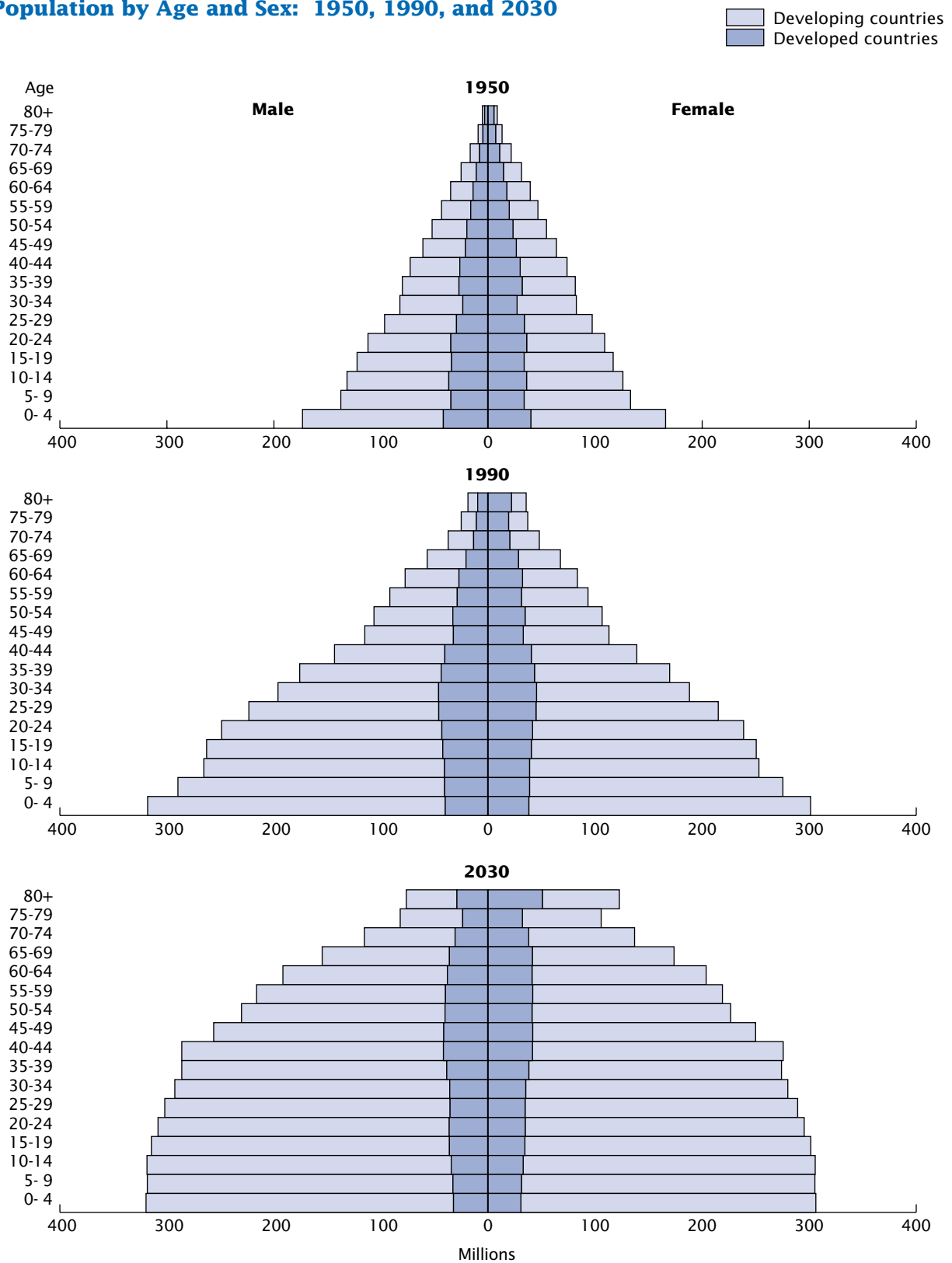
This trend raises several contentious issues: Is persistent below-replacement fertility a threat to European and other societies, and if so, can it be altered? To what extent, if any, should so-called “replacement migration” be encouraged as a mechanism to offset population aging? Are there important macroeconomic (e.g., transnational capital flows; changes in national savings rates) and national security issues that should be considered?

There are no hard and fast answers to these questions. One study (Bongaarts and Bulatao, 2000) examined the experience of the diverse set of countries that have made the transition to low fertility. In very few of these countries has fertility stabilized at rates above two children per woman. Such an occurrence would be dependent on substantial proportions of higher-order births, but higher-order births are largely “anachronistic” in industrial-country settings. The tentative conclusion was that fertility is unlikely to rebound significantly, but it has been noted that few demographers anticipated the post-World War II baby boom that will soon have a major impact on population aging. Governments have employed 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; or measures to reduce the opportunity costs of additional childbearing. These policies have had modest impacts in authoritarian states, but only minimal impacts in liberal democracies such as France and Sweden (Teitelbaum, 2000). Industrial societies already provide various rewards, but using them to deliberately manipulate fertility is a sensitive issue, potentially involving substantial economic transfers.

The United Nations (2000a) undertook an examination of the likely impact of migration as a counterbalance to aging, building on earlier work by Lesthaeghe, Page, and Surkyn (1988), the Organization for Economic Co-Operation and Development (1991), and others. The conclusion was that inflows of migrants will not be able to prevent European population declines in the future, nor rejuvenate national populations, unless the migration flows are of very large magnitude (i.e., millions annually). On the heels of this report, the United Nations convened an Expert Group Meeting on Policy Responses to Population Aging and Population Decline in October 2000. The consensus of the experts was that replacement migration was not a viable “solution” in and of itself, but could buffer the likely impact of future aging if used by governments in conjunction with other policies (e.g., increased labor force participation, especially among women; fertility inducements as noted above). With regard to global financial and security issues, little systematic work has been done on overall impacts, though researchers are beginning to explore and model various scenarios (see, e.g., CSIS and Watson Wyatt, 2000; Eberstadt, 2000; MacKellar and Ermolieva, 2001; Mason et al., 2001).

Figure 2-10.
Population by Age and Sex: 1950, 1990, and 2030



Sources: United Nations, 1999 and U.S. Census Bureau, 2000a.

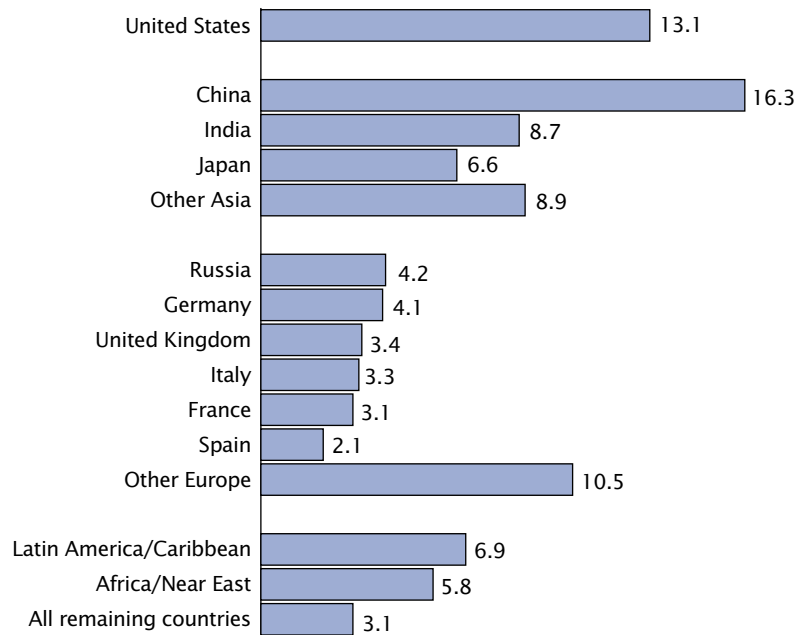
considerably higher than that of the world's elderly as a whole (2.3 percent). In the future, we expect to see sustained high growth of the oldest old. In the first decade of the twenty-first century, the projected average annual growth rate of the 80-and-over population is 3.9 percent (versus 2.0 percent for the 65-and-over population), and is expected to remain above 3 percent during the period 2010-2020.

The oldest old constituted 17 percent of the world's elderly in 2000: 22 percent in developed countries and 13 percent in developing countries. More than half (53 percent) of the world's oldest old in 2000 lived in just six countries: China, the United States, India, Japan, Germany, and Russia (Figure 2-11). About an additional one-fifth (22 percent) lived elsewhere in Europe, while 7 percent lived in Latin America/Caribbean and about 6 percent lived in Africa/Near East regions, and another 9 percent in Asian countries other than China, India, and Japan.

Among the 52 study countries, the percentage of oldest old in the total population in 2000 was less than half a percent in several developing countries (e.g., Egypt, Guatemala, Indonesia, Kenya, and Malawi). In contrast, the oldest old constituted 5 percent of the total population of

Figure 2-11.

Percent Distribution of World Population Aged 80 and Over: 2000



Note: Data represent the share of the world's total oldest old in each country or region. Individual countries with more than 2.0 percent of the total are shown separately.
Source: U.S. Census Bureau, 2000a.

Sweden, and 4 percent or more of the total in several other European countries (Denmark, Italy, Norway, and the United Kingdom). In general, Western European nations are above 3 percent, while other developed countries are between 2 and 3 percent. In most developing nations, less than 1 percent of the population is aged 80 and over, although some developing

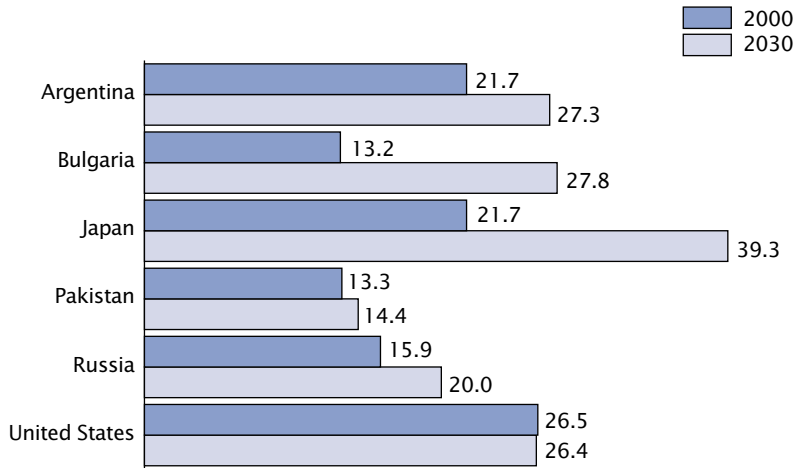
countries (e.g., Barbados, Cuba, Puerto Rico, and Uruguay) have higher levels than many Eastern European nations.

Countries vary considerably in the projected age components of elderly populations. In the United States, the oldest old were 26 percent of all elderly in 2000, and are expected to continue to be 26 percent in

Figure 2-12.

Oldest Old as a Percent of All Elderly: 2000 and 2030

(People aged 80 and over as a percent of people aged 65 and over)



Source: U.S. Census Bureau, 2000a.

2030 (Figure 2-12). Some European nations will experience a sustained rise in this ratio, while others will see an increase during the next two decades and then a subsequent decline. The most striking global increase is likely to occur in Japan; by 2030, nearly 40 percent of all elderly Japanese are expected to be at least 80 years old. Most developing countries should experience modest long-term increases in this ratio.

Stability in the proportion of oldest old in the elderly population should not deflect attention from burgeoning absolute numbers. In the United States, the oldest old increased from 374 thousand in 1900 to more than 9 million today. The small percentage decline for the United States in Figure 2-12 masks a projected absolute increase of over 9 million oldest-old people. Four-generation families are becoming increasingly common (Soldo, 1996), and the aging of the baby

boom may produce a great-grandparent boom in many countries. The numerical growth and increasing heterogeneity of the oldest old compel social planners to seek further health and socioeconomic information about this group, because the oldest old consume disproportionate amounts of health and long-term care services (Suzman, Willis, and Manton, 1992). Past population projections often have underestimated the improvement in mortality rates among the oldest old, and as the next chapter points out, actual numbers of tomorrow's oldest old could be much higher than presently anticipated. Because of the sustained increases in longevity in many nations, greater age detail is needed for the oldest old. In the past, comparable population projections for the world's countries often grouped everyone aged 80 and over into a single, open-ended component. Today, for the first time, agencies (e.g., the United Nations Population Division; the U.S. Census Bureau's International Programs Center) are producing sets of international population projections that expand the range of older age groups up to an open-ended category of age 100 and over.

Box 2-2.

The Growth of Centenarians

As average length of life increases, the concept of “oldest old” will change. While people of extreme old age constitute a tiny portion of total population in most of the world, their numbers are of growing importance, especially in more-developed nations. Thanks to improvements in nutrition, health, and health care, we now have for the first time in history the opportunity to consider significant numeric growth of the population aged 100 and over. According to researchers in Europe, the number of centenarians has doubled each decade since 1950 in industrialized countries. 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.

There are several problems with obtaining accurate age data on very old people (Kestenbaum, 1992; Elo et al., 1996), and estimates of centenarians from censuses and other data sources should be scrutinized carefully. For example, the 1990 United States census recorded some 37,000 centenarians, although due to age misreporting, the actual figure is thought to be closer to 28,000, (Krach and Velkoff, 1999). Still, this represents a doubling of the population aged 100 and over from 1980 to 1990, similar to estimates for European nations. The potentially spectacular increase in numbers of centenarians is illustrated by data and projections for France. Dinh (1995) has estimated that there were about 200 centenarians in France in 1950, and that by the year 2000 the number would be 8,500. His 50-year projections suggest 41,000 people aged 100 and over by 2025, increasing to 150,000 in 2050. If these projections are realized, the number of centenarians in France will have multiplied by a factor of 750 in one century.

Life Expectancy and Changing Mortality

The spectacular increases in human life expectancy that began in the mid-1800s and continued during the following century are often ascribed primarily to improvements in medicine. However, the major impact of improvements both in medicine and sanitation did not occur until the late nineteenth century. Earlier and more important factors in lowering mortality were innovations in industrial and agricultural production and distribution, which improved nutrition for large numbers of people (Thomlinson, 1976). A growing 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 (Moore, 1993).

LIFE EXPECTANCY AT BIRTH EXCEEDS 78 YEARS IN 28 COUNTRIES

Life expectancy at birth in Japan and Singapore has reached 80 years, the highest level of all the world's major countries, and has reached 79 years in several other developed nations (e.g., Australia, Canada, Italy, Iceland, Sweden, and Switzerland). Levels for the United States and most other developed countries fall in the 76-78 year range (Figure 3-1). Throughout the developing world, there are extreme variations in life expectancy at birth (Figure 3-2). While the levels in some developing nations match or exceed those in many

European nations, the normal lifetime in many African countries spans fewer than 45 years. On average, an individual born in a more-developed country can now expect to outlive his/her counterpart in the less-developed world by 13 years.

TWENTIETH CENTURY LIFE EXPECTANCY HAS DOUBLED IN SOME DEVELOPED COUNTRIES

Table 3-1 shows the enormous strides that countries have made in extending life expectancy since 1900. In developed countries, the average national gain in life expectancy at birth was 66 percent for males and 71 percent for females during the period 1900-90. In Italy, life expectancy at birth for women increased from 43 years in 1900 to over 82 years in 2000. In some cases, life expectancy has more than doubled during the century (e.g., Spain).

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 many 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 the HIV/AIDS epidemic. The most dramatic gains in the developing world have been in East Asia, where life expectancy at birth increased from less than 45 years in 1950 to more than 72 years today.

TREND IN RISING LIFE EXPECTANCY MAY BE CHALLENGED

While global gains in life expectancy at birth have been the norm, unforeseen changes and epidemics may reverse the usual 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 significantly and in some cases leveled off. From the early 1950s to the early 1970s, for example, male life expectancy changed little in Australia, the Netherlands, Norway, and the United States. After this period of stagnation, male life expectancy again began to rise.

In 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

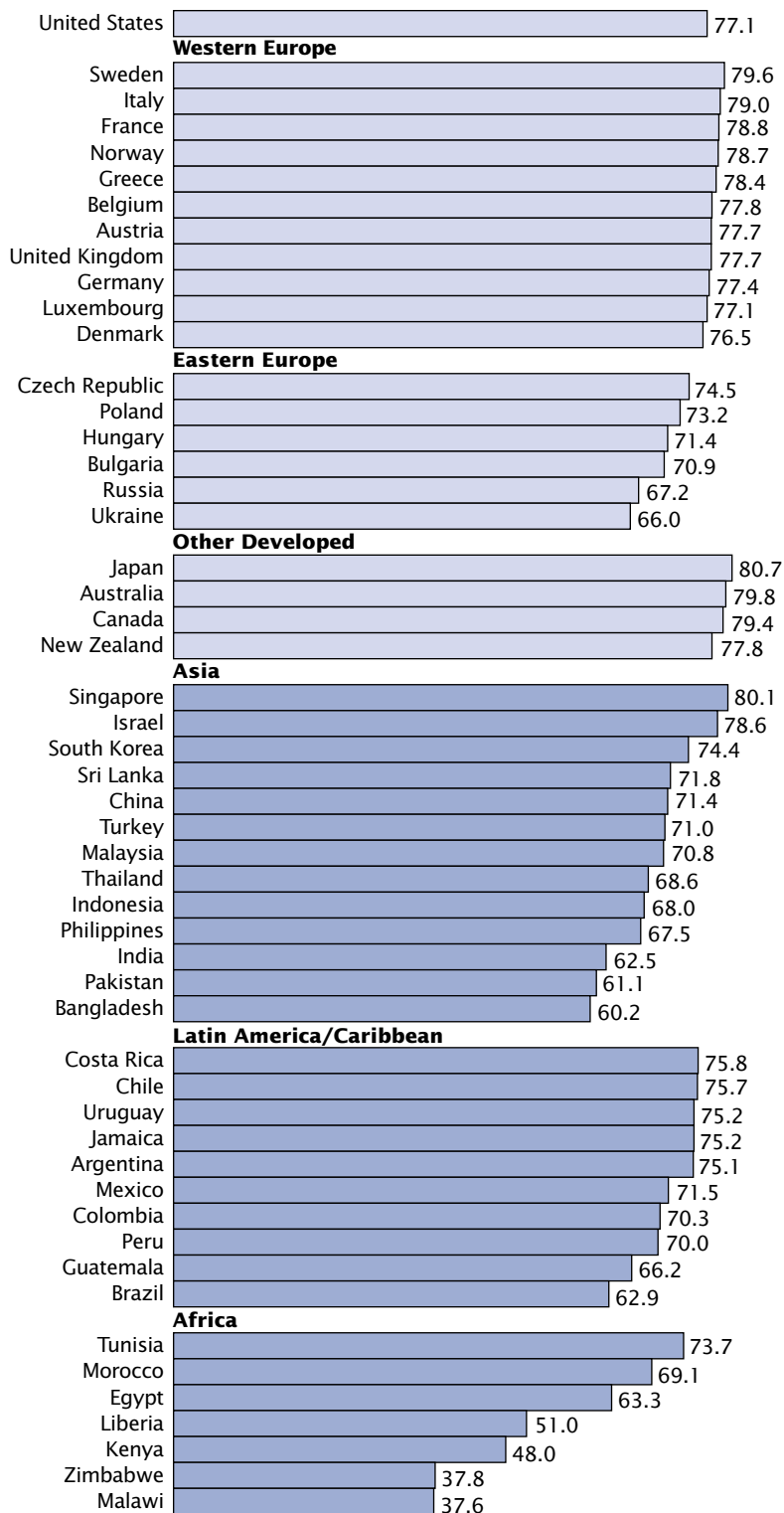
(e.g., tuberculosis) to minimal levels (Vishnevsky, Shkolnikov, and Vassin, 1991). Resultant gains in life expectancy in excess of 5 years per decade were common. By the mid-1960s, however, the rate of increase had decelerated sharply. In the 1970s and 1980s, changes in female life expectancy at birth were erratic, while male life expectancy fell throughout the region (Bobadilla and Costello, 1997). Following the demise of the former Soviet Union, the decline has continued into the 1990s in some countries. The decline has been particularly severe for Russian men; between 1987 and 1994, male life expectancy at birth plummeted 7.3 years to a level of 57.6, before beginning to rise again in recent years (Figure 3-3). The large increases in adult male mortality usually are attributed to a combination of factors including increased homicide and accident rates, excessive alcohol consumption, poor diet, and environmental/workplace degradation (Virganskaya and Dmitriev, 1992; Murray and Bobadilla, 1997), although most researchers take pains to point out that clear causal mechanisms remain poorly understood.

Figure 3-1.

Life Expectancy at Birth: 2000

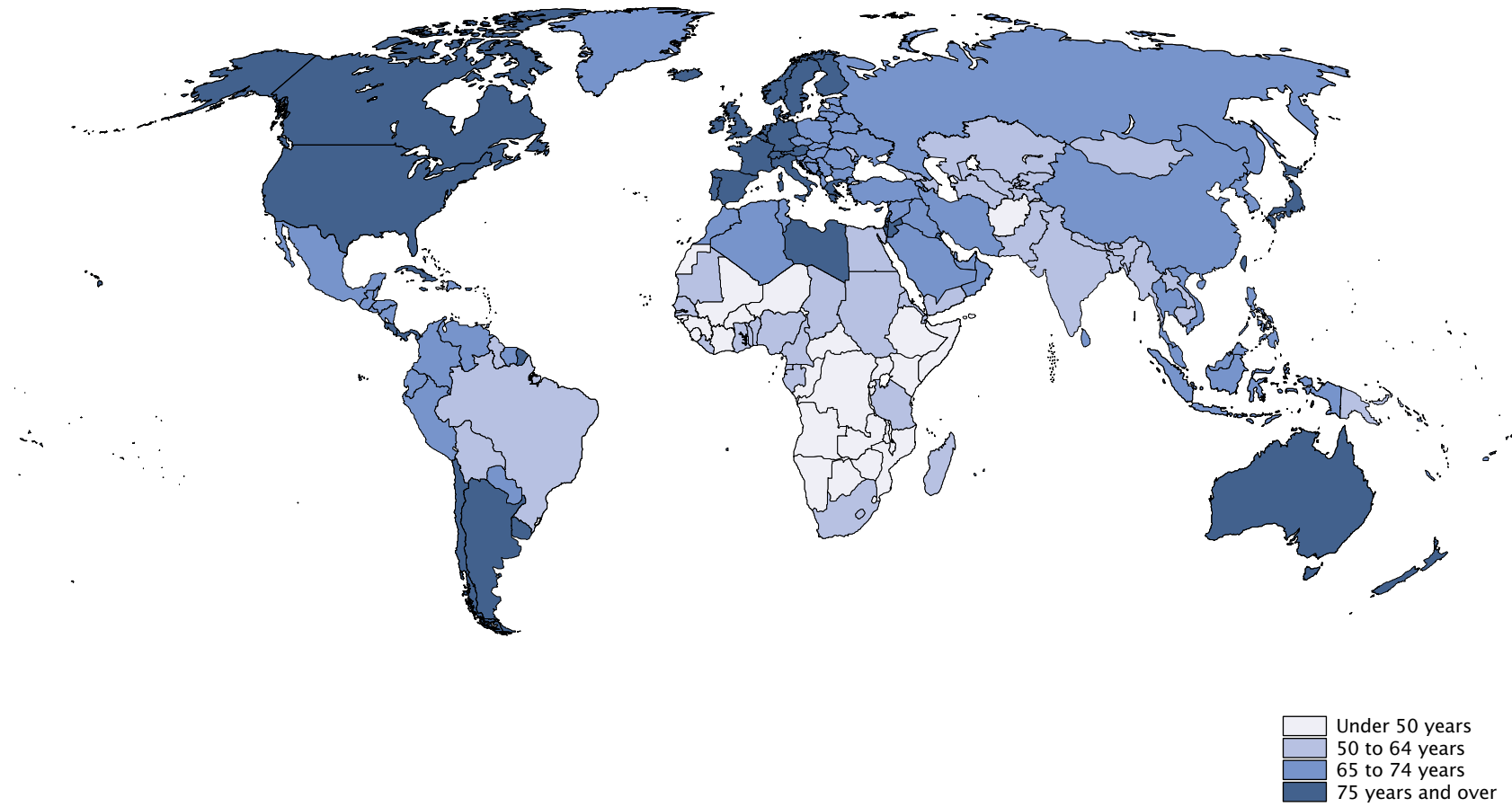
(In years)

Developed countries
Developing countries



Source: U.S. Census Bureau, 2000a.

Figure 3-2.
Life Expectancy at Birth: 2000



Source: U.S. Census Bureau, 2000a.

Table 3-1.
Life Expectancy at Birth in 34 Countries: 1900 to 2000

(In years)

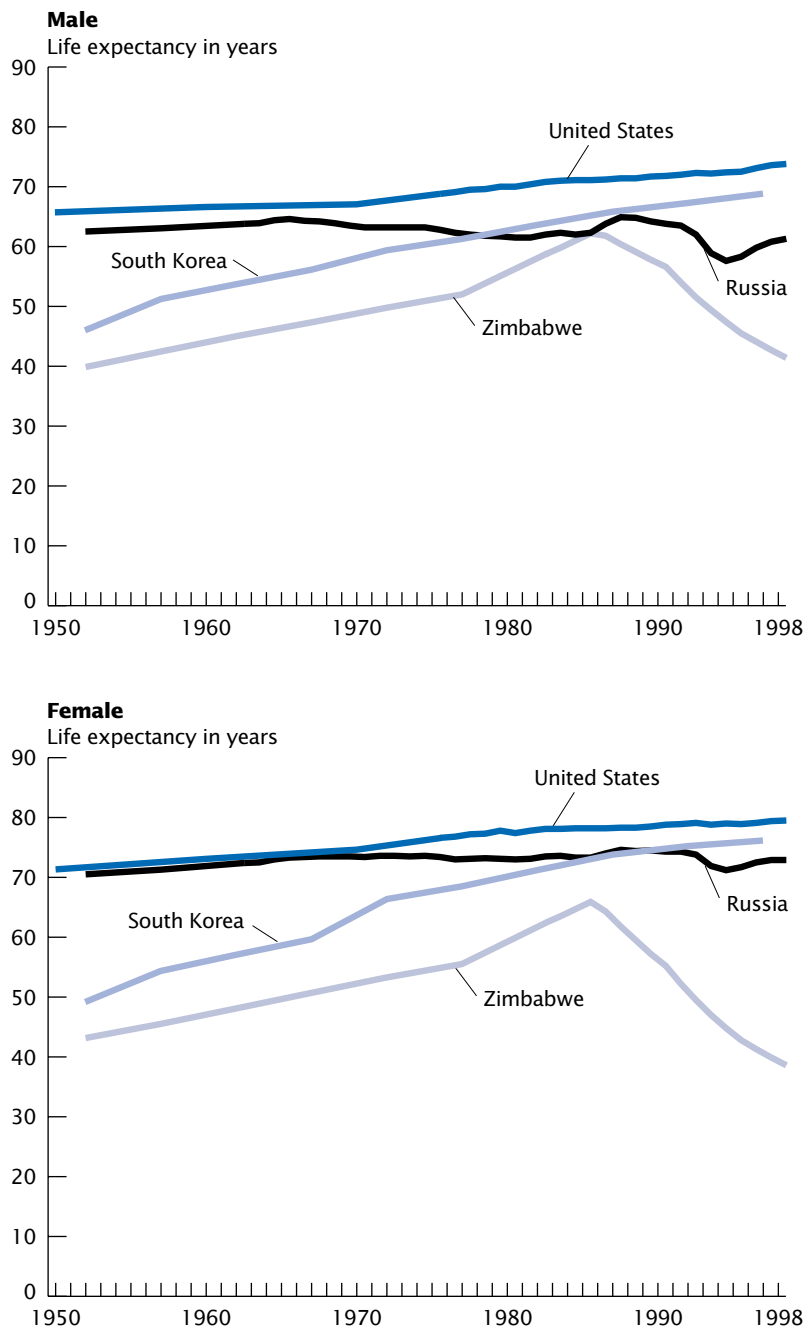
Region/country	Circa 1900		Circa 1950		2000	
	Male	Female	Male	Female	Male	Female
DEVELOPED COUNTRIES						
Western Europe						
Austria	37.8	39.9	62.0	67.0	74.5	81.0
Belgium	45.4	48.9	62.1	67.4	74.5	81.3
Denmark	51.6	54.8	68.9	71.5	74.0	79.3
France	45.3	48.7	63.7	69.4	74.9	82.9
Germany ¹	43.8	46.6	64.6	68.5	74.3	80.8
Norway	52.3	55.8	70.3	73.8	75.7	81.8
Sweden	52.8	55.3	69.9	72.6	77.0	82.4
United Kingdom	46.4	50.1	66.2	71.1	75.0	80.5
Southern and Eastern Europe						
Czech Republic ¹	38.9	41.7	60.9	65.5	71.0	78.2
Greece	38.1	39.7	63.4	66.7	75.9	81.2
Hungary	36.6	38.2	59.3	63.4	67.0	76.1
Italy	42.9	43.2	63.7	67.2	75.9	82.4
Spain	33.9	35.7	59.8	64.3	75.3	82.5
Other						
Australia	53.2	56.8	66.7	71.8	76.9	82.7
Japan	42.8	44.3	59.6	63.1	77.5	84.1
United States	48.3	51.1	66.0	71.7	74.2	79.9
	Circa 1950			2000		
	Male	Female	Male	Female	Male	Female
DEVELOPING COUNTRIES						
Africa						
Egypt	41.2	43.6	61.3	65.5		
Ghana	40.4	43.6	56.1	58.8		
Mali	31.1	34.0	45.5	47.9		
South Africa	44.0	46.0	50.4	51.8		
Uganda	38.5	41.6	42.2	43.7		
Congo (Brazzaville)	37.5	40.6	44.5	50.5		
Asia						
China	39.3	42.3	69.6	73.3		
India	39.4	38.0	61.9	63.1		
Kazakhstan	51.6	61.9	57.7	68.9		
South Korea	46.0	49.0	70.8	78.5		
Syria	44.8	47.2	67.4	69.6		
Thailand	45.0	49.1	65.3	72.0		
Latin America						
Argentina	60.4	65.1	71.7	78.6		
Brazil	49.3	52.8	58.5	67.6		
Costa Rica	56.0	58.6	73.3	78.5		
Chile	57.8	61.3	72.4	79.2		
Mexico	49.2	52.4	68.5	74.7		
Venezuela	53.8	56.6	70.1	76.3		

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

Note: Reliable estimates for 1900 for most developing countries are not available.

Source: UNDIESA 1988; Siampos 1990; and U.S. Census Bureau, 2000a.

Figure 3-3.
Life Expectancy at Birth in Four Countries: 1950 to 1998



Sources: United Nations, 1999; U.S. Census Bureau, 2000a; and country sources.

Elsewhere, the HIV/AIDS epidemic has had a devastating impact on life expectancy, particularly in parts of Africa. The effect of the epidemic on life expectancy at birth may be considerable, given that AIDS deaths often are concentrated in the childhood and middle adult (30 to 45) ages. Projections to the year 2010 suggest that AIDS may reduce life expectancy at birth by more than 30 years from otherwise-expected levels in countries such as Botswana, Namibia, South Africa, and Zimbabwe. And while the common perception of AIDS mortality usually associates AIDS deaths with children and younger adults, the epidemic may have a direct and growing effect on older populations. In the United States in 1992, nearly three times as many people aged 60 and over died of AIDS as did people under age 20. Between 1987 and 1992, the annual number of U.S. children who died of AIDS remained relatively stable, whereas the number of deaths to people aged 60 and over nearly doubled (Hobbs and Damon, 1996).

FEMALE ADVANTAGE IN LIFE EXPECTANCY NEARLY UNIVERSAL

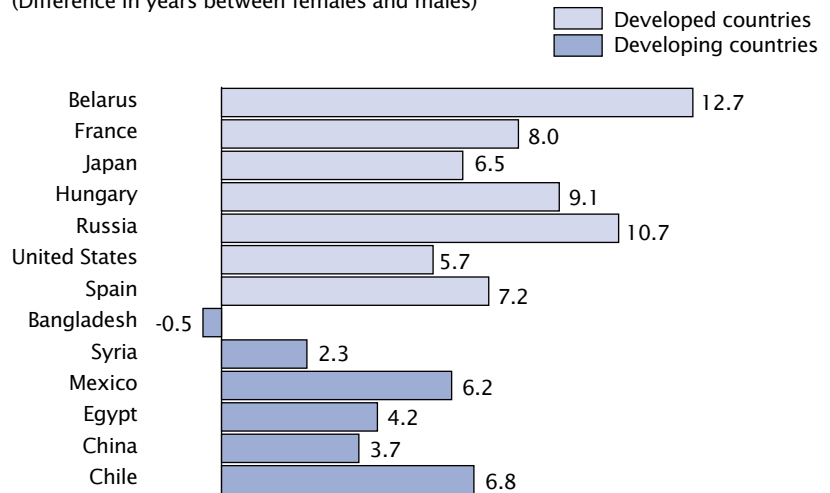
The widening of the sex differential in life expectancy has been a central feature of mortality trends in developed countries in the twentieth century. In 1900, in Europe and North America, women typically outlived men by 2 or 3 years. Today, the average gap between the sexes is roughly 7 years, but exceeds 12 years in parts of the former Soviet Union as a result of the unusually high levels of male mortality discussed above (Figure 3-4). 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 over 30 countries and is approaching this level in many other nations. The gender differential usually is smaller in developing countries, commonly in the 3-6 year range, and even is reversed in some South Asian and Middle East societies where cultural factors (such as low female social status and preference for male rather than female offspring) are thought to contribute to higher male than female life expectancy at birth.

MALE MORTALITY SUBSTANTIALLY HIGHER THAN FEMALE MORTALITY AT OLDER AGES

The data in Figure 3-5 illustrate the usual gender pattern of mortality at older ages, wherein male rates are seen to be consistently higher than female rates. In Canada and Germany, for instance, male mortality rates for ages 65 to 74 are roughly twice as great as corresponding female rates. Among countries, though, age-specific mortality rates can differ widely even where overall mortality appears similar.

Figure 3-4.
Female Advantage in Life Expectancy at Birth: 2000

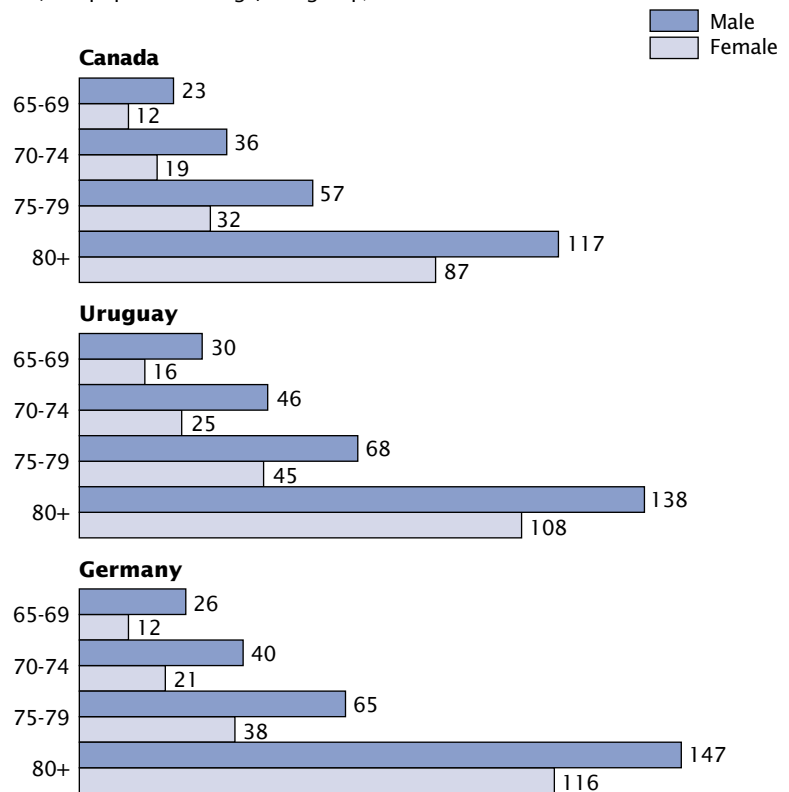
(Difference in years between females and males)



Source: U.S. Census Bureau, 2000a.

Figure 3-5.
Mortality Rates at Older Ages: 2000

(Per 1,000 population in age/sex group)

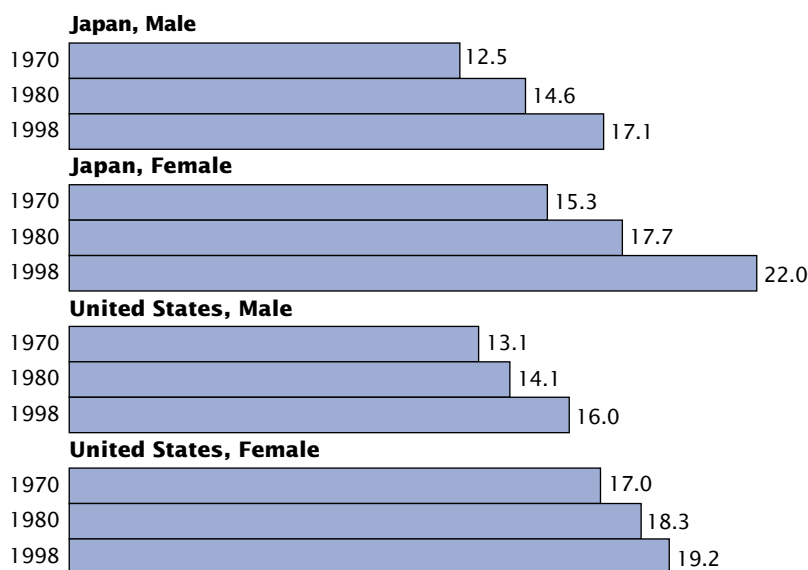


Source: Estimated by the U.S. Census Bureau based on individual country sources.

Figure 3-6.

Life Expectancy at Age 65 in Japan and the United States: 1970, 1980, and 1998

(Years of life remaining for those who reach age 65)



Source: U.S. Census Bureau, 2000a.

For example, total life expectancy at birth in 1995 was about the same in Cuba (75.4 years) and Portugal (74.7 years). However, World Health Organization data for 1995 show that the female mortality rate for ages 55 to 64 was 30 percent lower in Portugal than in Cuba, and the female mortality rate at ages 65 to 74 was about 20 percent lower. For older men, on the other hand, rates were 15 percent higher in each age group in Portugal than in Cuba.

WILL THE GENDER GAP IN LIFE EXPECTANCY NARROW?

Precise explanations of the gender difference in life expectancy still elude scientists because of the apparent complex interplay of biological, social, and behavioral conditions. Greater exposure to risk factors such as tobacco and alcohol use and occupational hazards is

cited as a source of higher male mortality rates (Statistics Canada, 1997), 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. However, data from industrialized countries still show no clear pattern of change in the gender gap; the gap is widening in most of Eastern Europe and the former Soviet Union and tends to be narrowing in other developed countries. In the United States, for instance, life expectancy at birth increased 3.0 years for men and 1.6 years for women between 1980 and 1996. But in some nations with very high overall life expectancy (e.g., France, Germany, Japan), gains in female longevity continue to outpace those of males.

Given the small average gender gap in life expectancy in developing countries relative to developed

nations, most demographers expect to see a widening of the female/male difference in upcoming decades, along the lines of the historical trend in industrialized nations. 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. 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 (Liu, Hermalin, and Chuang, 1998).

OLD-AGE MORTALITY RATES DECLINING OVER TIME

In countries where infant mortality rates are still relatively high but declining, 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 begin to assume greater weight (Caselli and Vallin, 1990; Gjonca, Brockmann, and Maier, 1999). Most countries are experiencing a rise in life expectancy at age 65, as exemplified by Japanese and U.S. data in Figure 3-6. The average Japanese woman reaching age 65 in 1998 could expect to live an additional 22 years, and the average man more than 17 years. Overall (i.e., both sexes combined) Japanese life expectancy at age 65 increased 40 percent from 1970 to 1998, compared with an overall increase in life expectancy at birth of 9 percent. Comparative figures for the United States are 17 and 8 percent,

respectively. Although greater relative improvement in life expectancy at older ages may not yet be widespread in developing regions of the world, the proportional increase in life expectancy at older ages is approaching or has surpassed the relative increase in life expectancy at birth in some developing countries, notably in Latin America and the Caribbean (Kinsella, 1994).

The rise in life expectancy at age 65 that is characteristic of most societies means that the chances of dying for particular older age groups are declining. Figure 3-7 shows across-the-board declines in mortality in two older age groups (with the exception of women aged 80 to 84 in Mauritius) during a fairly recent 10-year period. In general, mortality improvements for people aged 70 to 74 have been greater than for people aged 80 to 84, reflecting the growing robustness of younger elderly cohorts.

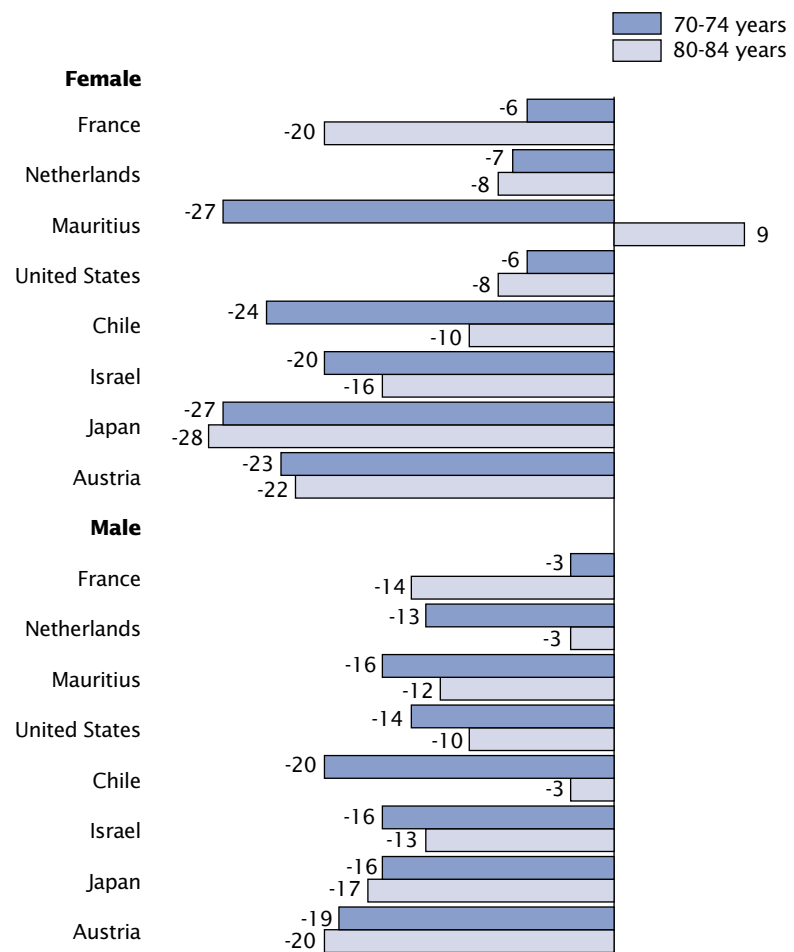
MORTALITY RATE INCREASE APPEARS TO LESSEN AT VERY OLD AGES

As long ago as the early 1800s, research demonstrated that the human death rate increases with age in an exponential manner, at least to the upper ranges of the age distribution. Recently, researchers have documented that, at very old ages, the rate of increase in the mortality rate tends to slow down. In a study of 28 countries with reasonably-reliable data for the period 1950-90, Kannisto (1994) noted not only a decline in mortality rates at ages 80 and over, but a tendency toward greater decline in more-recent time periods. Other work has confirmed this tendency (e.g., Wilmoth et al., 2000), and a recent study in the United States suggests that the age at which mortality

Figure 3-7.

Percent Change in Death Rates for Two Older Age Groups: Circa 1985 to Circa 1995

(Based on 3-year average of mortality rates centered on 1985 and 1995)



Source: United Nations, various issues of the annual Demographic Yearbook.

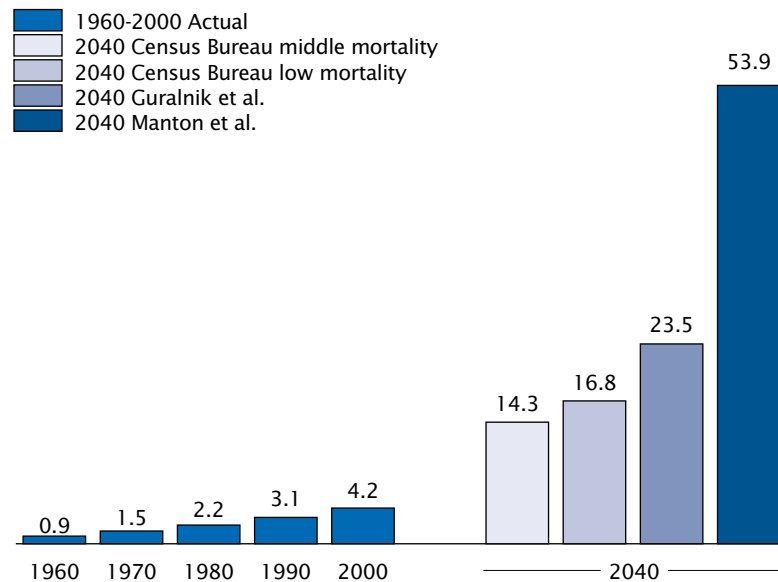
deceleration occurs is rising (Lynch and Brown, 2001).

Findings such as these have generated at least two potential explanations. The "heterogeneity" hypothesis, an extension of the notion of "survival of the fittest," posits that the deceleration in old-age mortality is a result of frailer elderly dying at younger ages, thus creating a very old population with exceptionally healthy attributes resulting from genetic endowment and/or lifestyle. A second, "individual-risk" hypothesis, suggests that the rate of aging

may slow down at very old ages, and/or that certain genes that are detrimental to survival may be suppressed (see Horiuchi and Wilmoth, 1998, for a discussion and examination of these hypotheses). The observed deceleration in mortality, combined with the fact that human mortality at older ages has declined substantially, has led to the questioning of many of the theoretical tenets of aging (Vaupel et al., 1998). Important insights are being garnered from "biodemographic" research which attempts to

Figure 3-8.
Projections of the United States Population Aged 85 and Over

(In millions)



Note: U.S. Census Bureau projections for 2040 do not reflect the results of the 2000 census.
 Sources: Guralnik, Yanagishita, and Schneider, 1988; Manton, Stallard, and Liu, 1993; and U.S. Census Bureau, 1983, 1992, and 2000b.

cross-fertilize the biologic and demographic perspectives of aging and senescence. While a clearer picture of the causes of mortality deceleration at very old ages awaits further investigation (and will benefit from the study of evolutionary biology and aging in nonhuman species; see Olshansky, 1998; Wachter and Finch, 1997; Le Bourg, 2001), its recognition at a time when numbers of the very old are growing rapidly has important policy implications.

PACE OF MORTALITY CHANGE DIFFICULT TO PROJECT

The pace at which death rates at advanced ages decline will play a major role in determining future numbers of elderly and especially of very old population. Vaupel (1997) has noted that the remaining life expectancy of 80-year-old women in

England and Wales is about 50 percent higher today than in 1950. Consequently, the number of female octogenarians is about 50 percent higher than it would have been had oldest-old mortality remained at 1950 levels; in absolute terms, this means that there are more than one-half million oldest-old British women alive today who otherwise would have been dead in the absence of mortality improvement.

An example from the United States illustrates the range of future uncertainty about the size of tomorrow's oldest-old population. The U.S. Census Bureau estimated the number of people aged 85 and over in the United States to be about 3.6 million in 1995 and has made several projections of the future size of this age group (Day, 1996; U.S. Census Bureau, 2000b). The Census Bureau's middle-mortality

series projection suggests that there will be 14.3 million people aged 85 and over in the year 2040, while the low-mortality (i.e., high life expectancy) series implies 16.8 million. As those who will be 85 years old and over in the year 2040 are already at least 40 years old, the differences in these projections result almost exclusively from assumptions about adult mortality rates and are not affected by future birth or infant mortality rates. In the middle-mortality series, the Census Bureau assumes that life expectancy at birth will reach 84.0 years in 2050, while in the low-mortality series life expectancy is assumed to reach 86.1 years in 2050 (Hollmann, Mulder, and Kallen, 2000).

Alternative projections (Figure 3-8), using assumptions of lower death rates and higher life expectancies, have produced even larger estimates of the future population of the United States aged 85 and over. Simply assuming that death rates will continue falling at about the recent 2 percent rate results in a projection of 23.5 million aged 85 and over in 2040 (Guralnik, Yanagishita, and Schneider, 1988). Even more optimistic forecasts of future reductions in death rates have been made from mathematical simulations of potential reductions in known risk factors for chronic disease, morbidity, and mortality. Manton, Stallard, and Liu (1993) used such a method to generate an extreme "upper bound" projection for the United States of 54 million people aged 85 and over in 2040. While such projections are not necessarily the most likely, they do illustrate the potential impact of changes in adult mortality on the future size of the extremely old population.

As noted earlier, researchers are increasingly concerned with overall patterns of mortality decline in addition to studying the pace of decline. One recent study of mortality in the G7¹ countries during the second half of the twentieth century reached a provocative conclusion: mortality at each age has declined exponentially at a fairly constant rate in each country (Tuljapurkar, Li, and Boe, 2000). The possibility of a “universal pattern” of mortality decline raises important questions about the relationship between social expenditures on health and their effect on death rates, and about the likelihood that the mortality decline will be sustained in the future.

THE IMPORTANCE OF CARDIOVASCULAR DISEASE

A major disadvantage of summary mortality indexes such as life expectancy is that they mask changes in mortality by age and/or cause of death. While one can examine life expectancy at different ages, it may be more useful to consider cause-specific changes in mortality, particularly if the intention is to devise medical or nutritional interventions to affect overall longevity and the quality of years lived at older ages. Worldwide, data on cause-specific mortality are far from ideal for policy making in a majority of countries (See Box 3-1). Many developed countries, however, have had reasonably good cause-specific mortality data since at least 1950.

Death rates due to cardiovascular diseases — a broad category that includes heart, cerebrovascular (stroke) and hypertensive diseases —

¹ The G7 countries include Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States.

Box 3-1.

Data on Causes of Death

Statistics on causes of death are prone to many biases and errors in all countries. Underreporting of deaths, lack of precise causal information, inaccurate diagnoses, and cultural differences complicate both national and international studies of mortality. Also, by attributing death to one specific cause, comorbidities and underlying conditions such as anemia and nutritional deficiencies are often masked. Nevertheless, World Health Organization efforts to revise and extend coverage of the International Classification of Diseases produce ongoing improvements in the quality and comparability of data such as those referred to in this report. Although mortality data are imperfect, they can be used to illuminate general patterns and orders of magnitude, and to focus the attention of research, planning, and practice. While decisionmaking should be skeptical of small differences between groups, major differences are likely to indicate underlying disparities and trends.

increase with age but in recent years these rates have declined at older ages in many developed countries. Nevertheless, cardiovascular disease remains the primary killer among elderly populations, more so than for adults in general. For example, more than two-thirds of all deaths to elderly people in Bulgaria and nearly half of all deaths to elderly people in Argentina are attributed to cardiovascular disease, and in most countries the proportion increases with age (Figure 3-9). One comprehensive analysis of developed nations (Murray and Lopez, 1996) attributes nearly 60 percent of all deaths to women aged 60 and over in the early 1990s to cardiovascular disease; the corresponding figure for older men was 50 percent. Cancer deaths at older ages usually rank a distant second, but may be more worrisome in the public eye; in the 1995 Canadian Women’s Health Test, most women believed breast cancer to be the number one killer of women (all ages). Only 16 percent of those surveyed correctly stated that heart disease is the number one killer (Wiesenberg, 1996). The prominence of

cardiovascular disease is not just a developed-country phenomenon; a recent U.S. Institute of Medicine study (Howson et al., 1998) identifies cardiovascular disease as the primary noncommunicable health problem throughout the developing world.

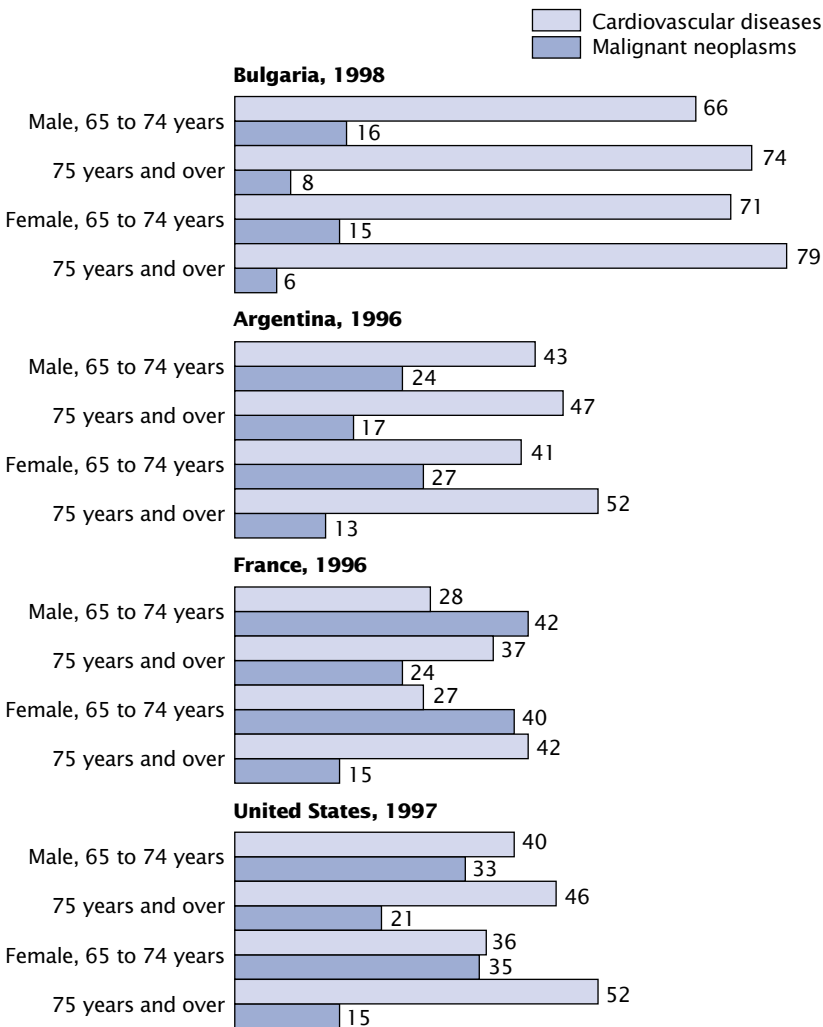
In the United States, the heart-disease component of cardiovascular mortality is the leading cause of death within the elderly population. Among people aged 65 to 74, heart disease and cancers were equally likely to be reported as the major cause of death in 1997, each accounting for about one-third of all deaths in that age group. But as age advances, heart disease claims an increasing share, about 49 percent of deaths to people aged 75 and over (versus 18 percent for cancers). This pattern also occurs in other (but not all) developed countries.

LUNG CANCER RAMPANT SINCE THE 1950s

Although deaths from cardiovascular disease are expected to remain most prominent in the future, a major concern of health practitioners in

Figure 3-9.

Percent of All Deaths From Cardiovascular Diseases and Malignant Neoplasms at Older Ages in Four Countries



Sources: World Health Organization, various issues of World Health Statistics Annual, and www.nt.who.int/whosis/statistics/whsa/whsa_table4.cfm?path=statistics,whsa,whsa_table4&language=english

the industrialized world is the rise in lung cancer among older women as a result of increased tobacco use since World War II. With regard to cancers in general, overall age-standardized death rates for cancer rose 30-50 percent among men during the period 1950-85, and fell by about 10 percent among women. However, such broad trends often are the net result of quite different changes in mortality for the leading sites of disease. In the United States and Western Europe, stomach

cancer has been declining steadily since the 1930s, a decline clearly attributed to nutritional change, i.e., a reduction in salt content of food, especially preserved food (Lopez, 1990).

On the other hand, prevalence of lung cancer has increased since World War II, initially among men but now increasingly among women. Estimates for the early 1990s (Murray and Lopez, 1996) suggest that lung cancer is

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 are virtually identical. 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 are rising rapidly, in proportion to the large increases in cigarette consumption which began several decades ago (Bonita, 1996). Cigarette smoking has been labeled as the single most important preventable cause of premature death in women aged 35 to 69 in both the United States and the United Kingdom (Amos, 1996). Still, breast cancer remains the principal neoplasm site among females, and mortality rates from this source have increased or remained constant in most countries since the post-war period. The rise has been most pronounced in Southern and Eastern Europe, which is consistent with the hypothesis that a diet high in saturated fat is a leading risk factor for breast cancer.

SUICIDE RATES MUCH HIGHER AMONG ELDERLY MEN THAN WOMEN

Suicide rates in 21 countries with relatively reliable data (Table 3-2) are consistently higher among men than women in all age groups, including the elderly. This is a universal trend even in societies as disparate as Singapore, the United States, Israel, and Bulgaria. Suicide rates generally increase with age among men, and are highest at ages 75 and over. Suicide rates for women also tend to rise with age, although the peak rate for women occurs before age 75 in about one

Table 3-2.
Suicide Rates for Selected Age Groups in 23 Countries: Circa 1997

(Rate per 100,000 population in each age group)

Country	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								
Belgium, 1994.....	23	37	43	98	4	17	17	20
Bulgaria, 1998.....	15	27	48	116	6	9	20	50
Denmark, 1996.....	13	31	35	71	2	17	16	20
Finland, 1996.....	34	55	50	48	7	18	14	7
France, 1996.....	13	38	41	87	4	16	15	20
Germany, 1997.....	13	30	32	71	3	10	13	21
Hungary, 1998.....	18	93	80	131	4	20	24	50
Ireland, 1996.....	25	19	12	22	5	6	1	2
Italy, 1995.....	7	14	23	43	2	5	7	8
Netherlands, 1997.....	11	16	16	34	4	8	9	12
Norway, 1995.....	23	24	32	24	6	10	10	5
Poland, 1996.....	17	42	31	31	3	8	7	6
Portugal, 1998.....	4	7	20	39	1	3	7	9
Russia, 1997.....	53	100	97	97	9	15	20	33
Switzerland, 1996.....	25	37	47	80	6	16	17	24
United Kingdom, 1997.....	10	14	9	17	2	4	4	4
North America								
Canada, 1997.....	22	27	21	27	5	9	5	4
United States, 1997.....	19	23	26	45	4	7	5	5
Other								
Australia, 1995.....	23	22	19	27	6	8	5	5
Chile, 1994.....	11	14	20	27	2	2	2	1
Israel, 1996.....	9	9	18	41	2	4	4	15
Japan, 1997.....	11	40	35	53	6	14	19	33
Singapore, 1997.....	9	18	30	74	9	9	14	33

Sources: World Health Organization, various issues of World Health Statistics Annual, and www.nt.who.int/whosis/statistics/whsa/whsa_table4.cfm?path=statistics,whsa,whsa_table4&language=english

third of the countries in Table 3-2. The fact that the average woman outlives her spouse — coupled with studies that show that married elders are happier than nonmarried elders — might lead one to predict that older women would have higher rates of suicide than older men, but this is clearly not the case.

Among the 23 countries examined, Hungary and Russia had the highest suicide rates for elderly men, and Hungary and Bulgaria had the highest rates for elderly women. The reported Hungarian rate for men aged 75 and over is five to seven times higher than similar rates in Ireland, the United Kingdom, and Norway. Belgium and France have comparatively high rates among

their elderly male populations, while Japan, Switzerland, and Russia have comparatively high rates among elderly women. Levels for elderly 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 differentials may be artificial due to differences in the reporting and/or diagnosis of suicide, their sheer magnitude suggests that real international differences do exist and deserve closer study.

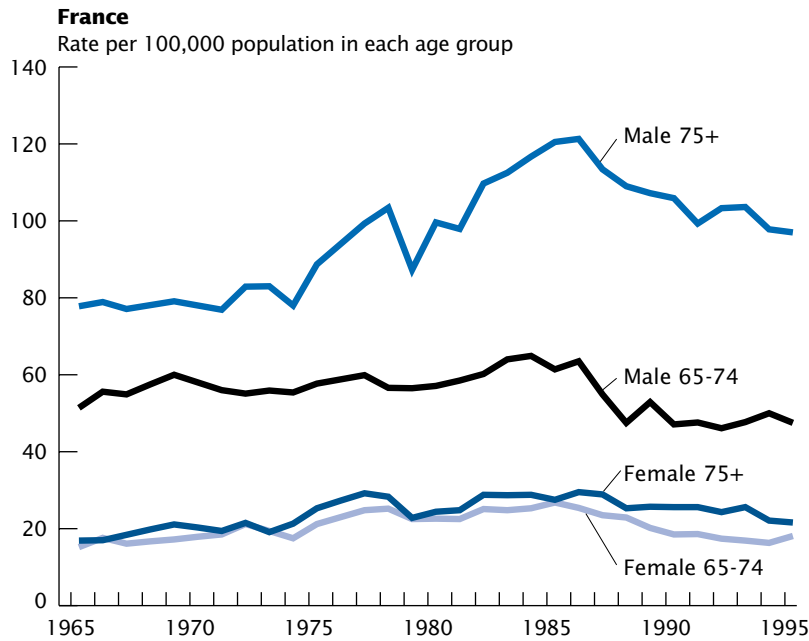
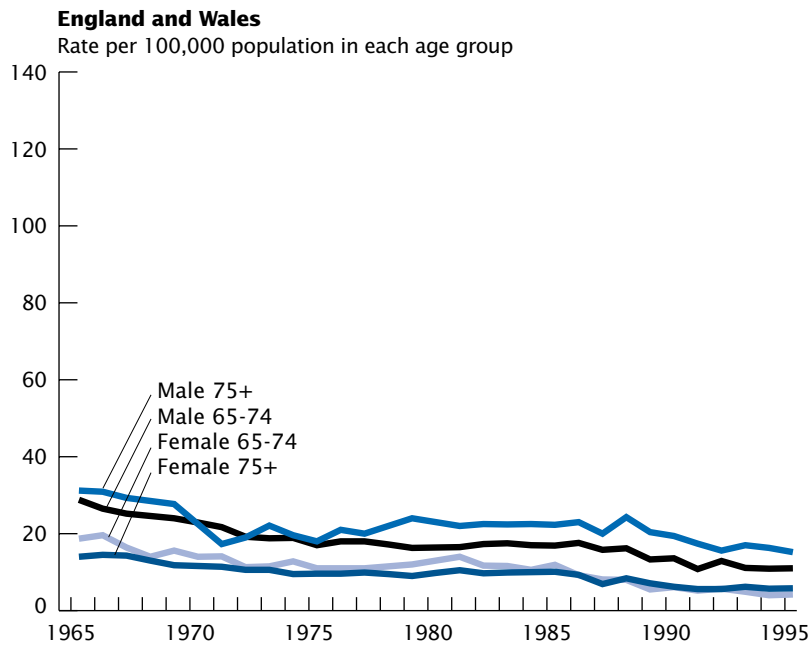
NO CLEAR TIME TREND IN ELDERLY SUICIDE WORLDWIDE

Data from the World Health Organization for the past 30 years do not show any clear trend in

elderly suicide rates 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 England and Wales (Figure 3-10). More often, national rates have fluctuated with no perceptible pattern.

There was a downward trend in elderly suicide in the United States for nearly half a century prior to 1980. From 1981 to 1988, however, the suicide rate of older Americans rose about 25 percent before beginning to decline in the 1990s. Such an increase raised questions at a time when older people were living longer and were supposedly healthier and more financially secure

Figure 3-10.
**Suicide Rates by Age in England and Wales
 and in France: 1965 to 1995**



Source: World Health Organization, various issues of World Health Statistics Annual.

(Robinson 1990). Likewise in Japan, a 30-year decline in elderly suicide appeared to level off in the 1980s, though more recent data show a significant decline in the 1990s. However, social scientists remain puzzled by the relatively high rates of suicide among elderly Japanese women. 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 the elderly, and have not changed greatly during the past 30 years.

CHAPTER 4.

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 commonly dubbed the “demographic transition.” Related to this trend is the “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 classic demographic transition, 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. As fertility declines and populations begin to age, the preeminent causes of death shift from those associated with childhood mortality to those associated with older age (Kalache, 1996). Eventually, growing numbers of adults shift national morbidity profiles toward a greater incidence of chronic and degenerative diseases (Frenk et al., 1989).

EPIDEMIOLOGIC TRANSITION SHIFTS SURVIVAL CURVE

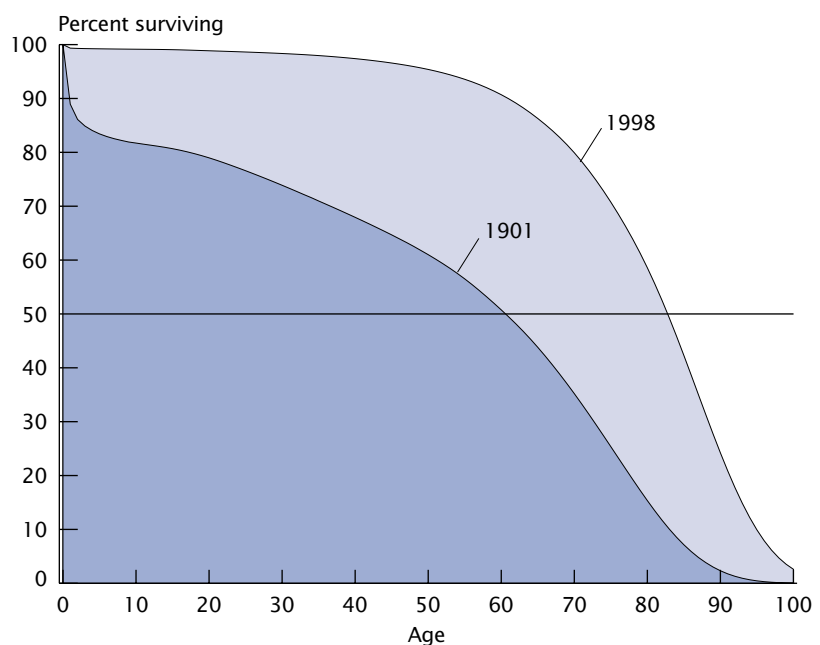
Figure 4-1, which shows survival curves for U.S. females in 1901 and 1998, illustrates a general pattern seen in developed countries. The curve for 1901 represents the early stages of the epidemiologic transition in which the level of infant mortality was high, there was considerable mortality through the middle years, and a gradual increase at the later ages. Female life

expectancy at birth was approximately 50 years, and the median age at death (the age to which 50 percent of females subject to the mortality risks of 1901 could expect to survive) was about 60 years. By 1998, the survivorship curve had shifted dramatically. Female life expectancy had risen to 79 years, and the median age at death was above 80 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 much more rectangular shape as a result of relatively more chronic-disease mortality at older ages.

DEVELOPING-COUNTRY TRANSITION APPEARS GREATEST IN LATIN AMERICA

Developing countries are in various stages of epidemiologic transition. Change is most evident in Latin America and the Caribbean, where cardiovascular diseases were the leading cause of death in 29 of 33 countries examined in 1990 (PAHO, 1994). Most deaths from chronic and degenerative ailments occur at relatively old ages. Comparative data from the mid-1990s (Figure 4-2) show that half or more of all deaths in numerous nations of the Western Hemisphere now occur at ages 65 and over.

Figure 4-1.
Survival Curve for U.S. Females: 1901 and 1998



Note: Data for 1901 refer to White females.
Sources: U.S. Census Bureau, 1936; U.S. Centers for Disease Control, 2001.

The pace of epidemiologic change in East and Southeast Asian nations is now 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 to 32 percent of all deaths, while deaths due to infectious diseases declined from 40 to 12 percent. Data from Taiwan (Table 4-1) 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 the 1996 was similar to that in 1976, except that the relative importance of diabetes had risen substantially while tuberculosis was no longer a major killer. Although reliable 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.

DOES LONGER LIFE EQUAL BETTER LIFE?

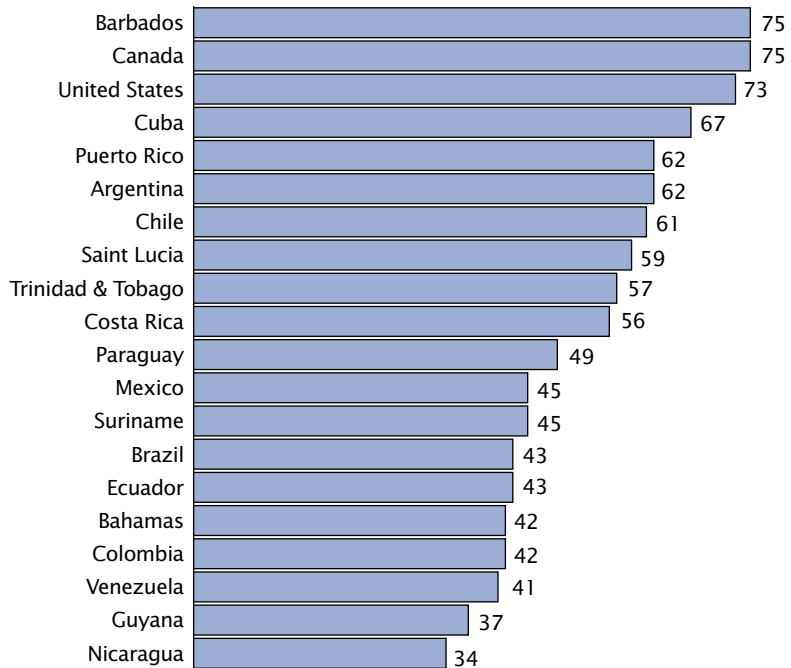
Chapter 3 pointed out that continual increases in life expectancy, especially at older ages, have been the norm in most countries worldwide. As individuals live longer, the quality of that longer life becomes a central issue for both personal and social well-being. Are we living healthier¹ as well as longer lives, or

¹ "Health" is a relative and continually developing concept which "reflects on the one hand the progress made within the health sciences and on the other hand the meanings, values and prejudices related to health in different sociocultural contexts." (Heikkinen 1998; see this source for a useful discussion of the different orientations toward health that have been adopted in the health sciences).

are we spending an increasing portion of our older years with disabilities, mental disorders, and in ill health? In aging societies, the answer to this question will have a

profound impact on national health, retirement, and family systems, and particularly on the demand for long-term care. In the future, health expectancy will come to be as

Figure 4-2.
Proportion of All Deaths Occurring at Ages 65 and Above in 20 Countries: Circa 1995
(Percent)



Source: Pan American Health Organization, 1998.

Table 4-1.
Rank Order of the Ten Leading Causes of Death in Taiwan: 1956, 1976, and 1996

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

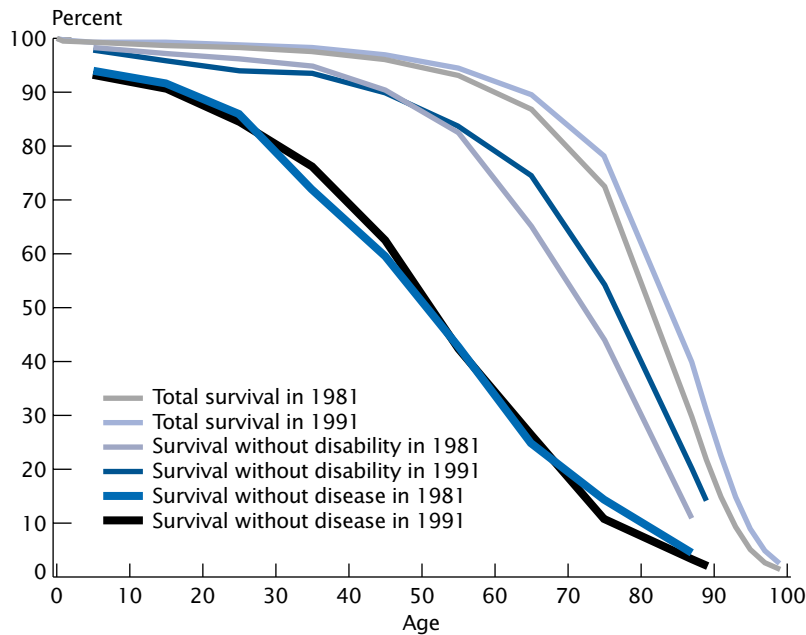
¹Includes gastritis, duodenitis, enteritis, and colitis (except diarrhoea of newborns).

²CNS refers to the central nervous system.

³Includes emphysema and asthma.

Source: Taiwan Department of Health, 1997.

Figure 4-3.
Survival Without Disease and Survival Without Disability for French Females: 1981 and 1991



Source: Robine, Mormiche, and Cambois, 1996.

important a measure as life expectancy is today.

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) notes that in Japan, the United States, and Britain, mortality decreased and sickness (morbidity) increased, while in Hungary, mortality increased and sickness decreased.² Discrepancies between the trends in mortality, morbidity, and disability have

² 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 death and health risks has been unstable rather than stable across time. The risk of being sick has increased as a result of various obvious and non-obvious factors — among them earlier and better detection of sickness, declining mortality, and rising real income — which themselves constitute valuable human achievements. The implication is that protracted sickness is a byproduct of such achievements.

generated competing theories of health change, several of which may be characterized as: a pandemic of chronic disease and disability (Gruenberg, 1977; Kramer, 1980); a compression of morbidity (Fries, 1990); dynamic equilibrium (Manton, 1982); and the postponement of all morbid events to older 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 disabling chronic disease. In other words, it is desirable to quantitatively 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 4-1 can be partitioned into different categories that indicate overall survival, survival without disability, and survival without disease.

An application of this model to data from France (Robine, Mormiche, and Cambois, 1996) shows that the increase in total survival between 1981 and 1991 was generally consistent with the increase in disability-free life expectancy, whereas survival without chronic disease showed little change (Figure 4-3). In this case, the differing trajectories of disability and morbidity may be interpreted as support for the theory of dynamic equilibrium, which says that increases in overall life expectancy are driven in part by a reduction in the rate of progression of chronic diseases.

HEALTHY LIFE EXPECTANCY

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. As of 1998, 49 nations had estimates of healthy life expectancy,³ an indicator that attempts to integrate into a single index the mortality and morbidity conditions of a population. Most estimates of healthy life expectancy are derived from calculations of disability-free life expectancy using a methodology pioneered by Sullivan (1971), which 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

³ The concept of healthy life expectancy as typically used refers to expectancy without limitations of function that may be the consequence of one or more chronic disease conditions. The concept is sometimes called "active life expectancy" or "disability-free life expectancy," to avoid the implication that "healthy" means "absence of disease."

rehabilitation into the calculations (see, e.g., Manton and Stallard, 1988; Rogers, Rogers, and Belanger, 1990). These latter models, however, require longitudinal data which currently are unavailable in most nations. To date, chronological series are available only for some developed nations.

In recent years, researchers have been working toward developing integrated, comparable measures of healthy life expectancy (Verbrugge, 1997). Presently, however, it remains impossible to strictly compare estimates among nations, due both to different computational methods and, more importantly, to differences in concepts and definitions that define the basic data. There are important but not-widely-appreciated distinctions between impairments, disabilities, and handicaps that can lead to different measures of health status (Chamie, 1989). Because “disability” is defined in many ways, national estimates of disability vary enormously. For example, a compilation by the United Nations (1990a) showed national crude disability rates for the total population ranging from less than half a percent in several developing countries (Peru, Egypt, Pakistan, Sri Lanka) to nearly 21 percent in Austria. Perhaps the most commonly-used measurement tools are scales which 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

Box 4-1.

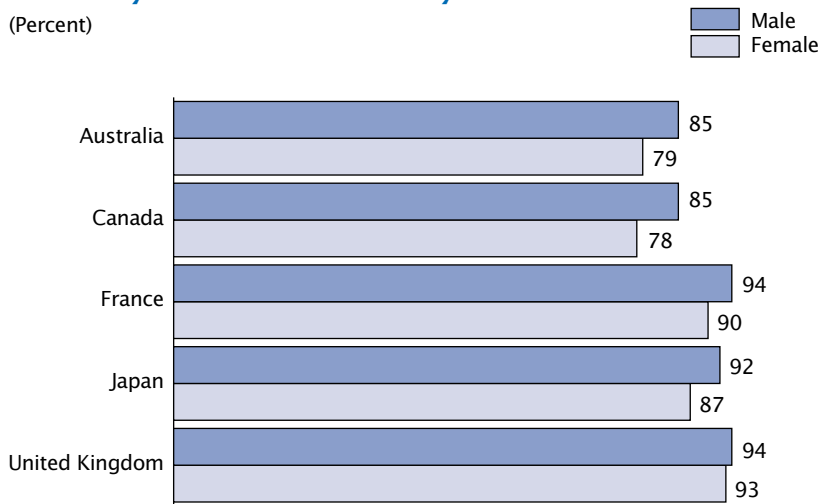
Network on Health Expectancy

To facilitate and promote analyses of health expectancy, an international network (REVES, the French acronym for Network on Health Expectancy and Disability Process) was formed in 1989 to bring together researchers concerned with the measurement of changes and inequalities in health status, not only within but among nations. REVES has produced numerous documents and bibliographies of relevant materials, including a statistical yearbook that includes existing estimates of health expectancy in various countries. Further information may be obtained from Jean-Marie Robine, Network Coordinator, INSERM Equipe Demographie et Sante, Centre Val d’Aurelle, 34298 Montpellier Cedex 5, France.

Figure 4-4.

Portion of Old Age Lived Without Severe Disability: Data From the Early 1990s

(Percent)



Note: Figures refer to the percent of a person's life, after reaching age 65, that she or he might expect to live without needing significant help (personal care) with at least one major activity of daily living. Source: Jacobzone, 1999.

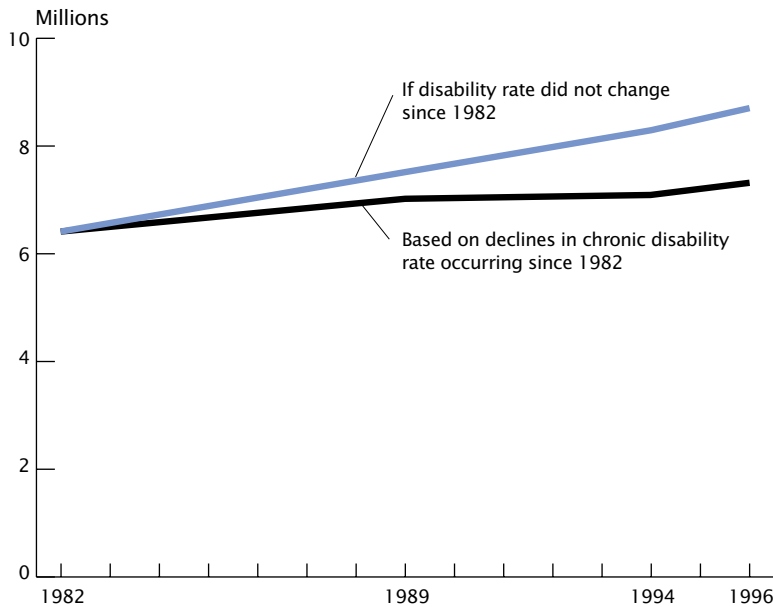
and individuals’ ability to function in everyday life.⁴

⁴ 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. And, of course, there are many questions regarding the validity and applicability of such measures in different cultural settings.

FEMALE ADVANTAGE IN LIFE EXPECTANCY PARTIALLY OFFSET BY DISABILITY

In spite of cross-national comparability problems, several general observations seem warranted. For individuals reaching age 65, health expectancy varies more than remaining life expectancy. One examination (Kinsella and Taeuber, 1993) of REVES data (See Box 4-1) showed that the range of life expectancy at age 65 varied by about 12 percent among developed

Figure 4-5.
Number of Chronically Disabled People Aged 65 and Over in the United States: 1982 to 1996



Source: Manton, Corder, and Stallard, 1997.

countries for both men and women. However, the percent of this time spent in “good health” (free of problems with personal and instrumental activities of daily living) had a much wider range, from 45 to more than 80 for males, and from 37 to 76 for females (these figures exclude apparent outlier estimates which would widen the ranges even further). For men in developing countries, the estimated range of remaining life expectancy at age 65 was 12 to 15 years. However, the estimated percent of remaining years spent in relative health varied from less than 60 to 88 percent. For elderly women, the variation in life expectancy was 28 percent, while the range of healthy remaining life was 50 to 87 percent.

Available but geographically limited data from the early 1990s suggest a further tentative statement: women reaching age 65 can expect to

spend a slightly greater proportion of their remaining years in a severely disabled state relative to elderly men, thus negating some of the potential benefit of their higher life expectancy (Figure 4-4). Other studies of gender differences in the incidence of disabling conditions at older ages support this contention (Heikkinen, Jokela, and Jylha, 1996; Dunlop, Hughes, and Manheim, 1997; Robine and Romieu, 1998).

DEVELOPED-COUNTRY DISABILITY RATES AT OLDER AGE SEEN TO BE DECLINING

In nations where time series estimates of health expectancy are available (e.g., Canada, the United States, Australia, England/Wales), the general view in the 1980s was one of uncertainty regarding the relationship between rising life expectancies and trends in health expectancies. One comprehensive review of data in the United States

(Freedman and Soldo, 1994) found declines in less-severe disability (i.e., in IADLs) during the 1980s. Data from Australia, on the other hand, revealed that the increase in years of disability between 1981 and 1988 was greater than the overall increase in life expectancy. Data for Canada and Finland suggest that changes in disability-free life expectancy have been and remain stagnant (Robine and Romieu, 1998). Researchers posited a number of potential factors — other than actual increases in chronic disease incidence and measurement error — which might have contributed to stagnation or declines in healthy life expectancy, including increased survival of chronically ill individuals due to improvements in medical care, earlier diagnosis or treatment 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 (Mathers, 1991; Verbrugge, 1989).

More recent data and rigorous analyses, however, now strongly suggest that rates of disability in a number of developed countries are declining. In the United States, researchers (Manton, Corder, and Stallard, 1997) used data from the 1982, 1984, 1989 and 1994 rounds of the U.S. National Long Term Care Survey to demonstrate that the disability rate among people aged 65 and over declined over the 12-year period, such that there were 1.2 million fewer disabled older people in 1994 than would have been the case if the 1982 rate had not changed (Figure 4-5). Five other U.S. surveys, while varying in content and nature

(e.g., both longitudinal and cross-sectional), have yielded findings that support a temporal decline. Likewise, a U.S. study of changes between 1982 and 1993 in self-reported ability to work found significant improvement among both men and women who were in their sixties (Crimmins, Reynolds, and Saito, 1999). Another U.S. study (Freedman and Martin, 1998) of the effect of changes in living environments, device use, and survey design on functional ability among noninstitutionalized people aged 50 and over concludes that these changes alone could not account completely for improved functioning, and that there has indeed been some improvement in underlying physiological capability. Increased levels of education have been identified as a potentially powerful factor influencing disability decline in the United States.

A review of trend data from nine other developed countries plus Taiwan concludes that, with a few exceptions by gender, disability is declining among the elderly elsewhere as well (Waidmann and Manton, 1998), as indicated by the French data in Figure 4-3. Researchers increasingly have disaggregated disability into more-severe versus less-severe categories, and the current consensus in developed countries is that the overall decline in disability is primarily the result of decreases in the more-severe forms (Robine and Romieu, 1998). Freedman, Aykan, and Martin (2001), for example, have recently demonstrated a decline between 1993 and 1998 in severe cognitive impairment among the noninstitutionalized population aged 80 and over in the United States. Such trends, if sustained,

obviously have substantial implications for public and private health programs and expenditures, and possibly for the conceptualization and definition of disability itself.⁵

Many countries with aging populations now recognize the need for longitudinal surveys as a means of understanding adult health patterns, transitions to and from different health statuses, and how to differentiate between morbidity and aging per se (Svanborg, 1996). While such survey efforts involve substantial economic investment, the potential cost savings in policy design and implementation would seem to dwarf the initial expense. And as various national longitudinal analyses expand, both geographically and in terms of specific disabling conditions, all health systems stand to benefit from more comprehensive comparisons and the resultant implications for program priorities.

DEVELOPING-COUNTRY DISABILITY BURDEN LIKELY TO INCREASE AS POPULATIONS AGE

Two decades ago, the World Health Organization noted a distinction in prominent causes of disability between developed and developing countries. In the latter, disability was said to stem primarily from malnutrition, communicable diseases, accidents, and congenital conditions. In industrialized countries disability resulted largely from the chronic diseases discussed earlier — cardiovascular disease, arthritis, mental illness, and metabolic disorders, as well as

⁵ For a description of changes and paradigm shifts in disability policy in certain developed countries, see Kalisch, Aman, and Buchele, 1998.

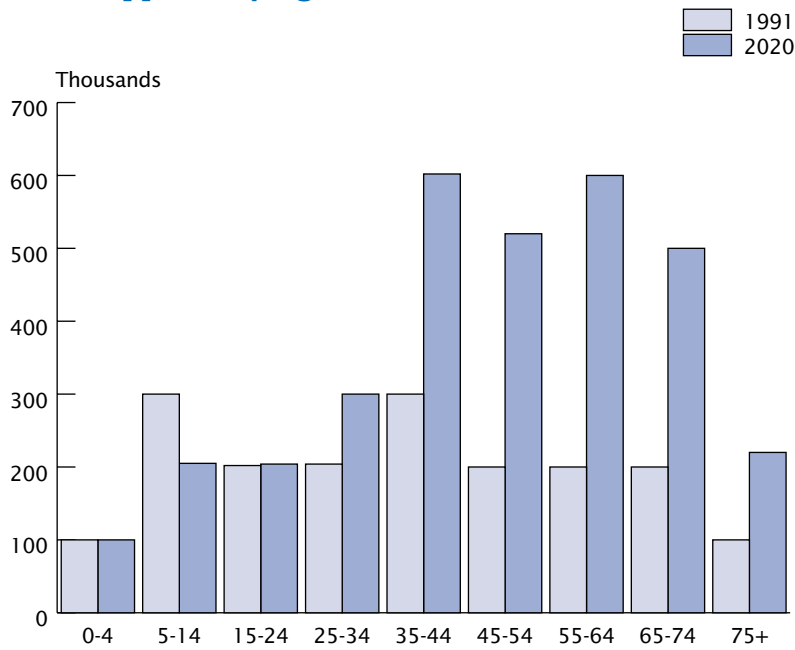
accidents and the consequences of drug and alcohol abuse. As economies in developing countries expand and the demographic and epidemiologic pictures change, we might expect to see related changes in the nature and prevalence of various disabilities.

Numbers of disabled people are almost certain to increase as a correlate of sheer population growth. Figure 4-6 illustrates the application of empirical gross disability rates to the projected population of the Philippines. This simplistic example assumes that disability rates for men and women as measured in 1980 will remain constant in the future. Even with no provision for higher rates of disability as the population ages, the projected absolute increases are alarming in terms of future service and care requirements.

ESTIMATING THE BURDEN OF DISEASE

A major ongoing effort to understand and predict the effect of epidemiologic change is the Global Burden of Disease Project undertaken jointly by the World Health Organization, Harvard University, and the World Bank. Using a computational (and controversial; see, e.g., Black and McLarty, 1996; Cohen, 2000) concept known as Disability-Adjusted Life Years (DALYs), this study attempts to measure global, regional, and country-specific disease burdens in a baseline year, and to project such burdens into the future. Figure 4-7 highlights the change in the estimated (1990) and projected (2020) rank order of disease burden for the ten leading disease categories on a global basis. In addition to underscoring the expected shift

Figure 4-6.
Projected Numbers of Disabled Males in the Philippines by Age: 1991 and 2020



Sources: United Nations, 1990 and U.S. Census Bureau, 2000a.

Figure 4-7.
Change in Rank Order of Disease Burden for Top Ten Leading Causes in the World: 1990 and 2020

(Disease burden measured in disability-adjusted life years)

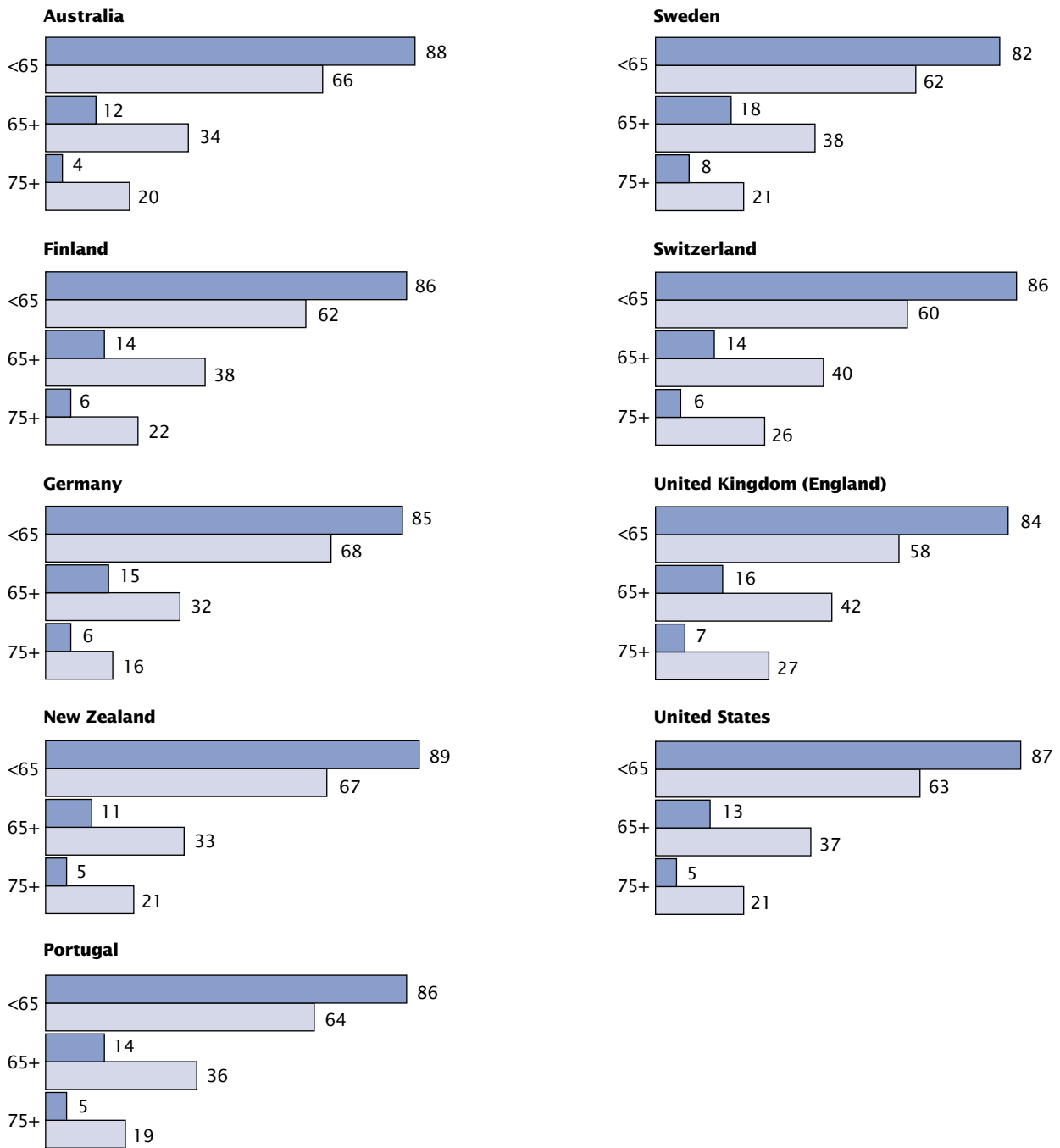
	1990	2020
Rank	Disease or injury	Disease or injury
1	Lower respiratory infections	Ischemic heart disease
2	Diarrhoeal diseases	Unipolar major depression
3	Conditions arising during the perinatal period	Road traffic accidents
4	Unipolar major depression	Cerebrovascular disease
5	Ischemic heart disease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

Source: Murray and Lopez, 1996.

from communicable to non-communicable disease patterns (largely driven by the changing situation in developing countries; Murray and Lopez, 1997), this study raises specific warning flags for many countries in terms of a likely increase in disease burden due to neuro-psychiatric conditions and accidents. Among the many results, several stand out: (1) the projected prominence of tobacco use vis-a-vis mortality (as mentioned in Chapter 3) and through various disease vectors, with the expectation that tobacco will kill more people than any single disease by 2020; (2) the concentration of disease burden in certain developing regions. For example, the inhabitants of India and Sub-Saharan Africa were estimated to bear more than 40 percent of the world's disease burden in 1990, while constituting only one-fourth of the world's population. The study also points out the fallacy that noncommunicable diseases are necessarily related to affluence; the likelihood of dying from a non-communicable disease among adults under age 70 in both India and Sub-Saharan Africa is greater than in Western Europe; and (3) the vastly underestimated importance of mental illnesses as major and increasing sources of disease burden, which implies significant long-term care challenges in aging societies (Murray and Lopez, 1996).

Figure 4-8.
**Share of Population Versus Health Expenditure
 by Age in Nine Countries: 1993**

Percent of total
 ■ Population
 ■ Health expenditure



Source: OECD, 1997.

AGING INCREASES HEALTH CARE COSTS

Population aging might be expected to increase costs of health care in most societies because health expenditures by and for older age groups tend to be proportionally greater than their population share (Figure 4-8). This expectation applies especially to nations where acute care and institutional (long-term care) services are widely available. Cross-national comparative data on health care expenditures by age are relatively uncommon, but ongoing work by the Organization for Economic Co-Operation and Development has begun to document age-specific differentials. Table 4-2 shows that per capita health expenditures for people aged 65 and over are uniformly higher than for the nonelderly, and that this difference varies by country. Much of the between-country difference may be attributed to variations in program coverage. In nations where relatively little long-term care

is included in public health schemes (e.g., Germany), per capita expenditures for people aged 65 and over may be two to three times higher than those for younger people; in countries with more inclusive long-term care coverage (e.g., Australia and Finland), the ratio is four times higher (OECD, 1997).

Although the picture of rising health care costs with age is accurate in a general sense, disaggregation of data by age shows some surprising facets. A large fraction of health care costs associated with advancing age is incurred in the period just prior to death, and since an increasing proportion of people are living to very old age, overall health care costs rise with age. Treatments to prolong life have made once-certain death much less certain, but there is some indication that health care costs taper off at very old ages (OECD, 1998b), suggesting that life may be prolonged up to a point but that treatment is not desired indefinitely. Likewise,

among noninstitutionalized elderly, per capita health expenditure often peaks at ages 75 to 79 and declines thereafter. Costs per service (such as hospital stays and medicine prescriptions) for older people are less than for the population as a whole, although usage rates for older people are much higher and hence the per capita costs are higher (OECD, 1997). Governments and international organizations are now recognizing 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), and in part to understand the potentially salubrious effects that may accrue to future generations due to higher levels of education and access to information about healthier lifestyle behaviors.

EARLY-LIFE CONDITIONS AFFECT ADULT HEALTH

The last decade has seen a rapidly growing interest in examining adult health outcomes from a life-course perspective. Researchers increasingly suggest that many negative health conditions in adulthood stem from risks established early in life (Elo and Preston, 1992). Some (notably, Barker, 1995) argue that adult health has a fetal origin, wherein nourishment in utero and during infancy has a direct bearing on the development of risk factors for adulthood diseases (especially cardiovascular diseases). Childhood infections may have long-term effects on adult mortality. A World Health Organization report states unequivocally that 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, 1998), as do certain

Table 4-2.
Relative Per Capita Health Expenditure by Age Group in 12 Countries: Circa 1993

(0-64 = 1.0)

Country	65-74	65+	75+
Australia	2.8	4.0	6.0
Finland.....	2.8	4.0	5.5
France	¹ 2.2	² 3.0	³ 3.7
Germany	2.3	2.7	3.2
Japan.....	⁴ 3.1	4.8	⁵ 5.7
Netherlands	(NA)	4.4	(NA)
New Zealand	2.3	3.9	6.2
Portugal.....	1.4	1.7	2.1
Sweden	2.3	2.8	3.4
Switzerland.....	2.6	4.0	5.7
United Kingdom (England)...	2.5	3.9	5.6
United States	3.1	4.2	5.2

NA Not available.

¹Refers to ages 60-69.

²Refers to ages 60+.

³Refers to ages 70+.

⁴Refers to ages 65-69.

Note: Data are relative to the level of per capita spending for people aged 0-64, which is set at 1.0.

Source: OECD, 1997.

parental behaviors (particularly smoking and alcohol consumption) and socioeconomic circumstances (e.g., poverty). Parental divorce has been linked to decreased longevity of children (Schwartz et al., 1995).

While it seems intuitive that childhood conditions should affect adult development and health outcomes, separating cohort effects from period effects (e.g., from changing living conditions) is empirically difficult. Indeed, some evidence suggests that current conditions may be more important than early-life conditions; Kannisto (1996) has found period effects to be much more significant than cohort effects on oldest-old mortality (i.e., after age 80). And in a study of cohorts born just before, during, and just after a severe famine in Finland in the mid-1860s, the researchers found no major differences in later-life survival; the extreme nutritional deprivation in utero and during infancy appeared not to translate into higher adult mortality risks (Kannisto, Christensen, and Vaupel, 1997). Such findings are likely to stimulate considerable future research to explore the linkages between lingering effects of early-life and survival at advanced ages (Vaupel, 1997).

SOCIOECONOMIC CORRELATES OF MORTALITY AND HEALTH

If early-life factors affect future health and survival, then socioeconomic differences in childhood and throughout life are likely to play an intrinsic role. A diverse and long-standing literature from the

industrialized world⁶ has identified a number of socioeconomic factors that affect health and longevity: people with higher education tend to live longer (Kitigawa and Hauser, 1973); being married encourages healthier behaviors in U.S. adults, including people in old age (relative to other marital statuses), and the effects may be greater for older men than for older women (Schone and Weinick, 1998); there are clear gradients in the United Kingdom in both mortality and health when broken down by social class, i.e., higher social/occupational class is related to better health and lowered mortality risks (Devis, 1993; Wilkinson and Marmot, 1998); and among the oldest old in Sweden, former white-collar workers had better physical functioning than former blue-collar workers (Parker, Thorslund, and Lundberg, 1994). In the United States (Crimmins, Hayward, and Saito, 1996) and in several European countries (Robine and Romieu, 1998), socioeconomic conditions more strongly affect functional change than mortality, which means that socioeconomic differences in active or healthy life expectancy are greater than those in total life expectancy. Such findings might be expected to have implications for the future health status of elderly populations. For

⁶ Research on socioeconomic correlates of mortality and health in developing countries is still sparse. Wu and Rudkin (2000) found that lower socioeconomic status was associated with poorer health among Malaysians aged 50 and over, and that this association held for all three major ethnic groups (Malay, Chinese, and Indian). Liang et al. (2000) have found evidence of a socioeconomic gradient in old-age mortality in China, but they note that there are major differences between developed and developing countries in terms of major health parameters, and that much more work needs to be done in validating gradients in Third World settings.

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 social but also psychological and biological pathways by which socioeconomic status affects health (see, e.g., Adler et al., 1999).

While the weight of existing studies clearly supports a strong relationship between social and economic factors on the one hand and health and mortality outcomes on the other, this relationship may not be as strictly predictive as some have suggested. Research on marital status and health among the elderly in the United States, for instance, has shown that while widowhood is in fact associated with poorer health, single women are likely to have better health outcomes than married women (Goldman, Korenman, and Weinstein, 1994). One Japanese study (Sugisawa, Liang, and Liu, 1994) found no significant effect of marital status on the risk of dying; however, higher levels of social participation of older people were strongly linked to lowered mortality risks. Research in Florence, Italy and Tampere, Finland uncovered no systematic association between functional ability levels and education/previous occupation (Heikkinen, Jokela, and Jylha, 1996). In a study of nine industrialized nations, differences in mortality by educational level were found to be fairly small in the Netherlands and three Scandinavian nations, but

much more substantial in larger countries such as the United States, France, and Italy. The authors suggest that between-country differences may be related to different social and economic policies. A 12-country study of occupational class and ischemic heart disease mortality found the expected relationship between lower class and

higher mortality in Northern European countries, but no such relationship in France, Switzerland, and Mediterranean nations (Kunst et al., 1999). Another multicountry study of income and mortality implies that the effect of income on mortality is largely determined by the distribution of income within a given nation (Duleep, 1995). Such

results point to the importance of understanding population diversity within countries, and suggest that policy planners pay particular attention to socioeconomic differences by gender and among subgroups when developing intervention strategies (see Sacker et al., 2001 and National Research Council, 2001 for further discussion).

CHAPTER 5.

Urban and Rural Dimensions

Urbanization is one of the most significant population trends of the last 50 years. Though we may think of cities as synonymous with historical development, not until the nineteenth century did substantial portions of national populations live and work in large cities, and only in certain parts of the world. In 1900, about 14 percent of the world's population lived in cities (United Nations, 1991), and this percentage was still below 20 by 1950. However, the global population of all ages living in urban areas (as defined by each country) more than doubled between 1950 and 1975, and increased another 55 percent from 1975 to 1990. By 1995, about 46 percent (2.6 billion) of the earth's people lived in urban areas (United Nations, 1998). Soon after the year 2000, the world likely will have more urban dwellers than rural dwellers. About three-fourths of the population in developed countries is urban, compared with slightly more than one-third in developing countries as a whole. However, the pace of urbanization is much faster in the developing world. And while the urban growth rate in most world regions has begun to decline, some parts of the globe (notably Africa and South Asia) are now experiencing peak rates of urban growth. In spite of declining growth rates, the world's urban population is projected to virtually double between 1995 and 2030, reaching a projected level of 5.1 billion people (United Nations, 1998).

Twentieth-century trends in urbanization have stemmed from broad

economic and political changes. Closed national economies and trading blocs have given way to open economies that increasingly are international in scope. In general, the most rapidly-growing economies since 1950 also are those with the most rapid increase in their levels of urbanization. The world's largest cities tend to be concentrated in the world's largest economies (United Nations Centre for Human Settlements, 1996). Urbanization is linked to changes in the socioeconomic profile of a workforce as workers shift from predominantly agricultural pursuits to industrial employment and then to services. Clark and Anker (1990) have shown that urbanization is related to decreased participation of older people in the labor force. In developed countries, this decrease accompanies a decline in manufacturing employment, an increased prevalence of early retirement schemes, and lower levels of education and job flexibility among older workers relative to younger workers. In urban areas of developing nations, the increased importance of the formal sector tends to exclude older workers who find it difficult to compete with better-educated younger workers. With urbanization come changes in the family unit and kinship networks that have both beneficial and adverse consequences for the well-being of elderly members.

Urban growth affects all age groups of a population. Since urbanization often is driven by youthful migration from rural areas to cities, it influences the age distribution in

both sending and receiving areas. Definitions of urban and rural residence often differ greatly from one country to the next, which complicates global and regional discussions of urbanization. The view of the United Nations has been that "differences in definition may reflect differences in the characteristic features of urban and rural settlements considered most relevant in individual countries" (United Nations, 1973). In spite of definitional inconsistencies, the basic questions concerning aging are similar in all societies: are the elderly increasingly concentrated in particular areas? If so, what are the implications for social support and delivery of services? For individual cities, do changes in age structure bring about demands to reorder budget priorities?

DEVELOPED-COUNTRY ELDERLY ABOUT THREE-FOURTHS URBAN; ONE-THIRD IN DEVELOPING COUNTRIES

In keeping with the worldwide pattern of increased urbanization, the elderly population has become more concentrated in urban areas during the past 50 years. In developed countries as a whole, an estimated 73 percent of people aged 65 and over lived in urban areas in 1990, and this figure is projected to reach 80 percent by the year 2015. In developing nations, which still are predominantly rural, just over one-third (34 percent) of people aged 65 and over were estimated to live in urban areas in 1990. This proportion is expected to exceed one-half by the year 2015 (United Nations, 1991).

The elderly of Africa are more likely to live in rural areas than are the elderly of other regions, even though the African population overall is slightly more urbanized than that of the Asia/Oceania region (excluding Japan). The aggregate trend toward urbanization is stronger in Asia than in Africa, however. Half of the Asia/Oceania elderly are projected to live in cities by 2015, compared with 42 percent in Africa.

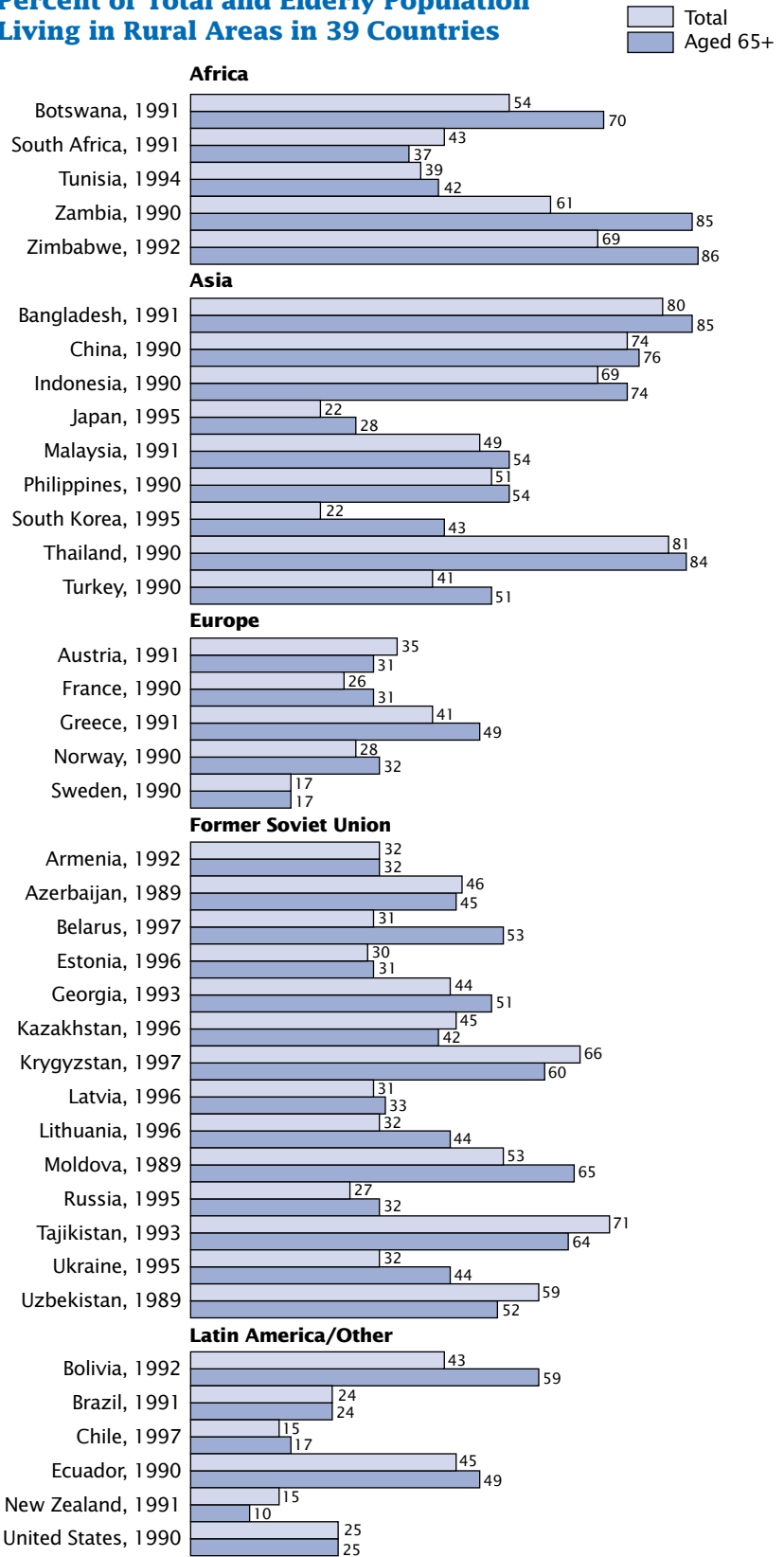
As a region, Latin America and the Caribbean is already highly urbanized. The proportion of elderly in urban locales is very similar to that of the developed-country average. Unlike in other developing areas, the elderly in Latin America and the Caribbean have been somewhat more likely than the general population to live in cities (Heligman, Chen, and Babakol, 1993).

ELDERLY MORE LIKELY THAN NONELDERLY TO LIVE IN RURAL AREAS

Despite the increasingly urban nature of today's elderly populations, rural areas remain disproportionately elderly in a majority of countries. In most nations, this is primarily the result of the migration of young adults to urban areas, and to some extent of return migration of older adults from urban areas back to rural homes. Data for 39 countries from the period 1989 to 1997 show that the percent of all elderly living in rural areas was higher than the percent of total population in rural areas in 27 of the 39 nations, with no difference in 4 nations (Figure 5-1). Five of the eight countries where the elderly were less likely than the total population to live in rural areas are predominantly-Muslim nations that were formerly part of the Soviet Union. Differences in the share of

Figure 5-1.

Percent of Total and Elderly Population Living in Rural Areas in 39 Countries

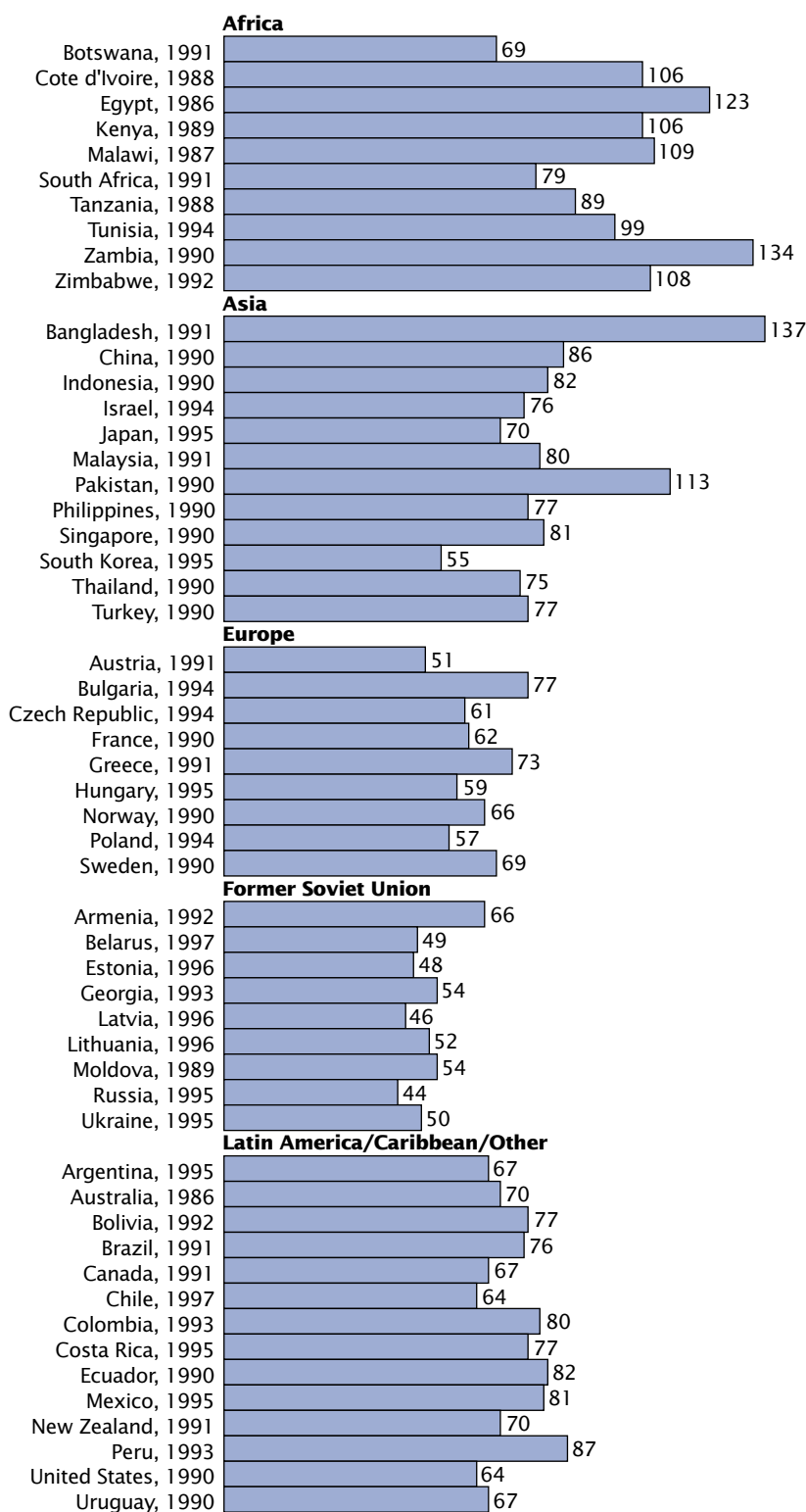


Source: U.S. Census Bureau, 2000a.

Figure 5-2.

Urban Sex Ratios for Persons Aged 65 and Over: 1986 or Later

(Males per 100 females)



Source: U.S. Census Bureau, 2000a.

total versus elderly population residing in rural areas are most striking in Belarus, Bolivia, Botswana, Zambia, and Zimbabwe.

SEX RATIOS OF URBAN ELDERLY TYPICALLY LESS THAN 80

An examination of national data for 54 countries from the period 1986 to 1997 shows that more elderly women than elderly men have been recorded in urban areas in all except eight nations, six of which are in Africa. Sex ratios (number of men per 100 women) for the urban elderly usually are well below 100 (Figure 5-2), and are below 50 in parts of the former Soviet Union.

ELDERLY MEN MORE LIKELY THAN ELDERLY WOMEN TO RESIDE IN RURAL AREAS

Since women live longer than men virtually everywhere, we might expect to see sex ratios of less than 100 for the elderly throughout a given population. Although older women outnumber older men in almost every nation, the ratio of older men to older women generally is higher in rural areas than in cities. In the rural areas of some countries — e.g., New Zealand, Paraguay, and Sweden — older men actually outnumber older women. This rural male surplus is seen most prominently in many countries of Latin America and the Caribbean, which suggests region-specific patterns of gender-specific migration that have implications for health and social security systems in both rural and urban areas.

Conversely, elderly women tend to be somewhat more likely than elderly men to live in urban areas (Figure 5-3).¹ The gender difference in residential concentration probably is related to marital status and health. As discussed in Chapter 6, elderly women are much more likely than elderly men to be widowed, and also are more likely to have chronic illnesses. One study of the elderly in developed countries (Kinsella and Taeuber, 1993) noted an inverse relationship between widowhood rates and sex ratios in urban areas. Urban residence may provide elderly women, especially widows, the benefits of closer proximity to children and/or to social and health services.

SUBNATIONAL URBAN/RURAL DIFFERENCES IN AGE STRUCTURE MAY BE STRIKING

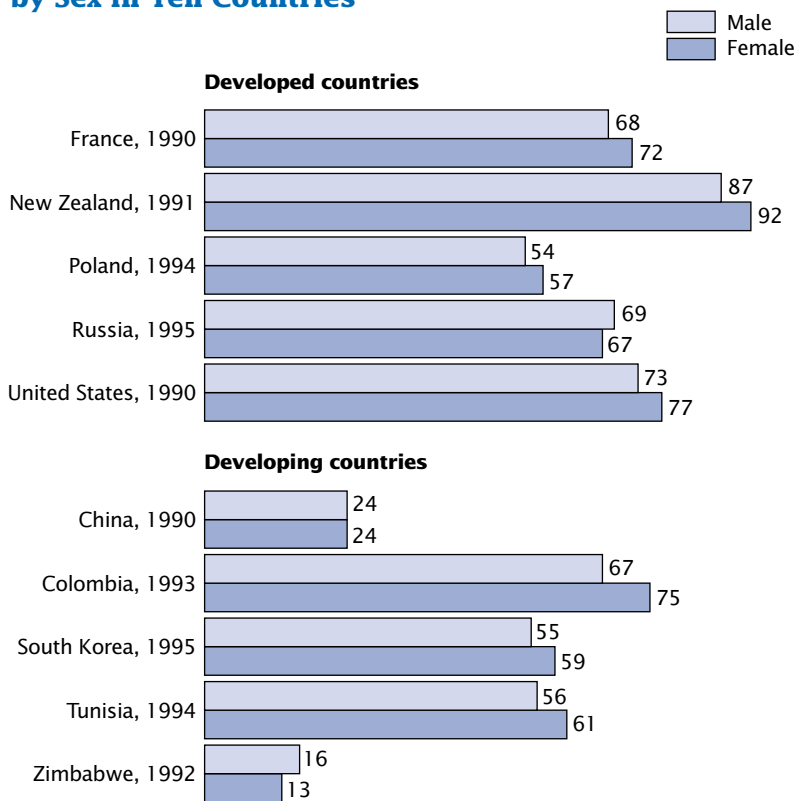
The profile of aging in subnational areas may be very different when examined in view of urban/rural differences. In Russia's 73 oblasts (administrative areas), for example, the rural population of many oblasts is skewed in favor of older people.² Figure 5-4 displays the age and sex distribution of urban versus rural populations in the Kursk Oblast, located in the Central Chernozem Region bordering Ukraine. The pyramid for the rural population has a particularly odd shape, with people aged 65 and older accounting for nearly one-fourth of the total population. In contrast, the urban population of Kursk is 12 percent elderly, about

¹ Grewe and Becker (2000), in a preliminary examination of within-country migration rates for 65 countries with 128 observations from the period 1952-1996, also have noted a likely trend toward disproportionate shares of elderly women in urban areas, and of elderly men in rural areas.

² Although Russia is highly urbanized (over 70 percent of the population lives in urban areas), its rural population remains substantial, numbering approximately 40 million in 1996.

Figure 5-3.

Percent of All Elderly Living in Urban Areas by Sex in Ten Countries



Source: United Nations Demographic Yearbook, 1996.

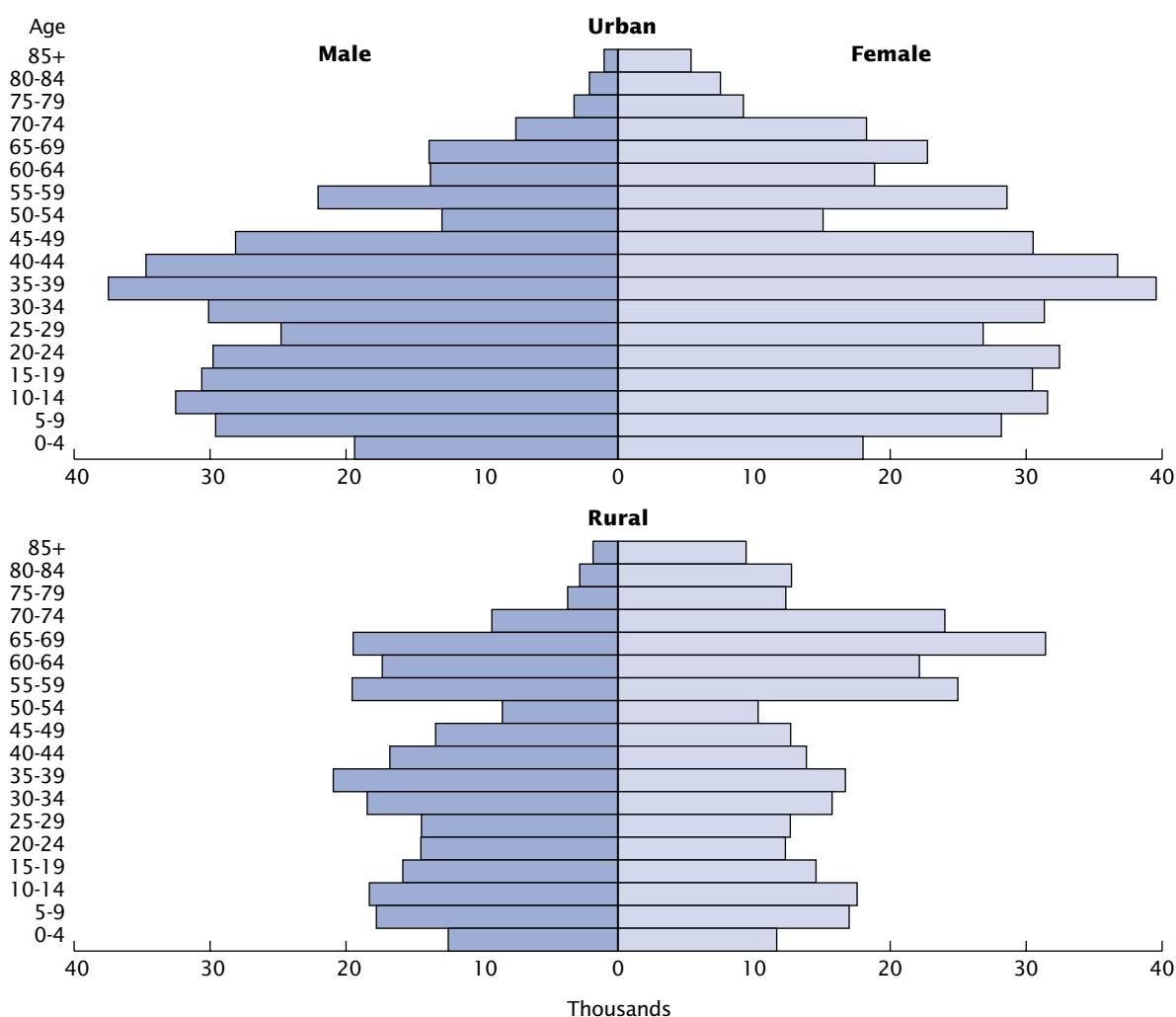
the same as the overall national average. The majority of Kursk's urban population is concentrated in the working ages, which is not true in the rural areas. These pyramids also show disparities in sex composition. Nearly 31 percent of Kursk's rural females are aged 65 and older, compared with just 15 percent of rural males. The sex ratio for the rural elderly population is 41 men per 100 women.

Kursk is not the only Russian oblast to have a large proportion of its rural population, particularly women, in older age groups. In several other oblasts, more than one-fourth of the rural female population is aged 65 or over. In seven oblasts, elderly women account for 30 percent of the entire rural female

population. One reason that rural areas have such high proportions in older age groups is out-migration of younger people to urban areas in search of work. Out-migration of young people may leave older women and men without the direct support of their family. Harsh living conditions and lack of amenities in many rural areas pose additional difficulties for the elderly. In 1996, for instance, official statistics indicate that only 23 percent of Russia's rural population had running water in their homes, and only 3 percent had indoor toilet facilities.

Skewed age structures may present problems for certain localities in terms of the provision of services and aid to older people. Skeldon (1999) has noted, based on the

Figure 5-4.
Urban and Rural Population in Kursk Oblast: 1996



Source: U.S. Census Bureau, 2000a.

experiences of Japan and Korea, the confluence of overall population aging with rural depopulation and stagnation of small and medium-sized towns, and suggests that this pattern will be seen increasingly throughout Asia in the first half of this century. A similar situation has been noted by Golini (2000) with regard to Italy. While there are few if any negative national economic consequences associated with this development, it seems clear that

important emerging issues will revolve around the social conditions of elderly individuals in relatively isolated rural areas.

NO CLEAR TREND TOWARD DISPROPORTIONATE AGING OF LARGE CITIES

Although rural areas tend to be disproportionately elderly compared with urban areas in general, data for some large cities reveal a relatively high proportion of elderly

residents. In countries where the youthful influx of rural-to-urban migrants has slowed in recent decades, many cities may now 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 elderly in cities to be lower than for the country as a whole. Data for 13 major cities (Table 5-1), however, do not

lend themselves to a clear interpretation of trends. The populations of Budapest, London, and Moscow are in fact older than their respective national averages, but this is not the case in Berlin, Paris, and Tokyo. Bangkok and Harare are younger than Thailand and Zimbabwe as a whole, but a similar relationship does not hold in the Chinese cities of Beijing and Shanghai, nor in Mexico City. In the United States in general, census data from 1960 through 1990 indicate that the central cities of metropolitan areas have, on balance, consistently lost elderly migrants to nonmetropolitan areas (Fuguitt and Beale, 1993).

ARE RURAL ELDERLY DISADVANTAGED?

The exodus of younger people from the countryside to cities raises the rural proportion of elderly residents in many countries. As a result, traditional family support systems for the frail elderly may change. Younger family members living in urban areas are unlikely to provide direct care for distant elders remaining in rural areas. At the same time, younger family members who move to cities may have improved financial resources that can be used to help elderly relatives still living in the rural birthplace.

Quality-of-life issues for older populations in rural versus urban areas are beginning to receive additional attention as migration streams increase and the costs of health care and public benefits escalate. Whereas graying rural communities were once associated with negative socioeconomic consequences, more recent research in developed countries has considered positive results that may stem from increased proportions of increasingly affluent elderly (Bean et al., 1994). Data from

Table 5-1.
Percent of Older Population in 13 Cities Compared With Respective National Average

City	Year	Age group	City percent	Country percent
Bangkok, Thailand	1995	65+	4.2	5.4
Beijing, China	1990	65+	6.2	5.6
Berlin, Germany	1993	65+	13.7	15.1
Budapest, Hungary	1990	60+	21.5	18.9
Buenos Aires, Argentina	1991	65+	8.2	8.9
Harare, Zimbabwe	1992	65+	1.6	3.3
Greater London, United Kingdom	1991	65+	14.4	10.0
Mexico City, Mexico	1995	65+	5.2	4.4
Moscow, Russia	1989	65+	12.0	9.6
New York, United States	1990	65+	13.0	12.6
Paris, France	1990	60+	15.7	19.9
Shanghai, China	1990	65+	10.1	5.6
Tokyo, Japan	1990	65+	9.4	12.0

Note: Data for Mexico City refer to the Federal District.

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

Wales (Wenger, 1998) suggest that rural dwellers are more likely than their urban counterparts to be involved in community and voluntary activities. Nevertheless, the provision of health and other supportive services to ill and disabled older people in rural areas continues to present special challenges. Perhaps because of these difficulties, the percentage of older disabled people remaining in the community without being institutionalized is lower in predominantly rural areas than in urban areas (Suzman, Kinsella, and Myers, 1992).

MIGRATION PATTERNS OF OLDER PEOPLE NOT WELL DOCUMENTED

International migration of elderly people, as noted in Chapter 2, is not a significant demographic factor in many countries. Within-country migration, however, may be substantial. One common perception of older people is that they tend to be much less mobile than younger people, typically "aging in place" in communities that have been home for many years. While this may be true in a general sense, various national studies suggest that geographical mobility among older

people is increasing. In the 1970s, the mobility of the Japanese population declined in all age groups with the exception of the elderly (Otomo and Itoh, 1989). Census data for Canada show that 23 percent of all people aged 60 and over changed their principal residence at least once during the 5-year period 1986 to 1991. Thirteen of the fifty states in the United States had net elderly inmigration rates of more than 10 per 1,000 elderly population during the 1985-90 period, and one out of five residents of Florida is now aged 65 or older. A "retirement effect," i.e., an increase in mobility rates at ages 60 to 64, has been noted in the United States and the United Kingdom (Long, 1992). Refugee movements in Bosnia, Mozambique, and elsewhere have involved vast numbers of older people (Kalache, 1995) who are often overlooked in relief operations that focus on children and young adults.

One of the few cross-national studies of elderly migration (Rogers, 1988) identified two basic patterns. One is characterized by amenity-motivated, long-distance relocation, the other by intracommunity, assistance-motivated short-distance moves. Available studies in developed countries suggest that the latter are much more common, although the former may become

more prevalent as levels of education and retirement income increase. In the United States, the oldest old have been seen to move more frequently than younger elderly, suggesting that the moves of the oldest old are related to health problems and the need for different living arrangements (Hobbs and Damon, 1996). Recent Canadian survey data find that older people moved most often because of the size of their home (usually opting for a smaller residence), a desire to live in a better neighborhood, or to build/purchase a home (Che-Alford and Stevenson, 1998). Among older Canadians with daily activity limitations in 1991, the percent who moved in the previous 5 years was roughly the same as among the overall older population (22 percent), but about one-third of these people relocated to homes with special health features. A German study of motivating factors for elderly mobility in the city of Heidelberg (Oswald, Wahl, and Gang, 1997) suggests that basic needs (e.g., health) were roughly as important as "higher-order" needs such as privacy.

Information on migration patterns of older people in developing countries is fragmented at best. Although rural-to-urban migration usually is associated with younger

adults, there is mounting evidence that the movement of older people to urban areas is becoming significant (Myers and Clark, 1991). There is much less empirical information on the topic of return migration of older people to rural places of origin. One review of available data for Africa (Becker, 1991) concludes that, while return migration of older people to their ancestral homes is not uncommon, several factors — growing land pressure, formalization of rural property rights, the increasing viability of family support for elders in urban areas — will dampen the likelihood of future return migration. Skeldon (1999) notes that, while return migration may increase the size of older rural cohorts and aggravate social support issues, return migrants also may bring with them wealth, knowledge, and other resources, particularly in the form of pension income earned during years spent in the urban labor market. Migration from and within developing countries in general has come to be seen as a strategic family decision rather than as an individual decision on the part of young leavers (Vatuk, 1995). To the extent that migration raises family incomes and the ability to reunite members, increased movement of older people may be expected in the future.

CHAPTER 6.

Sex Ratios and Marital Status

One common characteristic of populations throughout the world is the preponderance of women at older ages. Women are the majority of the elderly population in the vast 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 involve marital status and living arrangements. As discussed further in Chapter 8, family members are the main source of emotional and economic support for the elderly, although in some developed countries the state has assumed a larger share of the economic responsibilities.

Marital status strongly affects many aspects of one's life. Studies in developed countries show that married people, particularly married men, are healthier and live longer than their nonmarried counterparts (Goldman, 1993; Hadju, McKee, and Bojan, 1995; Waite, 1995; Schone and Weinick, 1998). Older married couples tend to be more financially secure than nonmarried people. Changes in marital status at older ages can affect pension potential, retirement income, and an individual's social support network; many older widowed men, in particular, may lose contact with much of their support network after their wife dies (O'Bryant and Hansson, 1996). In contrast, widowed women tend to maintain their support network after the death of a spouse (Scott and Wenger, 1995). Marital status also influences one's living arrangements and affects the nature of

caregiving that is readily available in case of illness or disability.

HIGHER MALE MORTALITY RESULTS IN GENDER IMBALANCE AT OLDER AGES

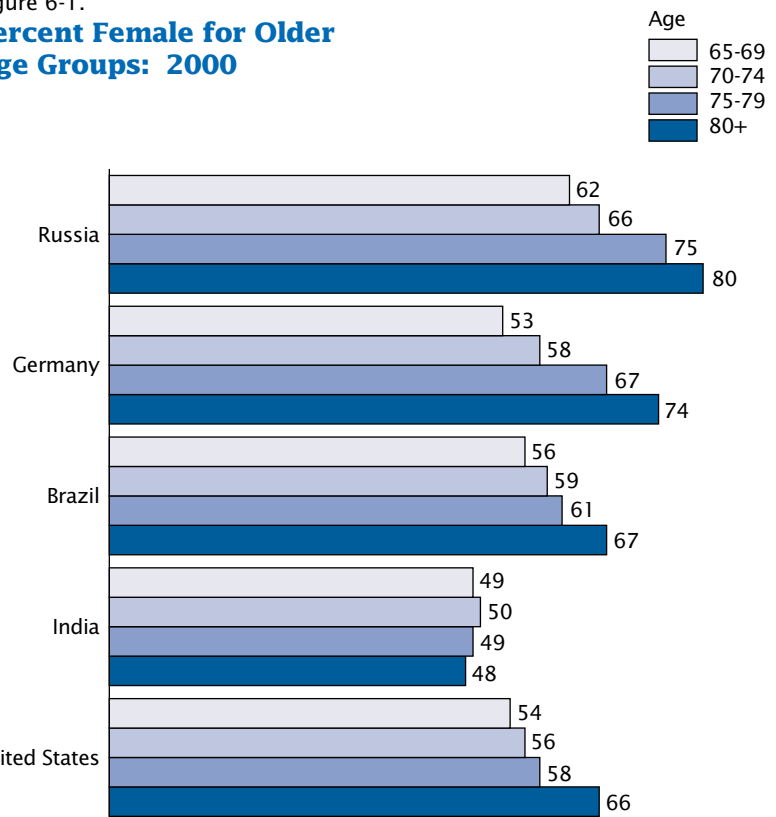
The primary reason for the numerical female advantage at older ages is the sex differential in mortality discussed in Chapter 3. Although more boys than girls are born, males typically have higher mortality rates than females. The sex differential in mortality begins at birth and continues throughout the life course. One outcome of higher

male mortality rates is that between age 30 and 40, women usually begin to outnumber men. In most countries, the relative female advantage increases with successively older age (Figure 6-1).

WORLD WAR II IS STILL EVIDENT IN SEX COMPOSITION AT OLDER AGES

Historical events can play a major role in shaping the gender composition at older ages. For instance, the lingering effects of heavy war mortality during World War II still can be seen in the proportion female at older ages in certain countries. In

Figure 6-1.
Percent Female for Older Age Groups: 2000



Source: U.S. Census Bureau, 2000a.

Russia, women account for 80 percent of the oldest old (aged 80 and older) and in Germany they represent nearly 74 percent. In contrast, women account for only two-thirds of the oldest-old population in Brazil and the United States.

THERE IS GREAT NATIONAL DIVERSITY IN SEX RATIOS AMONG ELDERLY

A sex ratio is a common measure used to portray a population’s gender composition. A sex ratio is conventionally defined as the number of men per 100 women in a given population or age category. Sex ratios greater than 100 indicate more men than women, and sex ratios under 100 indicate the reverse (i.e., more women than men). In most countries of the world, sex ratios at older ages are below 100, in some cases quite a bit below (e.g., Russia’s sex ratio is 46 men per 100 women aged 65 and older). Developed countries tend to have lower sex ratios at older ages than do developing countries (Figure 6-2), although there are many exceptions to this generalization. The typical difference between developed and developing countries is explained by sex differentials in life expectancies at birth. As shown in Chapter 3, developed countries tend to have larger sex differentials in life expectancy at birth than do developing countries, which results in greater numbers of women than men at older ages.

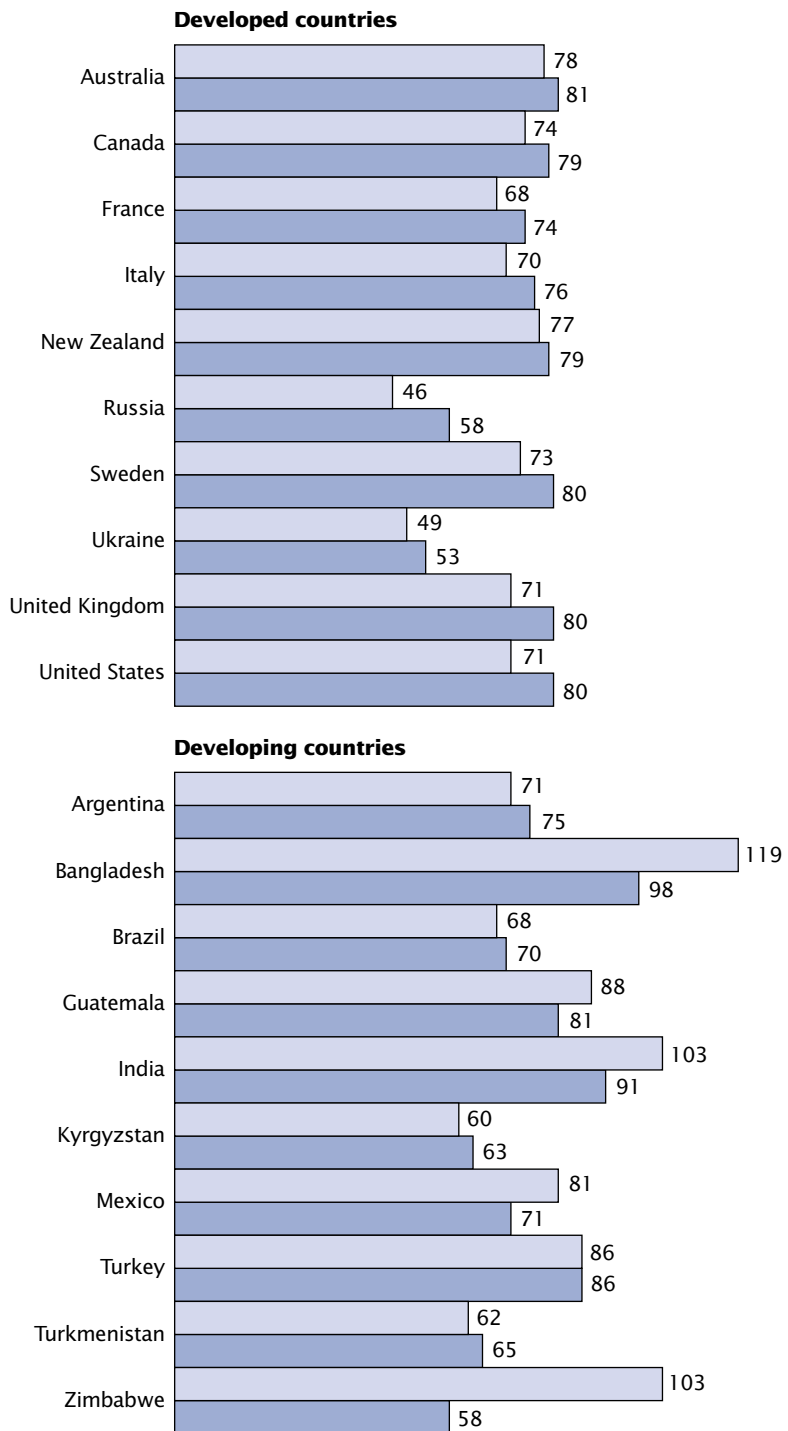
PROJECTED TREND IN SEX RATIO DIFFERS BY DEVELOPMENT STATUS

In the future, sex ratios at older ages are projected to move in opposite directions in the aggregate

Figure 6-2.
Sex Ratio for Population 65 Years and Over: 2000 and 2030

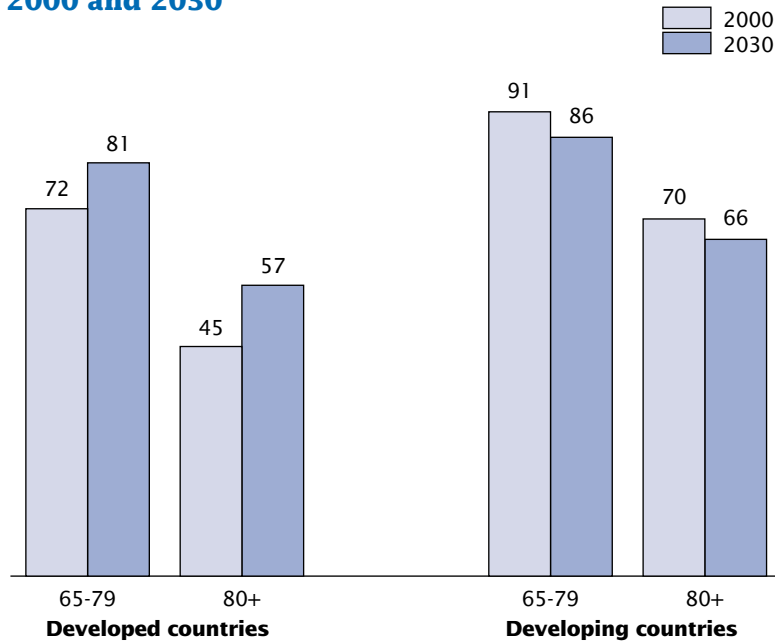
(Males per 100 females)

2000
2030



Source: U.S. Census Bureau, 2000a.

Figure 6-3.
**Aggregate Sex Ratios for Older Age Groups:
 2000 and 2030**



Source: U.S. Census Bureau, 2000a.

developed and developing worlds. Between today and 2030, sex ratios for the elderly are expected to increase in many developed countries because the gender gap in life expectancy is projected to narrow (Figure 6-3). In other words, most demographers expect that male life expectancies in developed countries are likely to improve at a faster pace than female life expectancies. The opposite is anticipated in many developing countries. In view of the historical pattern in developed nations, sex differentials in developing-country life expectancies are projected to widen, which will in turn lead to lower future sex ratios.

Regardless of the projected trends, women are expected to make up the majority of the world's elderly population (particularly at the oldest ages) well into the next century. Continuing or growing disparities in sex ratios mean that many of the challenges and problems faced by the elderly of today and tomorrow are, in essence, challenges and problems faced by older women.

Table 6-1.
**Sex Ratios for Population Aged 65 and Over for Countries
 With More Elderly Men Than Women: 2000**

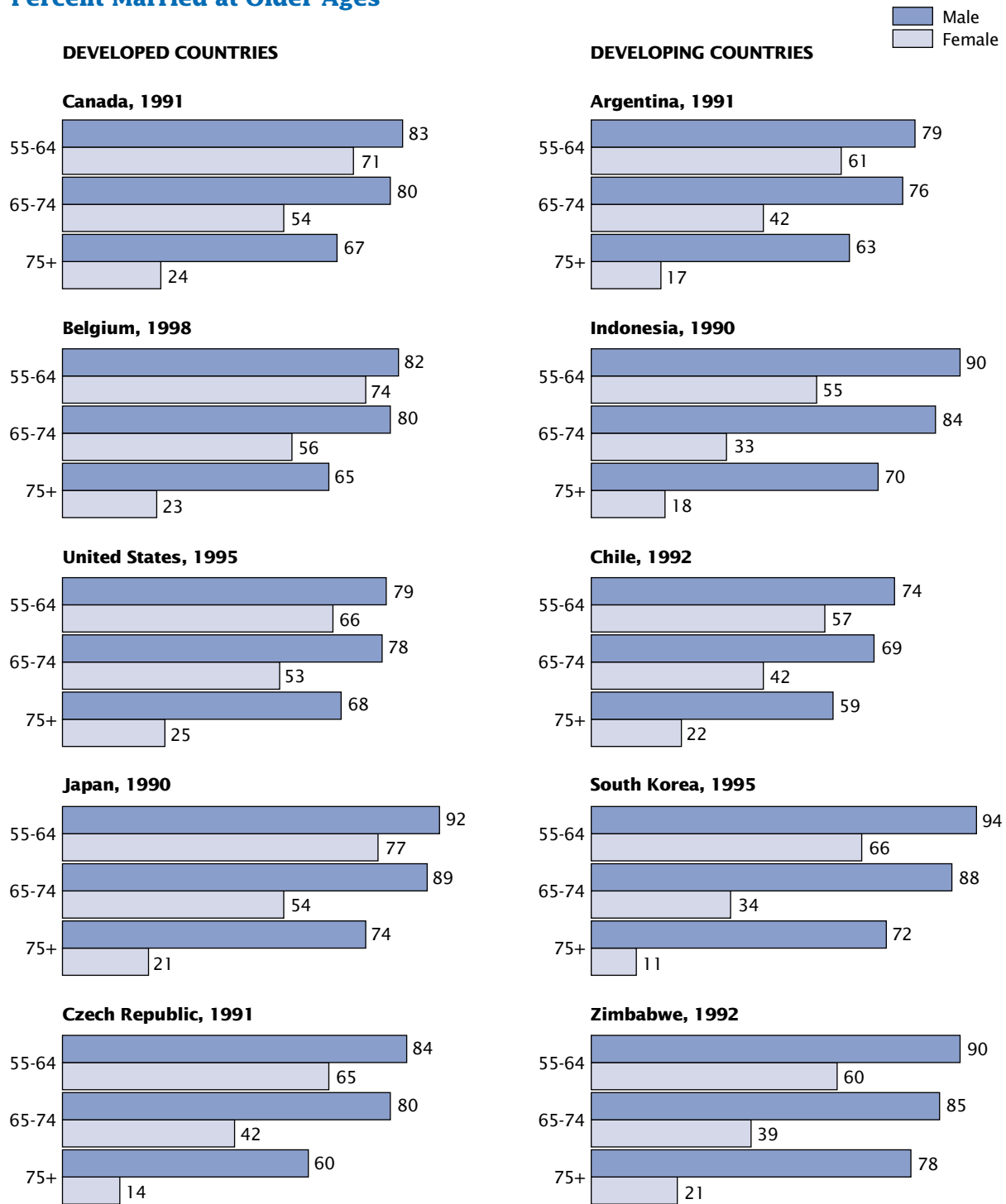
Country	Sex ratio
Qatar	243
United Arab Emirates	226
Kuwait	182
Sudan	133
Bangladesh	119
Saudi Arabia	118
Iran	112
Taiwan	113
Afghanistan	112
Niger	111
Oman	111
The Gambia	111
Eritrea	104
Yemen	104
Bahrain	104
Bhutan	103
India	103
Tunisia	101

Source: U.S. Census Bureau, 2000a.

Sex ratios at younger ages in some countries of the world already are quite skewed in favor of women. This imbalance may be due to excess male mortality at young ages because of wars and other forms of violence, disease, or to disproportionate out-migration of young men seeking work in other countries. If mortality is the cause of such severe sex ratios at younger ages, then the implications for the eventual aging of these cohorts is different than if the cause is

Figure 6-4.

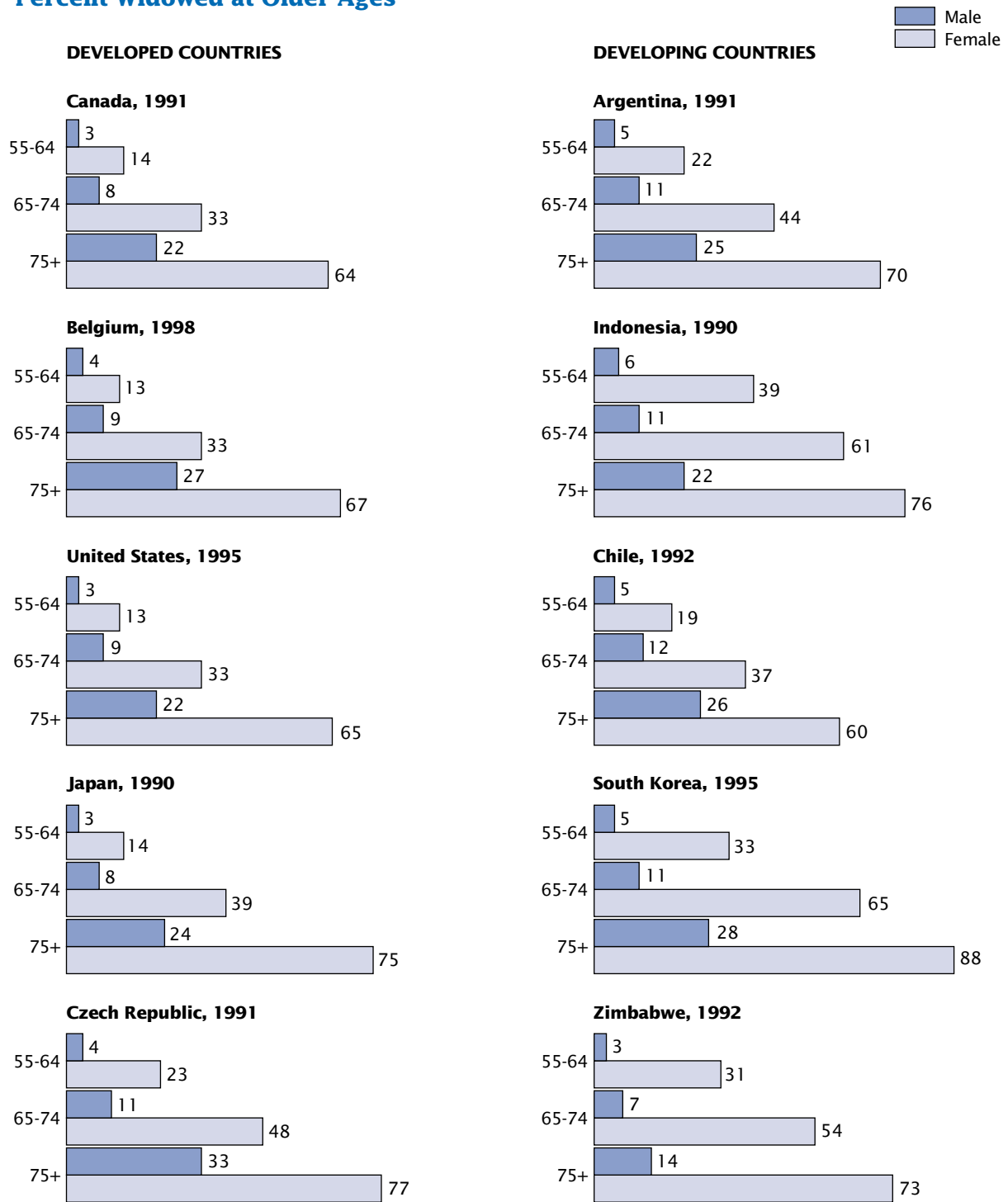
Percent Married at Older Ages



Source: U.S. Census Bureau, 2000a.

Figure 6-5.

Percent Widowed at Older Ages



Source: U.S. Census Bureau, 2000a.

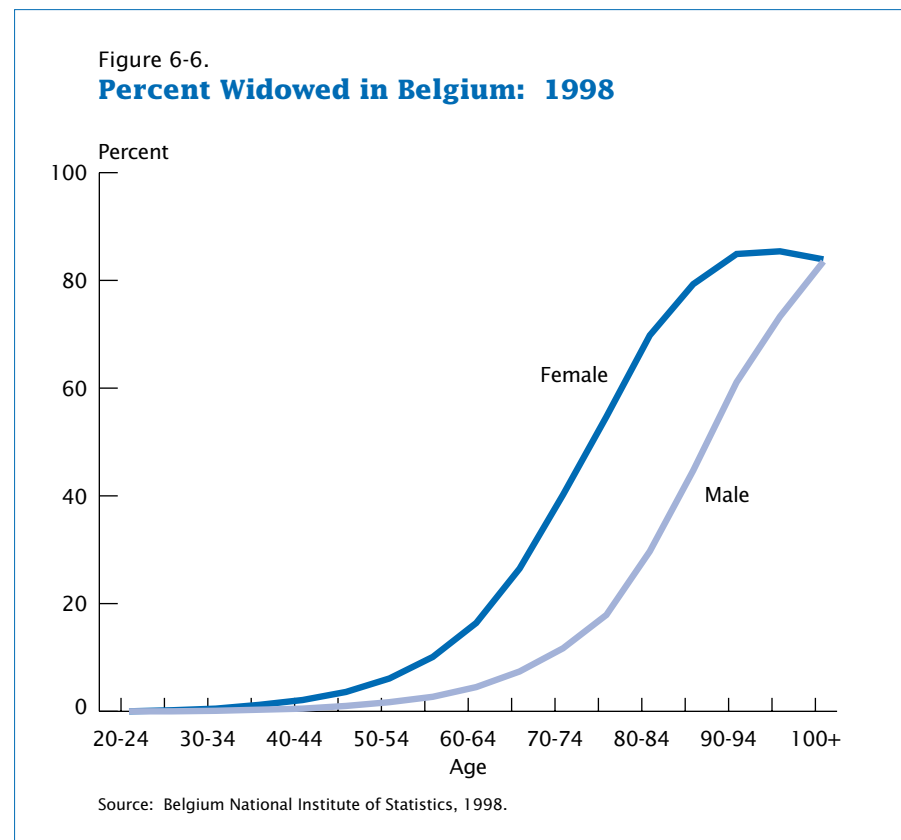
migration and the migrants return to their native country when they retire (or return for other reasons).

ELDERLY MEN OUTNUMBER ELDERLY WOMEN IN SOME COUNTRIES

While women outnumber men at older ages in most countries, there are 18 countries in Asia and Africa where available data suggest that the reverse is true (Table 6-1). One likely explanation involves the social status of women versus men in certain cultures. The relatively low numbers of women at older ages may reflect past levels of higher female than male mortality, which could be related to discriminatory treatment accorded girls and women throughout their lifetime. High sex ratios at older ages also may be statistical artifacts. That is, women (especially older women) may be undercounted to a greater extent than men in some national censuses, insofar as men are more likely to interact with census enumerators and may neglect to provide information on all female household members. Furthermore, certain concentrated patterns of male labor migration may affect sex ratios to the extent that a significant portion of migrants remains in the host country after reaching age 65.

OLDER MEN ARE MARRIED; OLDER WOMEN ARE WIDOWED

Older men are more likely to be married and older women are more likely to be widowed in most countries of the world (Figures 6-4 and 6-5). In all but six of the 51 study countries with data on marital status, over 70 percent of men aged 65 and older were married. Even at ages 75 and older, a majority of men were married. In contrast, only 30 to 40 percent of women



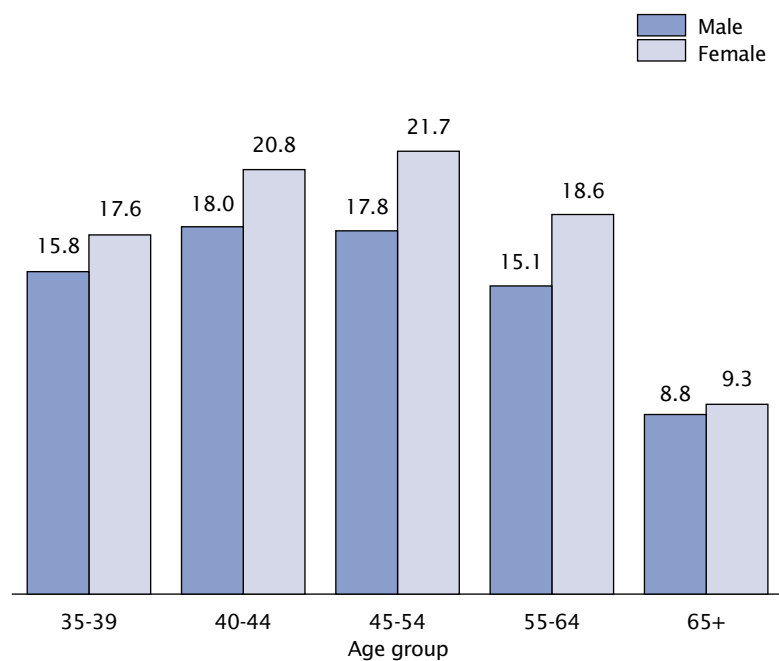
aged 65 and over were married in most study countries. Elderly women are much more likely to be widowed. In 32 of the study countries, over half of elderly women are widowed.

For both men and women, the proportion married decreases with older age and the proportion widowed increases. However, gender differences in survival and other factors (see below) result in very different average ages of widowhood/widowerhood. In the case of Belgium in 1998, 82 percent of men aged 55 to 64 were married, compared with 74 percent of women in that age group. At ages 75 and over, 65 percent of men were still married, compared with only 23 percent of women. The gender difference in proportions widowed is correspondingly pronounced (Figure 6-6). Data for Zimbabwe show that

3 percent of men and 31 percent of women aged 55 to 64 were widowed in 1992. At ages 75 and over, the respective figures were 14 percent of men and 73 percent of women. These data are typical of the pattern seen in both developed and developing countries.

The gender difference in marital status results from a combination of factors. The first is the aforementioned sex difference in longevity; women simply 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 find herself without a spouse 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 (Velkoff and

Figure 6-7.
Percent Divorced and Separated in the United States: 1999



Source: U.S. Census Bureau, 2000a.

Kinsella, 1993; Cattell, 1997). The fact that women are likely to lose 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/private pension support (Hungerford, 2001).

ELDERLY MORE LIKELY TO BE MARRIED THAN IN THE PAST

Over the last two or three decades, the marital status of the elderly has changed. In a majority of the study countries, the proportion of older men and women who are married has increased slightly and the proportion who are widowed has

decreased. Some of the change is attributable to improved joint survival of husbands and wives (Myers, 1992). In certain countries, some of the change can be explained by the different marital experiences of birth cohorts. For instance, the diminishing effects of World War II can be seen when the widowhood rates of older women in Russia are compared for 1979 and 1994. In 1979, 72 percent of older women in Russia were widowed while only 58 percent were widowed in 1994. By 1994, the cohorts that were most affected by the war were aged 75 and older.

SMALL PROPORTIONS OF ELDERLY HAVE NEVER MARRIED

Relatively few elderly in most countries have never married. In more than half of the study countries, 5 percent or less of elderly men and 10 percent or less of elderly women

have never married. In some European countries, the larger proportions of elderly women who have never married may be attributable to World War II. Many of today's elderly women were of prime marriage age soon after the war, when there was a shortage of potential spouses due to war deaths. Higher-than-average proportions of never-married elderly are found in several Latin American and Caribbean nations, which could be a function of the prevalence of consensual unions. While the category "consensual union" is widely used in census tabulations in these countries, some people living (or who have lived) in a consensual union are likely to report themselves to be never married.

FUTURE ELDERLY MORE LIKELY TO BE DIVORCED

Percentages currently divorced among elderly populations tend to be low. However, this will change in the near future in many countries as younger cohorts with higher proportions of divorced/separated people move into the ranks of the elderly (Gierveld, 2001). For instance, in 1999 in the United States, around 9 percent of the elderly were divorced or separated compared with nearly 15 percent of men and 19 percent of women aged 55 to 64. The proportion divorced/separated is higher still for the age group 45 to 54 (Figure 6-7). The changing marital composition of the elderly population as these younger cohorts reach age 65 will affect the nature and types of support services that both families and governments may need to provide, especially with regard to the growing number of elderly who lack direct familial support (Pezzin and Schone, 1999).

CHAPTER 7.

Living Arrangements

Living arrangements are affected by a host of factors including marital status, financial well-being, health status, and family size and structure, as well as cultural traditions such as kinship patterns, the value placed upon living independently, the availability of social services and social support, and the physical features of housing stock and local communities. On the individual level, living arrangements are dynamic, representing both a result of prior events and an antecedent to other outcomes (Van Solinge, 1994). On the societal level, patterns of living arrangements among the elderly reflect other characteristics — demographic, economic, and cultural — which influence the current composition and robustness of older citizens. In turn, living arrangements affect life satisfaction, health, and most importantly for

those living in the community, the chances of institutionalization.

Three major observations emerge from a cross-national comparison of living arrangements of the elderly. First, women in developed countries are much more likely than men to live alone as they age; older men are likely to live in family settings. Second, both elderly men and women in developing countries usually live with adult children. Third, the use of nonfamily institutions for care of the frail elderly varies widely around the world.

MORE THAN HALF OF ELDERLY DANISH WOMEN LIVE ALONE

Table 7-1 presents data from the 1990s on proportions of older people living alone in what are usually considered to be private (i.e., noninstitutional) households. Since women outlive men in virtually all

countries of the world, it is not surprising to find that the share of older women living alone is higher than that of men. For elderly men in developed countries, the proportions range from a low of 5 percent in Japan to a high of 25 percent in Sweden. Proportions of elderly women residing singly are universally higher, reaching half or more in Denmark, Germany, and Sweden. Percentages in developing countries tend to be much lower, although the levels for men and women in some countries (e.g., Argentina, Cyprus) rival those of certain European nations. Again, older women are more likely than older men to live alone; St Lucia and Taiwan are the only exceptions in Table 7-1.

The gender gap for those living alone generally increases with age (Figure 7-1). However, for countries

Table 7-1.
Percent of Elderly Population Living Alone: Data From 1990 to 1999

Developed countries	Male	Female	Developing countries	Male	Female
Australia	13.7	29.3	Argentina	11.2	21.1
Canada	14.1	33.7	Aruba	12.5	15.4
Czech Republic	19.0	47.5	Bolivia	13.2	15.7
Denmark	23.3	52.0	Cyprus	10.6	24.8
Finland	19.5	46.5	Hong Kong	11.6	13.2
France	15.3	40.2	Mexico	7.5	14.0
Germany	16.9	50.8	Morocco (60+)	11.3	44.7
Greece	8.7	22.8	Philippines(60+)	4.4	6.4
Ireland	18.9	27.7	South Korea(60+)	3.1	11.8
Japan	5.2	14.8	St. Lucia	20.9	18.9
New Zealand	17.8	38.0	Taiwan	13.0	7.4
Norway	21.3	44.7	Thailand(60+)	2.9	5.5
Portugal	9.4	23.9	Vietnam(60+)	2.5	8.1
Romania	12.4	31.7			
Sweden	25.1	49.9			
United States	15.1	36.8			

Note: Data for Mexico are for seven cities, and refer to 1989. Data are for household populations aged 65 and over, unless otherwise noted. Data for Morocco refer to urban areas only.

Sources: Compiled from data in United Nations Demographic Yearbooks (various dates) and national sources.

that disaggregate data at advanced ages, the gender difference tends to diminish at very old ages, presumably as a result of health and/or economic factors that require institutional caretaking, communal living, or sharing of housing costs. Both numbers and proportions of elderly living alone have risen sharply in developed countries since the early 1960s, although recent information suggests that the rise in proportions might be leveling off in some nations. Everywhere, however, the absolute numbers are increasing. Figure 7-2 illustrates a trend common to most developed countries, i.e., the increase has been largely fueled by women. Data from the 1996 census of Canada show more than 700,000 elderly women living alone, a jump of more than 180,000 since 1986. The number of elderly women living alone grew at an average annual rate of 5.4 percent from 1961 to 1996, compared with a rate of 1.4 percent for the entire Canadian population. One implication of such change is that, in most developed countries, women must anticipate a period of living alone at some point during their older years.

“ELDERLY-ONLY” HOUSEHOLDS ARE INCREASINGLY COMMON

An earlier version of this report (Kinsella and Taeuber, 1993) pointed out that elderly people living alone were a significant factor in national household profiles in Europe. In several nations (e.g., Belgium, Denmark, France, and the United Kingdom) in the 1980s, more than 11 percent of all national households consisted of a solitary individual aged 65 or over. The most common living arrangement for the elderly in Europe was with

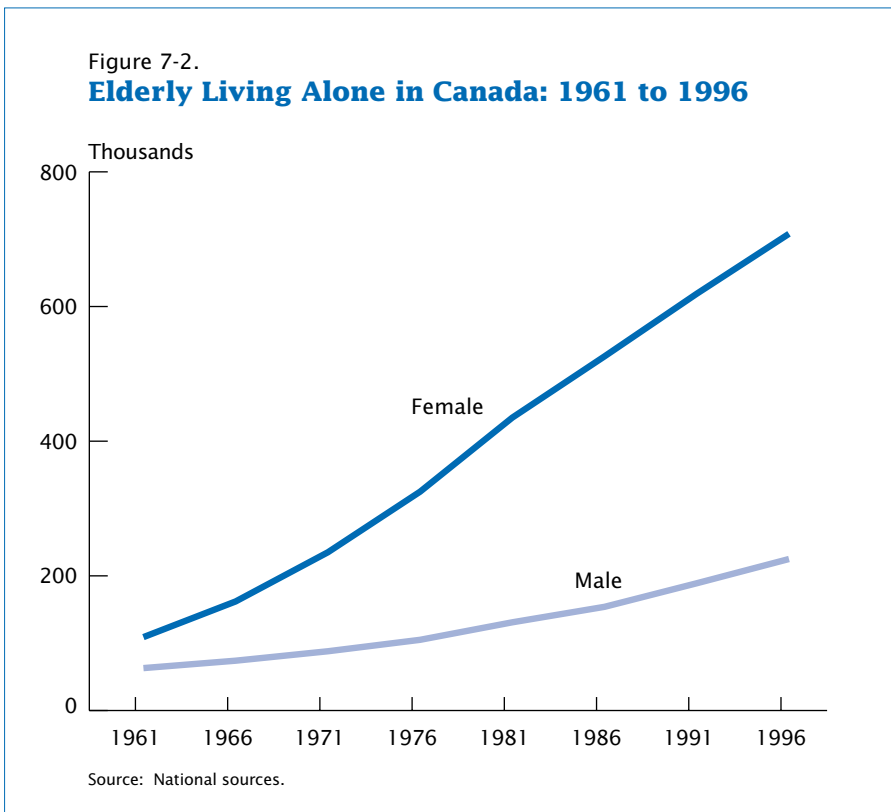
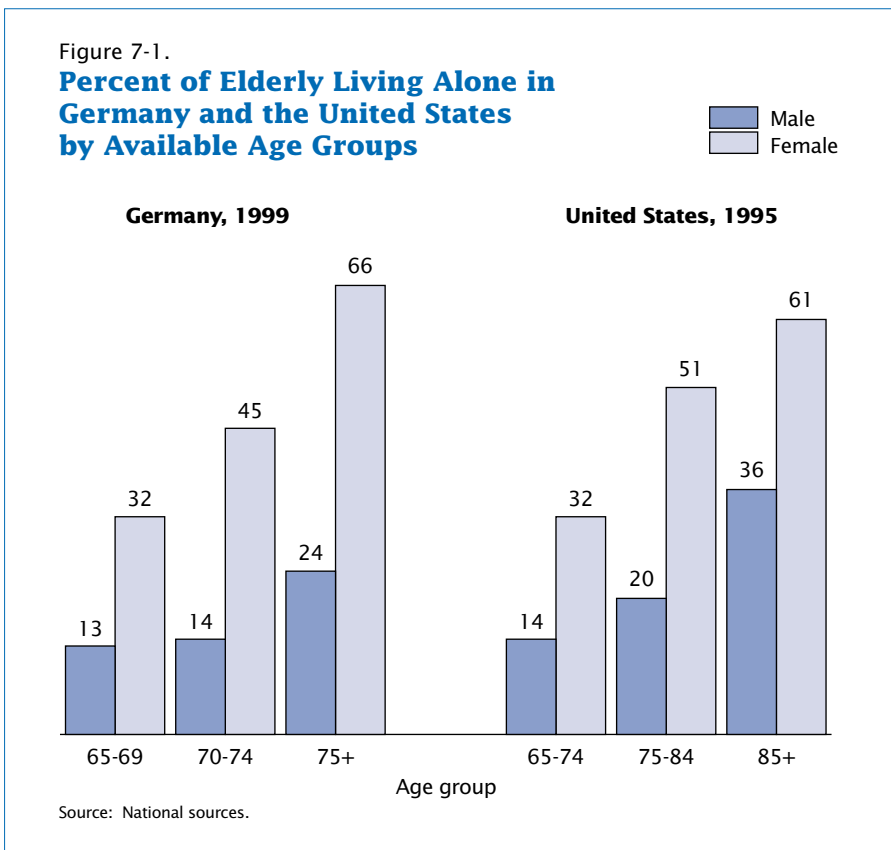


Table 7-2.
Composition of European Households With Elderly Members: Early 1990s

Country	Percent elderly in households with:				
	One person 65 years or over (1 person household)	Another person 65 years or over (2 person household)	Another person under 65 years (2 person household)	Two other persons	Three or more other persons
Denmark	42.4	40.6	11.4	4.1	1.5
Greece	17.7	29.4	14.2	15.0	23.7
Spain	16.6	31.4	11.3	17.4	23.3
France	32.1	39.9	11.9	9.7	6.5
Ireland	26.2	25.3	13.1	16.4	18.9
Italy	25.9	31.3	12.7	14.7	15.4
Netherlands	35.5	45.4	11.5	5.5	2.2
Austria	35.3	29.4	12.9	10.2	12.2
Portugal	18.5	33.8	11.9	14.4	21.3
Finland	38.4	32.2	12.8	8.9	7.7
Sweden	41.1	44.4	10.0	3.6	0.9
United Kingdom	35.7	40.5	11.9	7.9	3.9
Switzerland	34.0	41.2	12.6	8.1	4.1

Source: Eurostat, 1996.

another elderly person in a two-person household. A related calculation revealed that three out of every ten households in a 12-nation European aggregate contained at least one elderly person.

Data from the 1991 census of Great Britain (for England, Wales, and Scotland) are even more striking; 15 percent of all households in Great Britain consisted of a single pensioner living alone, while another 10 percent of households had two or more pensioners with no other people present. Hence, 25 percent of all households in the country consisted of pensioners only. Overall, one-third of Britain's households had at least one resident pensioner.

In developed countries, the growth in "elderly-only" households may be due in part to changes in social and economic policies. These include: increases in benefits that allow older people to live independently of their children; programs that more easily permit the conversion of housing wealth into income; programs that encourage the building of elderly-friendly housing; and revisions in

reimbursement payments which discourage institutional living.

MAJORITY OF ELDERLY IN DEVELOPED COUNTRIES LIVE WITH OTHER PEOPLE

Although high proportions of elderly often live alone in developed countries, a majority of those aged 65 and over still live with other people. Data from 13 European nations (Table 7-2) show that the proportion of elderly living with one other elderly person only (in most cases a spouse) tends to be higher than the proportion living singly. Between 10 and 14 percent of the elderly in the 13 nations live with one other person who is less than 65 years of age; many of these elderly are likely to be either men living with younger spouses, or widowed or divorced individuals living with a child. Nations vary greatly in the proportion of elderly people living in households of three or more people, from only 5 to 6 percent in Sweden and Denmark to 35 percent or more in Ireland, Greece, Portugal, and Spain. As earlier studies (Wall, 1989; Pampel, 1992) have noted,

national differences in elderly living arrangements in Europe are characterized more by diversity than by similarity.

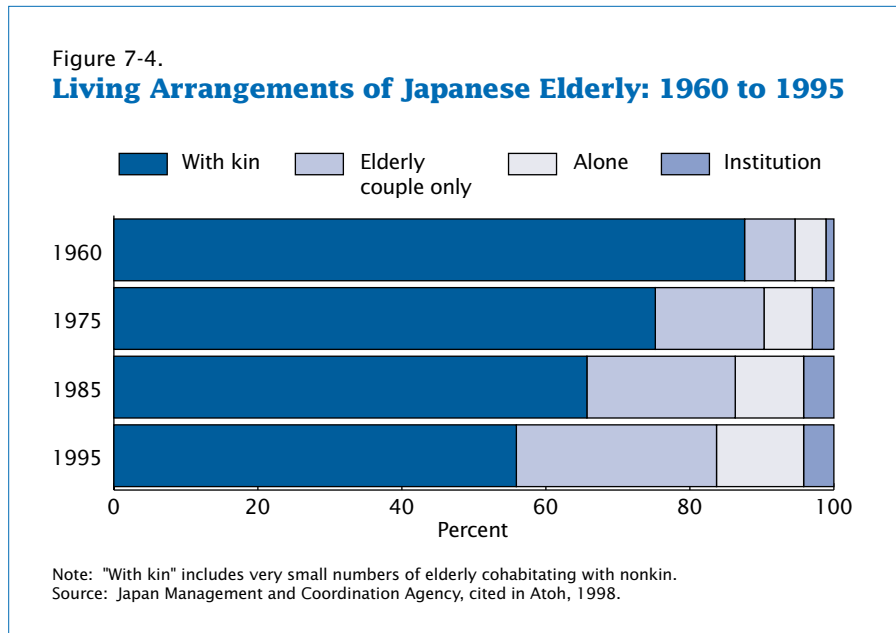
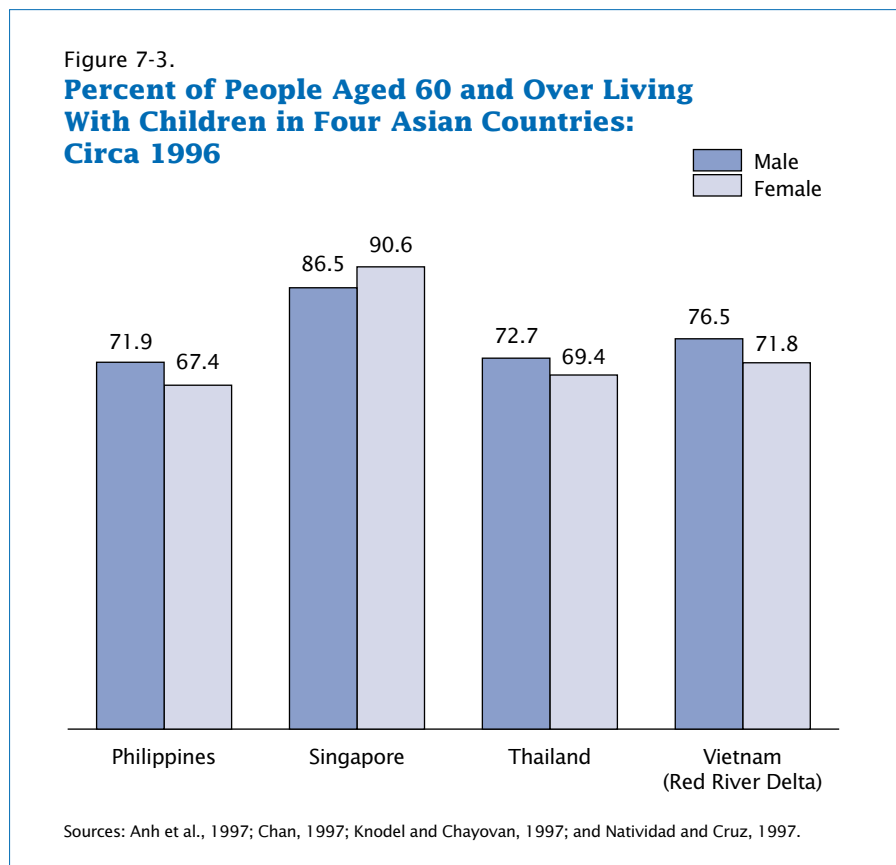
TWO- OR THREE-GENERATION HOUSEHOLD STILL THE DEVELOPING-COUNTRY NORM

In all developing regions of the world, with the possible exception of the Caribbean, the most common living arrangement for elderly people (married or widowed) is with children and/or grandchildren. Between 72 and 79 percent of older (60 and over) respondents in 1984 World Health Organization surveys in Malaysia, the Philippines, Fiji, and South Korea lived with children (Andrews et al., 1986), and similar results have been observed in countries as diverse as India, Indonesia, Cote d'Ivoire, Singapore, and (at earlier times) six Latin American nations (Kinsella, 1990). More recent data from four Asian nations (Figure 7-3) show a persisting pattern. While the levels may appear similar, the broad category of "living with offspring" encompasses a plethora of specific family and

household types, differing not only among nations but among ethnic groups within nations. Such diversity points to the importance of cultural and ideological as well as demographic factors in the determination of living arrangements of older people (Albert and Cattell, 1994).

A growing concern in developing countries is the extent to which the twin processes of modernization and urbanization will change traditional family structures (Zhou, 2000). Data for most of the developing world generally are insufficient for documenting changes in living arrangements of the elderly. Although the case of Japan may not seem especially relevant to developing nations, the extended family structure common to the latter has historically been a feature of Japanese society as well. Time series data (Figure 7-4) show that the number and proportion of extended-family households in Japan have been declining, and that the proportions of elderly living alone or with spouse only have been increasing.

These trends in Japan have led to the suggestion (Kamo, 1988) that the impact of industrialization has undermined the indigenous culture of Japan vis-a-vis the status of its elderly citizens, and set the stage for the eventual predominance of the nuclear family. Related to this is the notion of "intimacy at a distance" (see, e.g., Stehouwer, 1968; Rowland, 1991). That is, as the financial (and to some extent health) status of elderly people improves, a larger proportion are able to afford to live alone and choose to do so in independent dwellings, while at the same time maintaining close familial contact and exchange supports. A growing

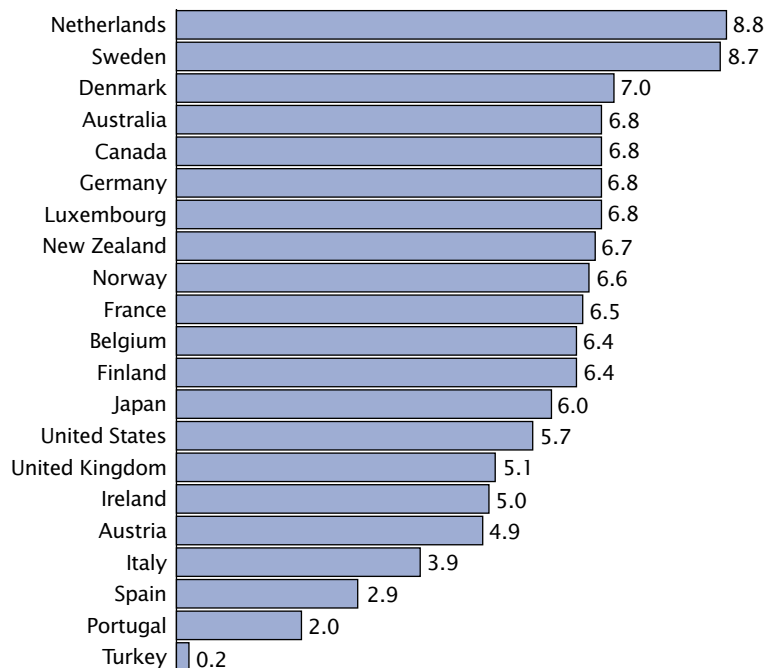


literature relates improvements in social security programs and general economic welfare to the ability and desire of older persons to choose independent living arrangements, presumably reflecting

normative changes toward individualism and personal independence (see, e.g., the discussion and references in Gierveld, 2001). This concept has found general currency in a variety of cultural settings,

Figure 7-5.

Percent of Elderly in Residential Care: Early to Mid-1990s



Notes: Canada and Finland: figures represent the midpoint of an estimated range.
Japan and the Netherlands: some of the residential care is provided in hospitals.
Sources: OECD, 1996; Jacobzone, 1999.

although a recent analysis of data from the Indonesian Family Life Survey (Cameron, 2000) finds little evidence that increases in the income of the elderly, or that of their children, lead to a significant change in traditional family structure.

NUMBERS OF INSTITUTIONALIZED ELDERLY RISING

A number of studies (e.g., Manton, Stallard, and Liu, 1993; Weiner and Illston, 1995; Leung, 2000) have documented the direct relationship between population age-sex structure, age-sex-specific rates of chronic disease and disability, and the need for long-term care. The confluence of several macro trends in developed countries — older population age structures, higher incidence of noncommunicable disease,

lowered fertility, increased geographical mobility, and the rapid advance in medical technology — has led to a steep rise in numbers of institutionalized elderly. The highest rates of institutional use are found in many of the world's oldest countries, and the absolute numbers of users are expanding even in the face of increasing efforts to enhance community-based services and avoid or greatly reduce levels of institutionalization.

In spite of the intense media scrutiny of and controversy surrounding institutional residence, the fact remains that relatively small proportions of elderly populations reside in institutions at any given time. Cross-national comparisons of institutionalized populations are problematic due to the absence of

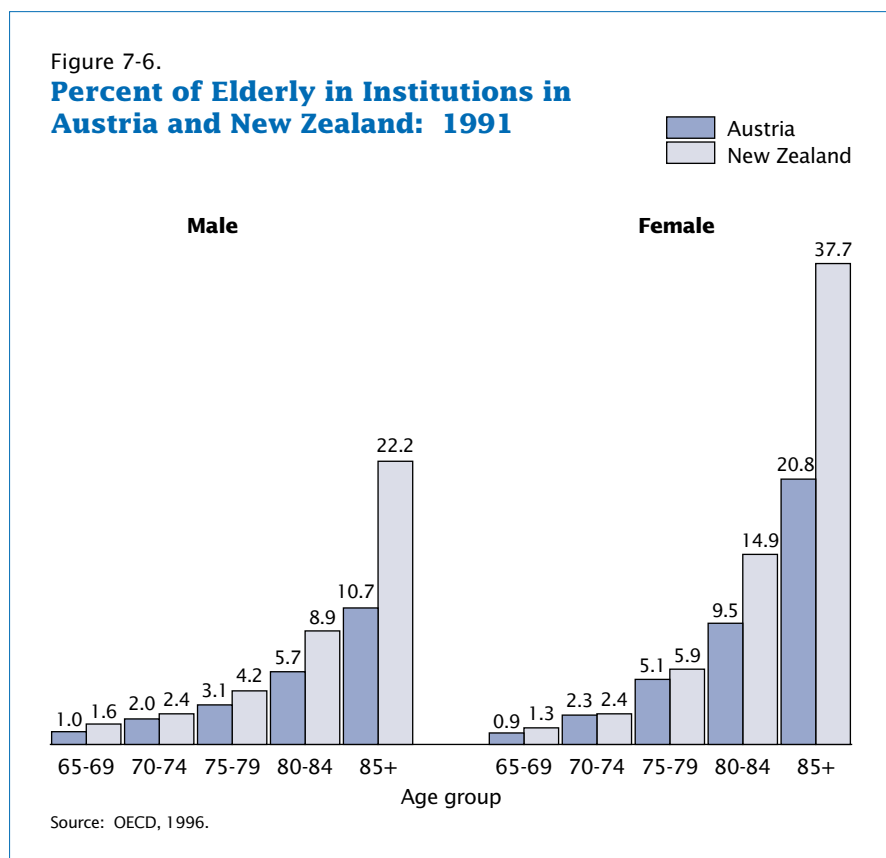
internationally consistent data, and differences between countries should be construed as orders of magnitude rather than as precise measurements. One attempt to collate reasonably-comparative data on residential care in the 1990s (OECD, 1996) suggests that usage rates for developed countries (Figure 7-5) range from 2 percent in Portugal to 9 percent in the Netherlands.¹ There is substantial variation in the use of custodial institutions and in the mix of long-term care alternatives and services (see, e.g., Ribbe et al., 1997; Mechanic and McAlpine, 2000). One study (Doty, 1992) suggests that Japan, Australia, and North America have made greater relative use of medical residential care, while an emphasis on nonmedical facilities has been more apparent in Belgium, Sweden, and Switzerland.

In Eastern Europe and parts of the former Soviet Union, the combination of low fertility and the rapid increase in oldest-old population might be expected to translate into a growing use of institutional health care and maintenance services. To date, however, available information indicates that institutionalization of older people is not common. In Russia, for instance, the capacity of (number of existing places in) old people's homes and nursing homes throughout the former USSR in the late 1980s was estimated to be

¹ Although the percentage of elderly in institutions at any given moment may be relatively low, on average around 5 percent in developed countries, an estimated 25 to 30 percent of people who survive to age 65 can expect to spend some time in an institutional setting before they die (Sundstrom, 1994). Thus the longitudinal risk of experiencing institutionalization is much higher than cross-sectional rates might suggest. Considerable research interest currently is devoted to untangling the dynamics of institutional use, including transitions to and from such facilities and the underlying health conditions that drive the transitions.

between 320,000 (Muzafarov and Kurleutov 1994) and 380,000 (Bezrukov, 1993); the higher estimate represents less than 1.5 percent of the USSR population aged 65 and over as of 1988. While the average Russian view of institutionalization may be extremely negative (Powell, 1991), there does appear to be an unmet need for institutional services. Lengthy waiting lists for institutional admission have been the norm for many years, and official time series data for Russia show a steady rise in the number of nursing/old people's homes, from around 700 in 1985 to more than 900 in 1996. At the same time, the number of places in such institutions has remained fairly constant, suggesting a downsizing of the average facility. Older people living alone, and especially never-married elderly men, are said to be at particularly high risk of institutionalization. In rural areas of the country, district hospitals frequently serve as long-term residences for the elderly, for social as well as health reasons (Bezrukov, 1993).

Rates of institutionalization usually are very low or negligible in the developing world. In official rhetoric, at least, the Western model of institutional care for older people often is rejected as culturally inappropriate (Gibson, 1992). Outside of Europe and North America, social traditions and official decrees of filial and familial responsibility have obviated, at least until recently, debate about living arrangements of the elderly. Lately, however, a number of countries have recognized that even if the family retains much of its support function for the elderly, demographic and socioeconomic changes will inevitably produce strains. Consequently, many developing nations have adopted



new policies aimed at alleviating current and anticipated problems. 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 numbers of potential family caregivers (Phillips, 2000; Bartlett and Wu, 2000).

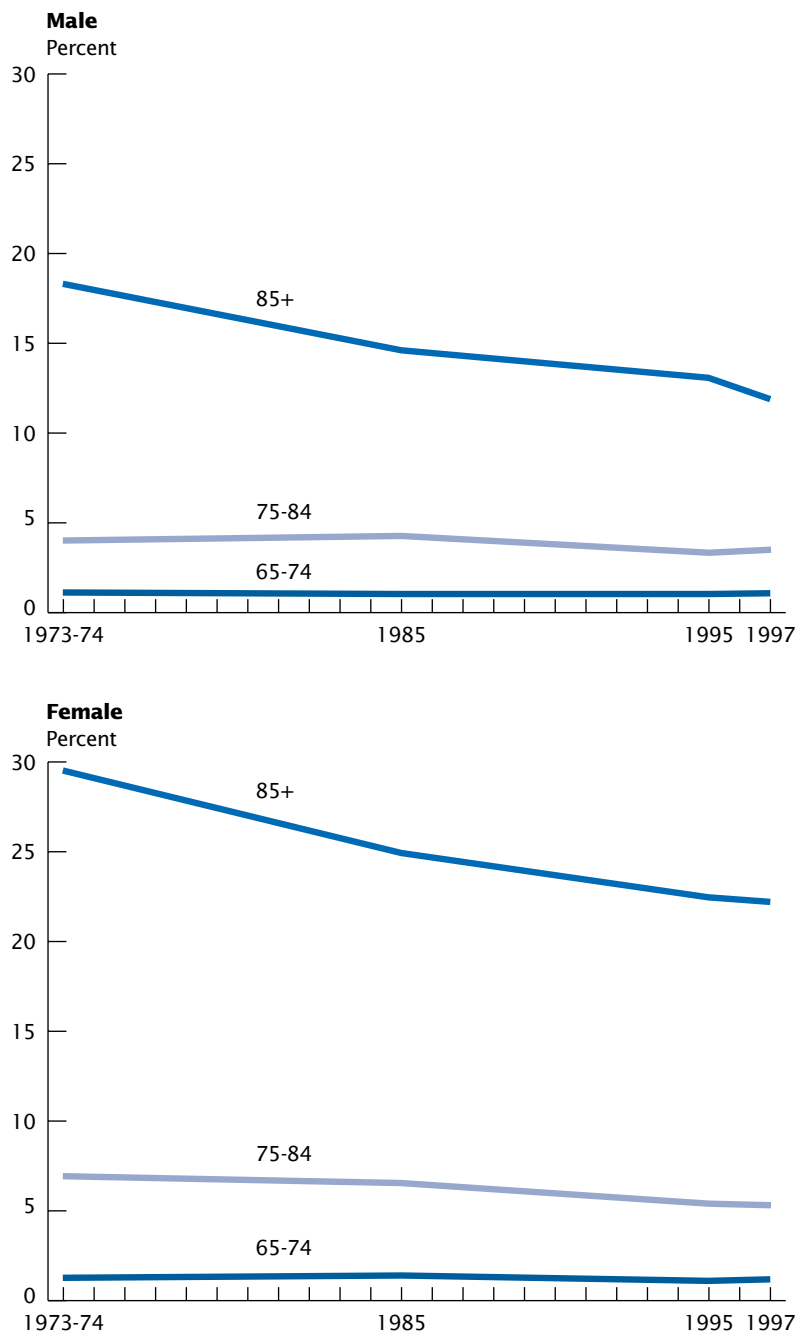
ELDERLY WOMEN PREDOMINATE IN INSTITUTIONAL POPULATIONS

Institutional use is strongly associated with increasing age regardless of national setting (Figure 7-6). In most developed countries, fewer than 2 percent of the young old (aged 65 to 69) are in institutions. This level rises fairly slowly until age 80, but many nations experience a sharp increase in institutionalization rates among

octogenarians. More than half of all Norwegians aged 85 and over reside in institutions at a given point in time, as do one-third or more of this age group in Australia and New Zealand. In fact, a majority of people entering institutions or other types of collective dwellings have reached very advanced age. Those who enter at less-advanced ages tend to be either single or widowed and childless, i.e., people who are unlikely to have young family members to rely upon for support (Soldo, 1987).

Women and the oldest old, therefore, are disproportionately represented among the institutionalized elderly (Figure 7-7). In the United States in 1997, three-fourths of all nursing home residents were women, and slightly more than half of all nursing home residents were aged 85 or older. People in institutions at one point in time, however, do not

Figure 7-7.
Percent of U.S. Elderly in Nursing Homes by Age:
1973-74, 1985, 1995, and 1997



Source: U.S. Centers for Disease Control, 1999.

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 which

discharge a high proportion of users back into the community, while others systems have relatively limited rehabilitative services (Ribbe et al., 1997).

NATURE OF INSTITUTIONAL USE HAS CHANGED

Policies toward and practices of institutionalization of older people in developed countries have changed over the past half-century. In the United States and elsewhere, institutionalization in the early 1900s was generally associated with poverty and/or inability to work. The elderly often were housed with younger “welfare populations” and were supported largely by local agencies. By the middle of the twentieth century, hospital-based care for the elderly had become more common, at least in the United States, with financial and operational control likely to come from state governments. Beginning in the 1950s, social policy encouraged a shift away from hospital use toward nursing-home use. The United States experienced a rapid expansion of nursing home capacity (OECD, 1996), with emphasis on providing for chronic disease and physical disability needs. Federal funding assumed greater prominence, as did private sources of funding. More recently, the private long-term care insurance industry has grown rapidly, while new forms of home and community-based services (e.g., assisted living) have emerged. With U.S. long-term care costs doubling each decade since 1970 (reaching an annual level of \$106 billion in 1995; Stallard, 1998), the mix of institutional and home-based care has been shifting rapidly toward the latter, especially for the oldest old (Cutler and Meara, 1999).

Countries in Europe also have been active in changing long-term care policies and practices in response to population aging. Heightened spending on institutional care prompted Great Britain to revamp legislation in the 1990s, transferring more fiscal control to local governments and tightening means-tested provisions. Austria instituted a new federal act in 1993 aimed primarily at increasing options related to personal care arrangements and supporting individuals in their own homes for as long as possible. Germany, in 1995, unveiled a system of universal long-term care insurance which features expanded benefits without major changes in means-testing. Importantly, the efficacy of such changes will be monitored and evaluated by research projects underway in each country (Wolf, 1998).

As noted above, developed countries vary enormously in their use and view of institutional residency for older citizens. A study (Ribbe et al., 1997) of nursing homes in ten nations found no apparent relation between the level of population aging and the number of nursing home beds. The surprising lack of cross-national consistency is

attributed largely to differences in the organization and financing of long-term care as well as differing sectoral responsibilities for care. Nations clearly are struggling with alternative methods of long-term care financing and provision, and it is hoped that countries can learn from one another via cross-national research that proceeds from the types of efforts now underway in Europe.

BEYOND LIVING ARRANGEMENTS

Living arrangements of older persons clearly are an important component of life, but we should be careful not to infer too much from cross-sectional descriptive data on residence patterns. We need to be aware of how living arrangements change as a function of the growth in elderly populations and their shifting health and kin-availability profiles (Palloni, 2000). And as alluded to earlier, the well-being of individuals is not necessarily reflected in living arrangements. Living alone in old age has sometimes been interpreted as a lack of familial and social integration, when in fact it may be indicative of good health, economic well-being, and social connectedness. Likewise, the

mere fact of elderly coresidence with a younger generation(s) tells us little about the quality of intra-household relationships and life satisfaction.

Instead of focusing on living arrangements per se, attention might better be directed to understanding the complex set of mechanisms and interpersonal relationships that determine the timing and content of support for older persons. This perspective is summed up well by the phrase “function rather than form,” meaning that the mechanisms and characteristics of an individual’s support network are much more salient to well-being (and to policymaking) than are mere attributes of who lives with whom (Hermalin, 1999). Survey research and methodology increasingly are focused on the full mapping of complex kin networks, household and kin microsimulation techniques, and new data-record linkages that allow analysts and policymakers to better understand the underlying dynamics of intergenerational transfers and well-being in old age (Hagestad, 2000; Wolf, 2000). Chapters 8 and 11 look further at family and social support for older persons.

CHAPTER 8.

Family and Social Support of Older People

Shifts in population age structure generally result in new service demands and economic requirements. With an increasingly older age structure comes change in the relative numbers of people who can provide support to those who need it. In the early 1980s, Myers and Nathanson (1982) identified three prominent issues regarding population and the family: 1) the extent to which changes in social norms and responsibilities, driven by the secular processes of urbanization and modernization, alter traditional familial modes of caring for older people; 2) the possible social support burden resulting from reduced economic self-sufficiency of aged people and the likelihood of heightened chronic disease morbidity and functional impairment related to longer life expectancy; and 3) the ways in which countries develop funding priorities for public care systems given competing demands for scarce resources.

To gain a broad view of these dynamics, demographic assessments of intergenerational support often consider various ratios of one age group to another. This chapter considers societal support ratios, parent support ratios, and changes in kin availability. As seen throughout this report, the elderly population is diverse in terms of its resources, needs, and abilities. The stereotype of the elderly as a predominantly dependent group that drains a nation's economy has eroded. Not all elderly require support

and not all working-age people actually work or provide direct support to elderly family members. The statistics discussed in the first part of this chapter may be seen as rough guides to when we can expect the particular age distribution of a country to affect the need for distinct types of social services, housing, and consumer products. These data suggest some of the factors that will shape patterns of social relationships and societal expenditures in the coming decades, but tell us little about the changing nature of the health and economic resources of the aged in the future.

RAPID RISE IN ELDERLY SUPPORT RATIOS EXPECTED IN DEVELOPED COUNTRIES AFTER 2010

Broad changes in a nation's age structure are reflected in changing societal support ratios. These ratios typically indicate the number of youth and/or elderly people per 100 people aged 20 to 64 years, primary ages for participation in the labor force. A commonly used measure of potential social support needs is the elderly support ratio (sometimes called the elderly dependency ratio), defined here as the number of people aged 65 and over per 100 people aged 20 to 64 in a given population. In the coming decades, elderly support ratios will rise in developed countries as a result of both declining fertility and increasing longevity. The rise has been and will continue to be modest in most countries

because the relatively large post-World War II birth cohorts will still be of working age through at least 2010. In several nations (notably the United Kingdom, the United States, and Russia), the elderly support ratio will not change significantly from 2000 to 2010. Some developed nations, however, are aging at a much faster pace. Between 2000 and 2015, the elderly support ratio in Denmark is likely to increase 33 percent (from 24 to 32), and the increase in the Czech Republic will likely be 36 percent (22 to 30). Most notably, Japan's elderly support ratio is expected to jump 63 percent (from 27 to 44) during the 15-year period.

From 2015 to 2030, the elderly support ratio will increase by more than 40 percent in several developed nations as the large working-age cohorts begin to retire. In 2030, Japan's elderly support ratio is projected to be 52 (Figure 8-1). Italy is likely to have an elderly support ratio of 49 in 2030, and nearly all European countries will have elderly support ratios over 40. New Zealand has the lowest projected ratio (30) among the developed nations in this study, with other relatively low figures seen in the United States and Eastern Europe.

ELDERLY SUPPORT RATIOS IN MOST DEVELOPING COUNTRIES TO CHANGE SLOWLY

Elderly support ratios are much lower in developing than in developed countries, often with ten or

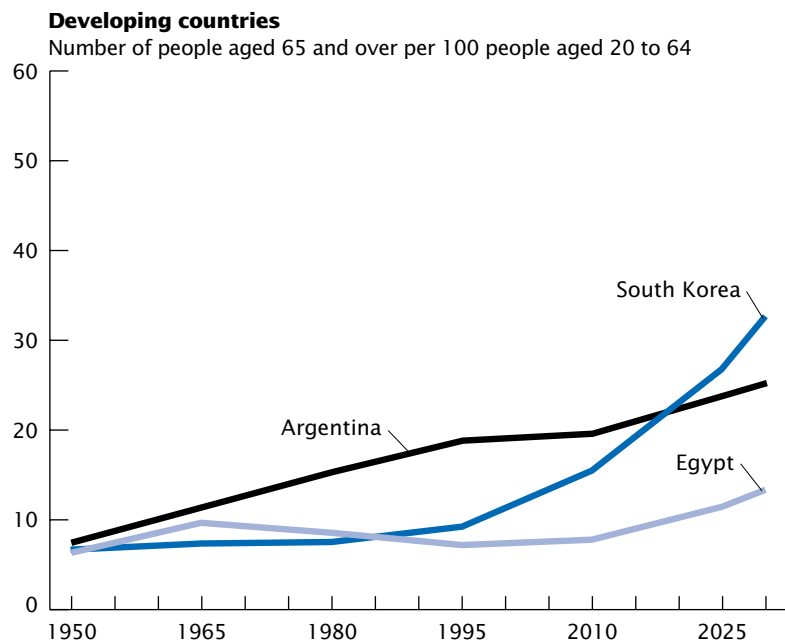
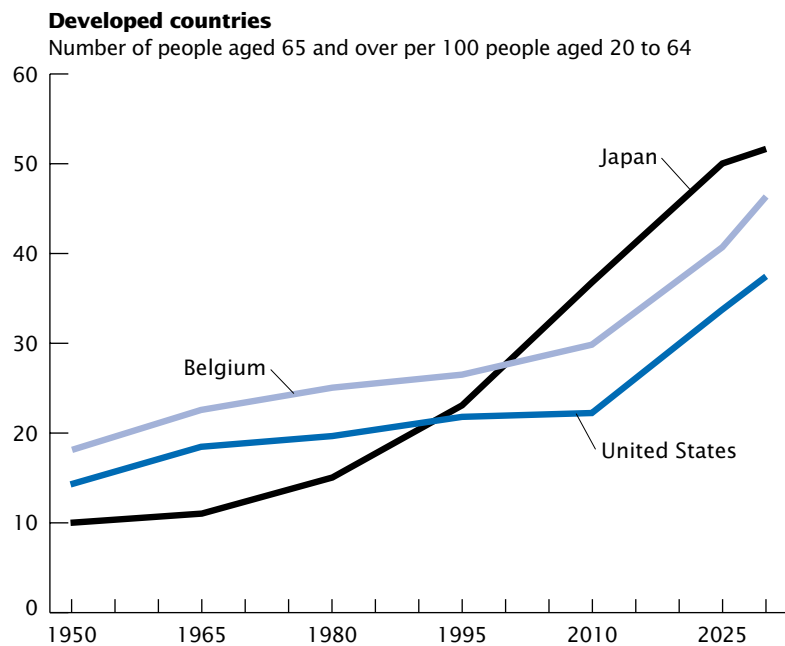
fewer elderly people per 100 people aged 20 to 64. Among the 30 developing countries in this study, Uruguay had the highest level (24) in 2000, followed by Argentina (19) and Israel (18). Many developing countries will experience little if any change in their elderly support ratios from 2000 to 2015, because the high-fertility cohorts of the 1960s and 1970s will still be under age 65 in 2015. Thailand and South Korea stand out as exceptions as they are expected to experience relatively large increases in the ratio between 2000 and 2015. In Bangladesh, Kenya, Malawi, Morocco, and Uruguay, on the other hand, the elderly support ratio is expected to remain stable between 2000 and 2015. In Jamaica and Pakistan the elderly support ratio is projected to decline by 2015, even though the absolute numbers of elderly population are increasing.

In countries where fertility remains high or has just recently begun to decline significantly — as in much of Africa and South Asia — elderly support ratios should change little during the entire period 2000 to 2030. Eastern and Southeastern Asia and parts of Latin America, on the other hand, could witness significant change during that time. The elderly support ratio is projected to at least double between 2000 and 2030 in 11 Asian and Latin American study countries, and to triple in South Korea.

YOUTH SUPPORT RATIOS TO DECLINE

The working-age population also provides support for young people.

Figure 8-1.
Elderly Support Ratios: 1950 to 2030

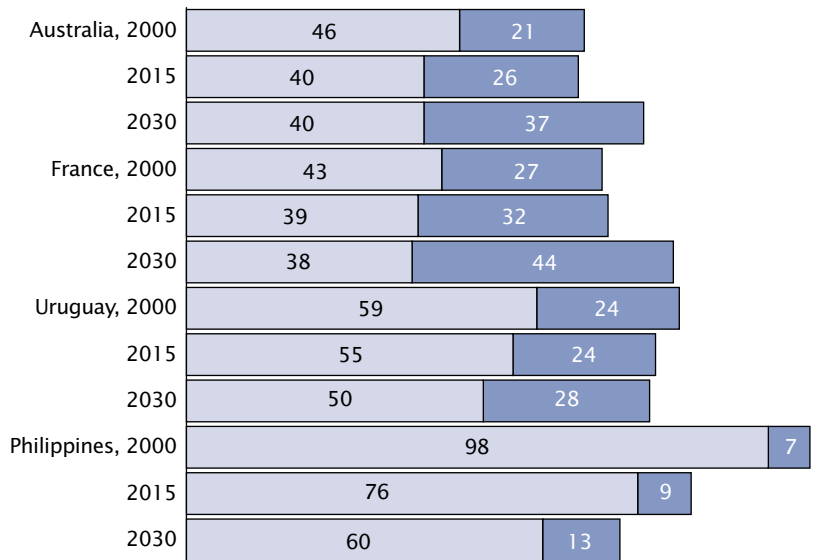


Sources: United Nations, 1999 and U.S. Census Bureau, 2000a.

Figure 8-2.

Youth and Elderly Components of the Total Support Ratio: 2000, 2015, and 2030

(Youth ratio: people aged 0 to 19 per 100 people aged 20 to 64; Elderly ratio: people aged 65 and over per 100 people aged 20 to 64)



Source: U.S. Census Bureau, 2000a.

Children outnumber working-age adults in many developing countries. As a result, youth support ratios — defined here as people under age 20 per 100 adults aged 20 to 64 years — for 2000 were in excess of 100 in several developing countries (mainly in Africa). In the developed countries in this study, however, youth support ratios ranged from only 31 in Italy to 49 in New Zealand.

In most countries of the world, youth support ratios are projected to decline between 2000 and 2030. In countries where the present level is high, the youth support ratio may decline by half or more. In Kenya, for example, the 2000 level of 133 is projected to plummet to 61 in 2030.

DIVERGENT TOTAL SUPPORT RATIO PATTERNS IN DEVELOPED VERSUS DEVELOPING COUNTRIES

The total support ratio (youth plus elderly in relation to the working-age population) provides a gross indication of the overall support burden on working-age adults. The level of the total support ratio over time is pertinent to policymakers, but knowing the balance of old versus young may be more important because supporting the young is probably less costly than supporting the elderly (especially as the elderly population itself ages). With the major exception of education, the costs of young people are borne by families more than by government programs, although some European governments provide the

bulk of support to both young and old alike.

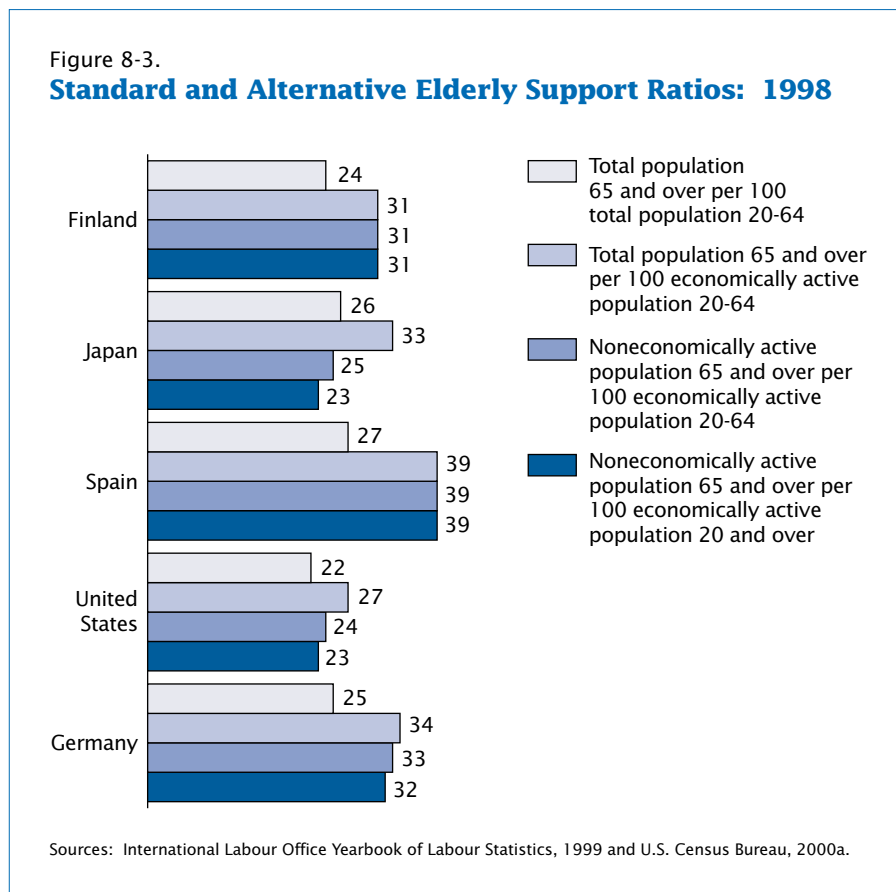
From 2000 to 2015, the total support ratio (TSR) should remain relatively stable in most developed countries as declining numbers of children more than offset growing numbers of elderly (Figure 8-2). From 2015 to 2030, however, increasing numbers of elderly people will boost the TSR in all developed nations even though the youth component may decline slightly. Among the study countries, the proportional gain in the TSR from 2015 to 2030 is projected to be greatest in Russia (30 percent). The United States is projected to have the highest TSR (87) among the developed countries in the year 2030, with 7 other developed countries also projected to have TSRs in excess of 80.

For the foreseeable future in developing countries, major fertility reductions are likely to outweigh growing numbers of elderly people. At the same time, the working-age population is increasing. Hence, future TSRs for the vast majority of developing countries are projected to be lower than in 2000. Even though growth rates for the youth and elderly will be higher than in developed countries during the next three decades, TSRs in developing countries often will be lower because of the massive numbers of working-age adults in their populations. Such change may portend a window of economic opportunity for developing countries. As the ratio of working-age to total population rises, economies have relatively more productive units and therefore more opportunity to grow (other factors being equal).

THE USEFULNESS OF ELDERLY SUPPORT RATIOS

Implicit in the standard definition of an elderly support ratio is the notion that all people over age 64 are in some sense dependent on the population in the working ages (20 to 64) who provide indirect support to the elderly through taxes and contributions to social welfare programs. We know, of course, that elderly populations are extremely diverse in terms of resources, needs, and abilities, and that many elderly are not dependent in either a financial or a physical (health) sense. Older people pay taxes, often have income and wealth that fuel economic growth, and provide support to younger generations. Likewise, substantial portions of the working-age population may not be financial earners, for reasons of unemployment, inability to work, pursuit of education, choosing to be out of the labor force, and so forth.

While it is empirically difficult to include factors such as intrafamily financial assistance and child care activities into an aggregate measure of social support, it is feasible to take account of employment characteristics in both the working-age and elderly populations. In Figure 8-3, the topmost bar for each country represents the standard elderly support ratio as defined above. The second bar includes only the economically active population aged 20 to 64 in the denominator, thereby excluding people who choose not to work, unpaid household workers, nonworking students, and perhaps those 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 elderly to the ratio denominator of other economically active individuals, on the assumption that these working elderly continue to contribute tax revenue to national coffers.

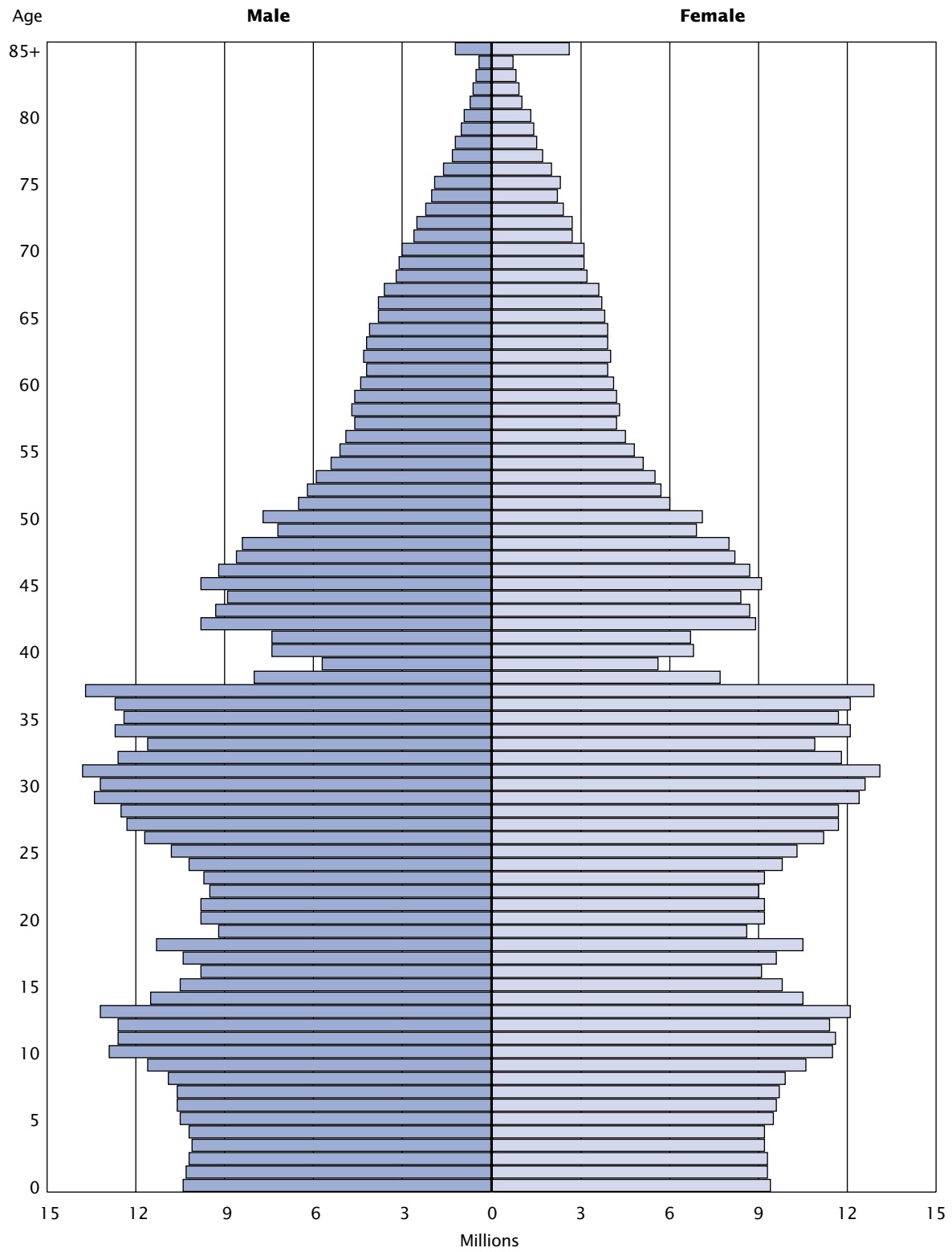
The alternative ratios in each country are higher than the standard elderly support ratio, except in Japan where the elderly have a relatively high rate of labor force participation (often as part-time workers). To the extent that policy and program agencies use support ratio calculations, the effect of including versus excluding labor force participation rates appears considerable in most countries. Data permitting, other adjustments might be made to these ratios to account for such

factors as (1) workers under age 20; (2) trends in unemployment; (3) average retirement ages; and (4) levels of pension receipt and institutionalization among the elderly, and/or the prevalence of high-cost disabilities.

RAPIDLY CHANGING AGE STRUCTURE IS A CHALLENGE TO SUPPORT IN SOME DEVELOPING COUNTRIES

One of the more dramatic demographic developments in the last two decades has been the pace of fertility decline in many developing countries. The common perception is that below-replacement fertility levels are seen only in the industrialized nations of the Northern Hemisphere. As of 2000, however, the total fertility rate was below replacement level in 21 developing countries, mostly in Latin America

Figure 8-4.
Population by Single Years of Age for China: 2000



Source: U.S. Census Bureau, 2000a.

and the Caribbean and parts of Asia (U.S. Census Bureau, 2000a), and is declining steeply in many other developing countries.

The situation in the People's Republic of China illustrates the potential effect that rapidly-declining fertility may have vis-a-vis population aging. In 1979, China established an official one-child-per-family policy aimed at curbing growth in the world's most populous nation. While the policy was relaxed somewhat in subsequent years, China's total fertility rate declined to an estimated level of 1.8 children per woman in 2000. As a result, China will age sooner and more quickly than most developing countries.

China's age profile in 2000 contained a large "bulge" consisting of people aged 26 to 37 (Figure 8-4). The oldest people in this age bulge will be entering their sixties just prior to the year 2025. This population momentum will produce a rapid aging of the Chinese population in the third and fourth decades of the twenty-first century. Recent analyses of 1995 sample census data from China suggest higher old-age mortality than had been previously estimated, resulting in lower numbers of projected elderly people. Nevertheless, the number of Chinese aged 65 years and over is now projected to increase from 88 million in 2000 to 197 million in 2025, and to 341 million in 2050. Short of a catastrophic rise in adult mortality or massive emigration of an unprecedented scale, we can be reasonably certain that this growth will occur, because the elderly of the middle decades of the twenty-first century are already born. Eventually, China's projected youth and elderly support ratios are likely

Figure 8-5.
Youth and Elderly Support Ratios in China: 1985 to 2050

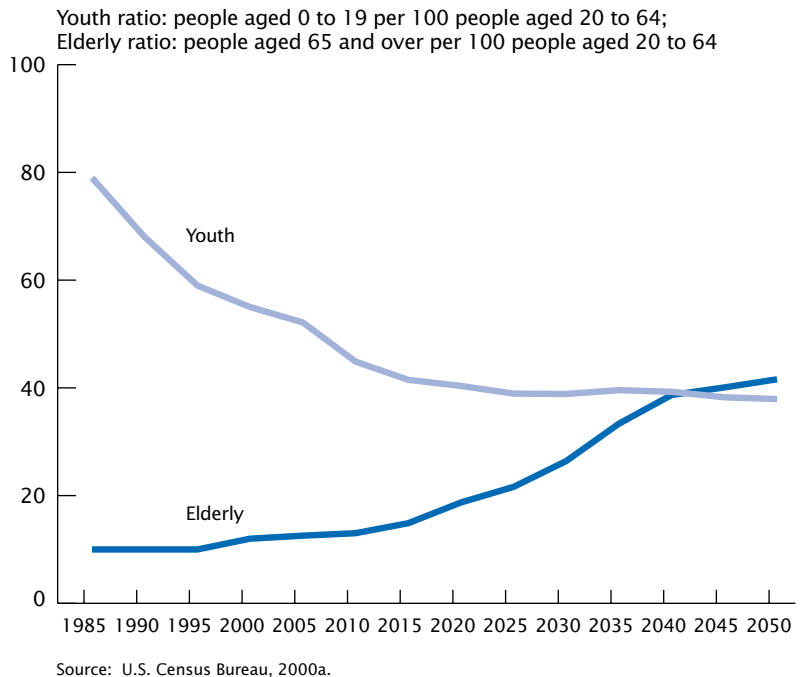
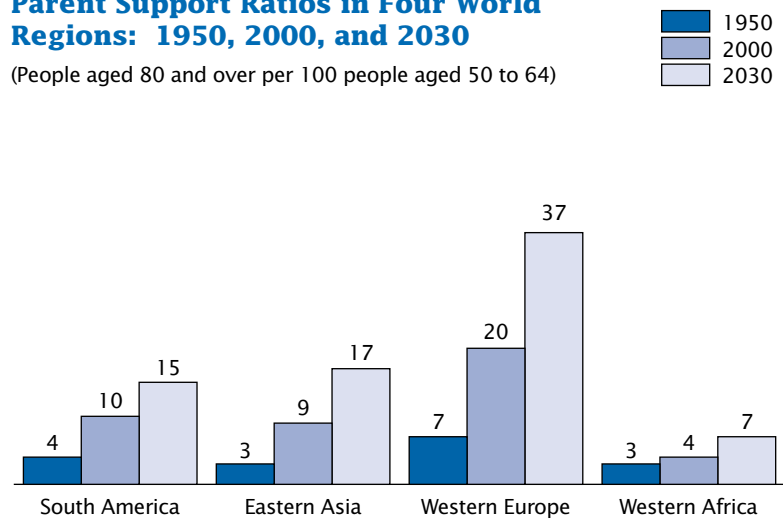


Figure 8-6.
Parent Support Ratios in Four World Regions: 1950, 2000, and 2030

(People aged 80 and over per 100 people aged 50 to 64)



Note: South America includes: Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, French Guiana, Guyana, Paraguay, Peru, Suriname, Uruguay, and Venezuela.
Eastern Asia includes: China, North Korea, South Korea, Hong Kong, Japan, Macau, Mongolia, and Taiwan
Western Europe includes: Austria, Belgium, France, Germany, Liechtenstein, Luxembourg, Monaco, Netherlands, and Switzerland.
Western Africa includes: Benin, Burkina Faso, Cape Verde, Cote d' Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, St. Helena, Senegal, Sierra Leone, and Togo.

Sources: United Nations, 1997 and U.S. Census Bureau, 2000a.

to converge (Figure 8-5), and we may anticipate a social and economic fabric radically different from that of today.

MORE PEOPLE WILL FACE CARING FOR FRAIL RELATIVES

In the eighteenth and nineteenth centuries, low levels of life expectancy meant that people on average lived a relatively short amount of time in a multigenerational family (United Nations, 1990b). While most older individuals lived with family members, years spent in an extended-family arrangement were limited because the average person died shortly after becoming a grandparent (Hareven, 1996). Declining mortality and increased longevity have increased the odds of joint survival of different generations within a family. In developed countries, joint survival has manifested itself in the “beanpole family,” a vertical extension of family structure characterized by an increase in the number of living generations within a lineage and a decrease in the number of members within each generation (Bengston, Rosenthal, and Burton, 1995). As mortality rates continue to improve, more and more people in their fifties and sixties are likely to have surviving parents, aunts, and uncles. More children will know their grandparents and even their great-grandparents, especially their great-grandmothers. There is no historical precedent for a majority of middle-aged and young-old adults having living parents. Menken (1985) has estimated that one in three women 50 years old had living mothers in the United States in 1940, whereas by 1980 the proportion had doubled to two in three.

SANDWICH GENERATION A DEVELOPED-COUNTRY PHENOMENON

One aspect of the changing age structure of families that has received recent attention is the so-called “sandwich generation,” that is, people who find themselves caring for elderly parents while still caring for/supporting their own children or grandchildren and often participating in the labor force. In developed countries especially, more people will face the concern and expense of caring for their very old, frail relatives with multiple, chronic disabilities and illnesses. The need for help is likely to come at the very time when the adult children of the frail elderly are near or have reached retirement age.¹ In developing countries, the adult children may well have children of their own living in the household. Some of the adult children may bear health limitations of their own. Those frail elderly without children may face institutionalization at earlier ages than will people with surviving adult children.

One measure of the pressure the sandwich generation may experience by caring for elderly parents is the parent support ratio (PSR), defined here as the number of people aged 80 and over per 100 people aged 50 to 64, which in a general sense relates the oldest old to their offspring who were born when

¹ It should be noted that the idea of a “sandwich generation” needs further empirical elucidation. Some researchers question the extent to which middle generations actually provide care for younger and older generations. One study of 12 European Union countries (reported in Hagestad, 2000) reports that only 4 percent of men and 10 percent of women aged 45-54 have overlapping responsibilities for children and for older persons who require care. The importance of the “sandwich” concept in a given society is likely to be determined, in part, by the nature of formal institutions that provide assistance to elderly individuals and to families in general.

most of the oldest old were aged 20 to 35. Of course, people in the numerator (80 and over) are not necessarily in the same families as those in the denominator (50 to 64 years). Thus, the PSR is only a rough indication of need for family support over time.

Relatively few people aged 50 to 64 in 1950 worried about caring for people aged 80 or older. In the developed countries in this study, the PSR ranged from five in Japan and Hungary to eleven in Norway in 1950. In developing countries, the PSR ranged from two in Bangladesh to eleven in Tunisia and Uruguay. Increases in the PSR since 1950 imply that a relatively larger share of middle-aged adults now may expect to provide care. Additionally, life expectancy has increased for the disabled, the mentally retarded, and the chronically ill. Today’s care for older people may be more physically and psychologically demanding than in the past, especially with regard to the increased numbers of people with cognitive diseases. As advances in medical technology affect the ability to extend life, it is at least plausible to expect the duration of chronic illness and the consequent need for help to increase further, even if the average age at onset of disability rises.

In all countries examined except Bangladesh, Jamaica, Morocco, and Pakistan, the PSR is projected to be higher in 2030 than in 2000. The ratio has and will evolve very differently within and among world regions, however (Figure 8-6). In South America, Eastern Asia, and Western Europe, PSRs more than doubled between 1950 and 2000. PSRs will continue to rise between 2015 and 2030. In Western Africa, most countries experienced little

change in the PSR from 1950 to 2000, and the aggregate level will remain low in 2030 even though absolute numbers of oldest-old people in some nations are growing rapidly. The most pronounced changes have occurred in the industrialized world. In 2000, the PSR was 20 or higher in 12 such nations (and also in Israel and Uruguay). The difference in parent support ratios between developed and developing countries reflects different trends in fertility. In 2030, those aged 50 to 64 (the potential support givers) were born between 1966 and 1980. In most developing countries, fertility was still high during this period, or just beginning to decline. Hence, this age group will be fairly large, resulting in low parent support ratios. In developed countries, fertility was fairly low during this period, producing small birth cohorts that will result in higher parent support ratios in 2030.

SPOUSE MAY BE MOST LIKELY TO PROVIDE CARE FOR ELDERLY

A clear cross-national picture of caregiving for the elderly has yet to emerge. In the 1980s, the stereotypical view of caregiving was that of children caring for their aged parent(s). More specifically, it generally was thought that adult daughters and daughters-in-law provided most of the personal care and help with household tasks, transportation, and shopping for the elderly (United Nations, 1985). Although this may still be the case, increases in joint survival mean that, for many older people in both developing as well as developed countries, the main person who provides care is their spouse (Shuman, 1994). One survey in Spain found that 74 percent of

older men who were receiving assistance with an instrumental activity of daily living² had their wife as the caregiver. However, only 33 percent of older women relied on their husband as the caregiver, while 58 percent were aided by a daughter (Beland and Zunzunegui, 1996).

Whether in the role of spouse or daughter, the fact remains that women provide the bulk of informal and/or long-term care for elderly people worldwide. While joint survival increases the number of elderly couples, the average woman eventually outlives her husband and may have to rely on other family members for personal care.³ Most studies (see, for example, Jenson and Jacobzone, 2000, and the compilation of research in Blieszner and Bedford, 1996) have indicated that these other family members are women. Therefore, a variant of the parent support ratio may be useful, namely, the ratio of people aged 80 and over to women aged 50 to 64. Changes in this parent support ratio for females (PSRF) are similar to those in the PSR, but the PSRF levels are much higher. In 2000, the PSRF was 54 in Norway and Sweden, the highest level among the 52 study nations. Most developed countries had PSRF levels in the 30s and 40s, while many developing nations had PSRFs of 15 or less in 2000. Projections for the year 2030 suggest that in Japan there will be 100 people aged 80 and over per 100 women aged 50 to 64, the highest level among the 52 nations.

² Instrumental activities of daily living include preparing meals, shopping for personal items, managing money, using the telephone, and doing light housework.

³ Although, in countries with relatively high levels of income, market developments increasingly allow older individuals or their children to purchase care services directly if desired.

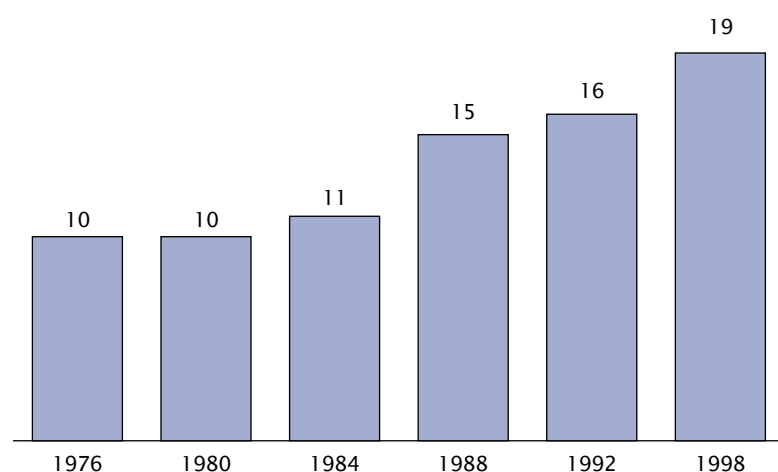
FAMILY ABILITY TO CARE FOR ELDERLY MEMBERS MAY BE CHANGING

Living with other people reduces the likelihood of using formal medical care and increases the use of informal care, at least in the U.S. context (Cafferata, 1988). Since most physical, emotional, and economic care to older individuals is provided by family members, the demography of population aging is increasingly concerned with understanding and modeling kin availability. Kin availability refers to the number of family members who will potentially be available to elderly individuals if and when various forms of care are needed. A study by Tomassini and Wolf (2000) examined the effects of persistent low fertility in Italy on shrinking kin networks for the period 1994-2050; throughout the simulation period, about 15-20 percent of Italian women aged 25 to 45 are the only living offspring of their surviving mothers and thus are potentially fully responsible for their mothers' care. While reduced fertility and smaller families obviously imply fewer potential caregivers, this effect is offset to some extent by increased longevity. Modeling is further complicated by the fact that while demographic forces impose constraints on family, household, and kin structures, these structures also are determined by social and cultural factors that are difficult to measure (Myers, 1992; Wolf, 1994; Van Imhoff, 1999).

Research is now addressing whether the high rates of divorce observed in some nations will result in a lack of kin support for people in older age, and whether "blended" families and other forms of social arrangements will, in the future, provide the types of care and

Figure 8-7.
Childlessness Among U.S. Women 40 to 44 Years Old: 1976 to 1998

(Percent)

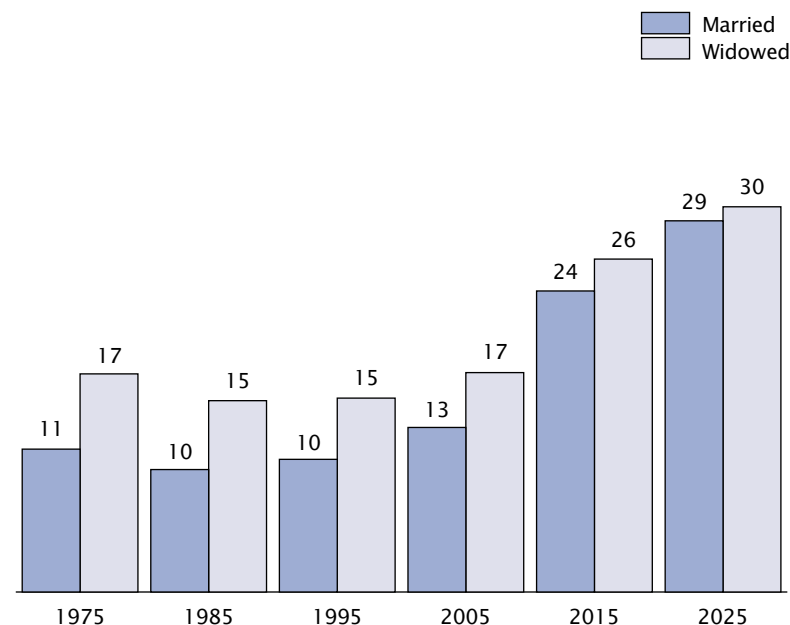


Source: U.S. Census Bureau, June Current Population Surveys, 1976 to 1998.

support that are common today (Wachter, 1998; Murphy, 2001). The consensus to date foresees a declining biological kinship support network for elderly people in developed and many developing countries. Childlessness is another trait that will affect the nature of future caregiving. Data over time for the United States in Figure 8-7 show the increasing likelihood of being childless among women aged 40 to 44; nearly one out of five such women in 1998 had no children. Trends in this characteristic could be an important determinant of eventual care arrangements as current and future cohorts of middle-aged women reach older age.

The issue of kin availability has become especially important in the context of East and Southeast Asian countries, driven in large part by the rapid declines in fertility that have greatly reduced the average family size of young-adult cohorts. The complex interplay of demographic and cultural factors is illustrated by the case of the Republic of Korea. There, two-thirds of the elderly are economically dependent on their adult children (Korea Institute for Health and Social Affairs, 1991), and cultural norms dictate that sons provide economic support for elderly women who have lost their spouses. Lee and Palloni (1992) have shown that declining fertility means an increase in the proportion of Korean women with no surviving son (Figure 8-8). At the same time, increased male longevity means that the proportion of elderly widows also will decline. Thus from the elderly woman's point of view, family status may not

Figure 8-8.
Percent of Women at Age 65 in South Korea With No Surviving Son: 1975 to 2025

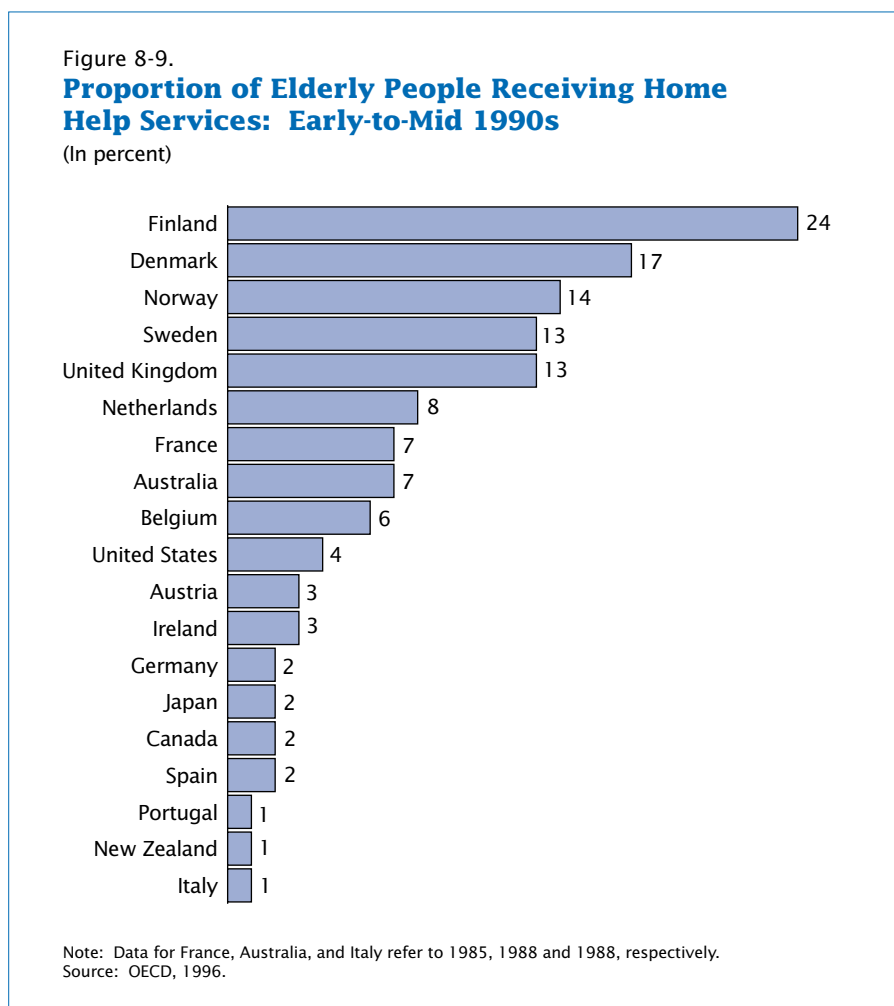


Source: Lee and Palloni 1992.

deteriorate significantly in the coming years. From society's perspective, however, the demand for support of elderly women is likely to increase. The momentum of rapid population aging means that the fraction of the overall population that is elderly women (especially sonless and childless widows) will increase among successive cohorts. Given the strong trend toward nuclearization of family structure in the Republic of Korea, and the traditional absence of state involvement in socioeconomic support, the future standard of living for a growing number of elderly widows is tenuous. A similar prospect looms in Taiwan and Japan (Hermalin, Ofstedal, and Chi, 1992; Jordan, 1995). Simulations of kin availability in rural China (Jiang, 1994) are more optimistic, suggesting that, in spite of relatively low fertility, improvements in mortality will ease the future burden on the family support system. Only a very small percentage of rural households will have to support two or more elderly parents, and relatively few elderly will be childless. At the same time, simulations using family-status life table models developed by Zeng, Vaupel, and Zhenglian (1997; 1998) suggest that the family household structure and living arrangements of Chinese elders may change markedly during the first half of this century; by 2050, the percentage of Chinese elderly living alone could be 11 and 12 times larger in rural and urban areas, respectively, than in 1990.

HOME HELP SERVICES ARE MOST PREVALENT IN SCANDINAVIA

The previous chapter alluded to a change in social and governmental thinking about the desirability of institutionalization. Some nations



now promote policies to maintain and support frail elderly people in their own homes and communities for as long as possible. Given the changing nature of the family (in its many perturbations) and patterns of kin availability, the development and use of home help services would appear to be a reasonable step toward reducing the need for institutionalization. To date, however, the use of home help appears to be widespread only in Scandinavian countries and the United Kingdom. Comparative data assembled by the Organization for Economic Co-Operation and Development from the early-to-mid-1990s show that the proportion of elderly people receiving home help exceeds 10 percent in only five

countries (Figure 8-9). Such services reached nearly one-fourth of all elderly in Finland in 1990, up slightly from the level of 22 percent in 1980. The available data suggest that countries with more extensive provision of home help services are those that have had a prolonged process of population aging and now have relatively higher proportions of oldest-old residents (OECD, 1996). Structural programmatic factors also are important, insofar as government support or subsidization of home help will almost certainly result in greater use. In the United States, the use of home health care services has grown substantially since the late 1980s, largely as a result of changes in medicare policy that

have made home health benefits available to more beneficiaries for longer periods of time. This in turn has stimulated the home health care industry; the number of home health agencies more than tripled between 1980 and 1994 (Freedman, 1999).

ELDERLY PROVIDE AS WELL AS RECEIVE SUPPORT

Many elderly receive financial help from adult children, but support is not a one-way street. In countries with well-established pension and social security programs, many older adults give support (including financial help, shelter, childcare, and the wisdom of experience) to their adult children and grandchildren. In the North American context, studies suggest that elderly parents are more likely to provide financial help than to receive it (Soldo and Hill, 1993; Rosenthal, Martin-Matthews, and Matthews, 1996). The elderly in developing countries appear less likely than in developed countries to provide financial help; data from the Malaysian Family Life Survey indicate that the main direction of monetary transfers between noncoresident parents and children is from the latter to the former (Lillard and Willis, 1997). Ongoing research in Asia is beginning to reveal the complexity of familial exchange, not just among parents and children but among wider family and social networks as well (Agree, Biddlecom, and Valente, 1999). Beyond the financial realm, it seems clear that older persons in developing countries make substantial contributions to family well-being, in ways ranging from socialization to housekeeping and child care. Such activities free younger adult women for employment in unpaid family help in agricultural

production as well as paid employment (Hashimoto, 1991; Apt, 1992).

An important component of many older people's lives is their role as the giver of care. Older people provide care for a variety of people (spouses, older parents, siblings, children, and grandchildren) and do so for many reasons (illness of a spouse or sibling, increased number of single-parent families, increased female labor force participation, orphaned grandchildren). Often the care provided by older family members is essential to the well-being of a family.

THE IMPORTANCE OF GRANDPARENTS

In some countries, nontrivial proportions of older women and men are providing care to their grandchildren. This care ranges from occasional babysitting to being a custodial grandparent. Survey data for the United States from the mid-1990s (Fuller-Thomson and Minkler, 2001) indicate that 9 percent of all Americans with grandchildren under age 5 were providing extensive caregiving.⁴ In 1997, 3.9 million children (5.5 percent of all children under age 18) lived in a household maintained by their grandparents (Casper and Bryson, 1998). Since 1990, the number of children living in households headed by grandparents has increased, especially for children in households with only grandparents and grandchildren. Trends in several factors (e.g., divorce, HIV/AIDS, drug abuse, and child abuse) may have contributed to the increase in these types of families.

⁴ Extensive caregiving in this context meant providing at least 30 hours of child care in an average week and/or caring for grandchildren for at least 90 nights in 1 year.

Grandparents in some developed countries often provide day care for children so the grandchildren's parents can work or go to school. In the United States in 1995, 29 percent of preschool children whose parent(s) worked or were in school were cared for by a grandparent (Smith, 2000), typically the grandmother. Because of the lack of adequate day care in many Eastern European countries and nations of the former Soviet Union, the care that grandmothers (babushkas) provide for grandchildren may be integral to family functioning.

In many Asian countries, where coresidency is the norm, proportions of grandparents providing care for grandchildren are substantial. In the Philippines, Thailand, and Taiwan, approximately 40 percent of the population aged 50 and older lived in a household with a minor grandchild (under 18 years of age). In these same countries, approximately half or more of those aged 50 and older who had a coresident grandchild aged 10 or younger provided care for the child (Hermalin, Roan, and Perez, 1998). As in the United States, grandmothers are more likely than grandfathers in Asian countries to provide care for their grandchildren (Chan, 1997; Uhlenberg, 1996).

Many grandparents find themselves in the position of going beyond providing occasional care to becoming the sole providers of care for their grandchildren. One reason for this situation is the migration of the middle generation to urban areas to work. Past research has found that this is not unusual in Afro-Caribbean countries (Sennott-Miller, 1989). These "skip-generation" families are found in all regions of

the world and may be quite prevalent. One study in rural Zimbabwe found that 35 percent of households were skip-generation households (Hashimoto, 1991).

THE HIV/AIDS EPIDEMIC IS CHANGING GRANDPARENTS' ROLES

The AIDS epidemic has affected the number of grandparents who are caring for grandchildren in many countries of the world. The effects

of the epidemic are particularly devastating in Sub-Saharan Africa, where it is estimated that in 1999 8.6 percent of the population aged 15 to 49 was infected with an HIV virus that causes AIDS. High rates of adult infection and AIDS deaths leave many children in need of care. The cumulative number of AIDS orphans⁵ in Sub-Saharan

⁵ AIDS orphans are defined as HIV-negative children who lost their mother or both parents to AIDS when the children were under age 15.

Africa is estimated to be 12.1 million (UNAIDS/WHO 2000). For many of these children, grandparents have become the main caregiver (Levine, Michaels, and Back, 1996). One study (Ryder et al., 1994) in the city of Kinshasa found that the principal guardian for 35 percent of AIDS orphans was a grandparent.

CHAPTER 9.

Educational Attainment and Literacy

Educational attainment is linked to many aspects of a person's well-being. Research has shown that higher levels of education usually translate into better health status, higher incomes, and consequently higher standards of living (Guralnik et al., 1993; Preston and Taubman, 1994; Smith and Kington, 1997; Liu, Hermalin and Chuang, 1998).

People with higher educational levels tend to have lower mortality rates and better overall health than their less-educated counterparts (Elo and Preston, 1996; Zimmer et al., 1998), as well as better cognitive functioning in older age (Stern and Carstensen, 2000). Part of the reason for this finding is that more-educated people tend to have higher incomes throughout their lifetime, which means they can afford better health care than people with lower levels of education. Higher working-life income also translates into higher levels of retirement savings and income. Hence, people with higher educational levels may be less dependent on their family for financial assistance in later years.

Education significantly affects how effectively people utilize health care. In the United States, for example, where educational levels of the elderly are relatively high, many older people, especially those aged 85 and older, have trouble understanding basic medical instructions. Even something as simple as taking medicine correctly may be a problem. Education further affects health because well-educated people may be more

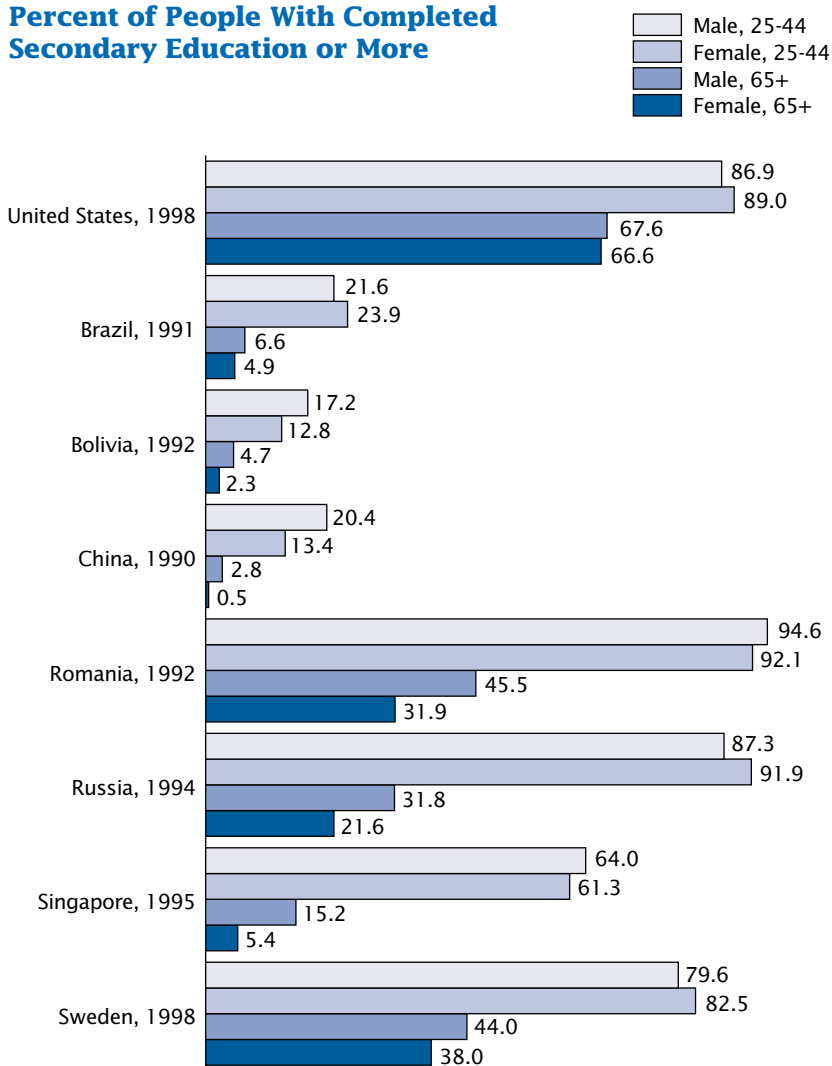
aware of the benefits and disadvantages of certain types of behaviors associated with personal health. Education also is related to joint survival of spouses, to living arrangements, and to changing value systems which have

implications for intergenerational solidarity (Choi, 1992).

Educational attainment of the elderly varies substantially among the countries in this report. The latest data for the United States show

Figure 9-1.

Percent of People With Completed Secondary Education or More



Note: Data for Sweden 65+ refer to ages 65-74.
Sources: U.S. Census Bureau, 2000a and national sources.

that two-thirds of all people aged 65 and older had completed at least secondary education.¹ Comparable completion levels in other developed countries are somewhat lower. Less than a third of the elderly in Russia, for example, had finished secondary-level education (Figure 9-1). Levels of education of the elderly are much lower in developing countries. In Brazil, Bolivia, and China, less than 5 percent of the elderly population had a completed secondary education.

FUTURE ELDERLY WILL HAVE MORE EDUCATION

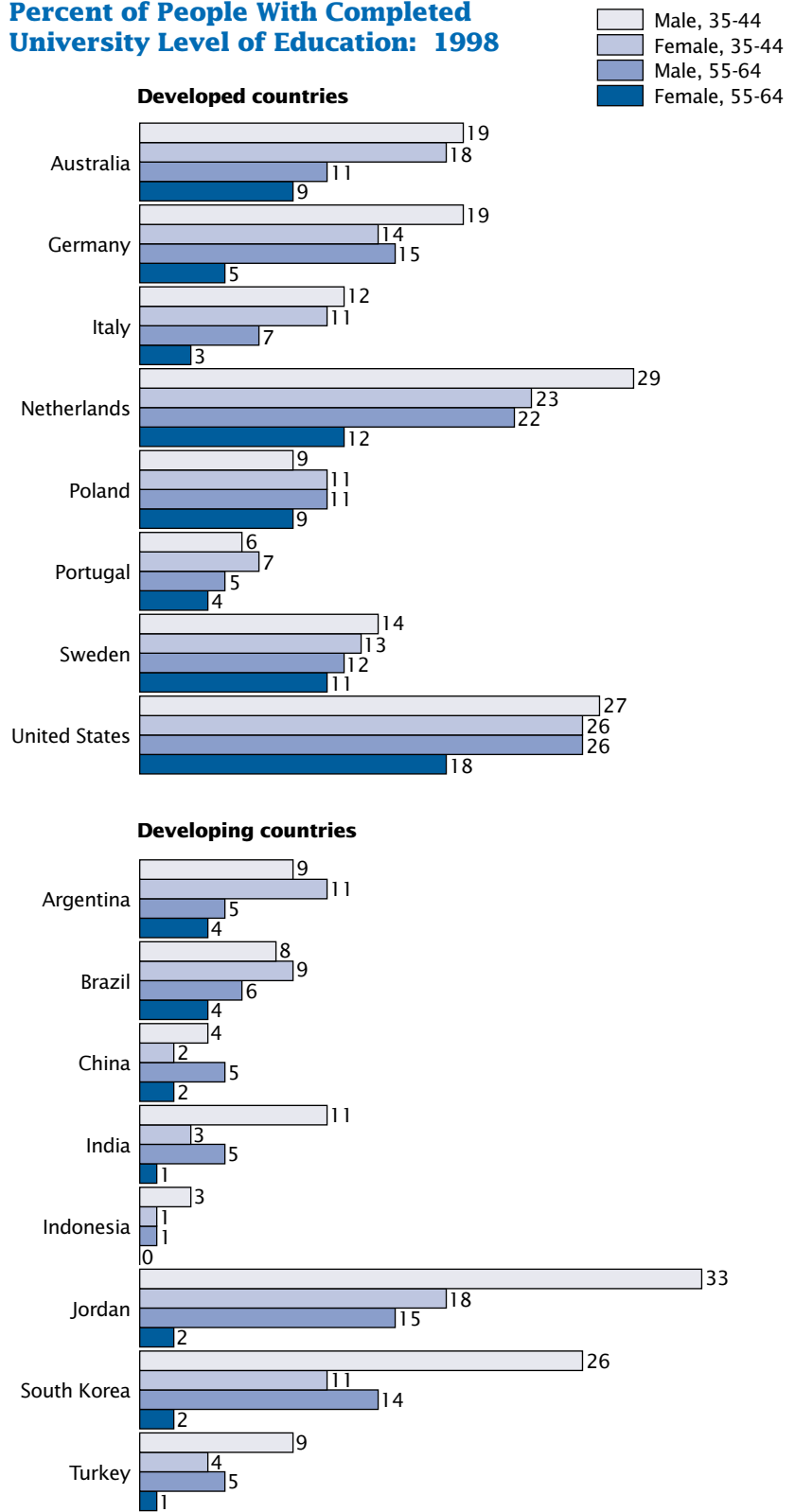
During the twentieth century, educational attainment has increased markedly in most countries of the world. This improvement is clearly reflected in the data on educational attainment by age. In some developed countries, younger cohorts are more than twice as likely as the elderly to have completed secondary education. In developing countries, the difference between younger and older cohorts is even more striking. Women aged 25 to 44 in Bolivia were more than five times as likely as women aged 65 and older to have a completed secondary education.

The educational attainment of the elderly has risen during the last several decades in many countries, and will continue to increase in the future. For example, around 27 percent of the elderly in the United States had completed at least secondary education in 1970; by 1998 the percentage had

¹ Educational attainment in this report refers in theory to completion of a particular educational level. Data have been derived from primary national tabulations as well as from figures reported to international organizations. While large differences in educational attainment exist, at least some of the variation is likely due to different concepts, definitions, and methods of data collection. We have attempted to make the data on educational attainment in this report as comparable as possible across countries.

Figure 9-2.

Percent of People With Completed University Level of Education: 1998

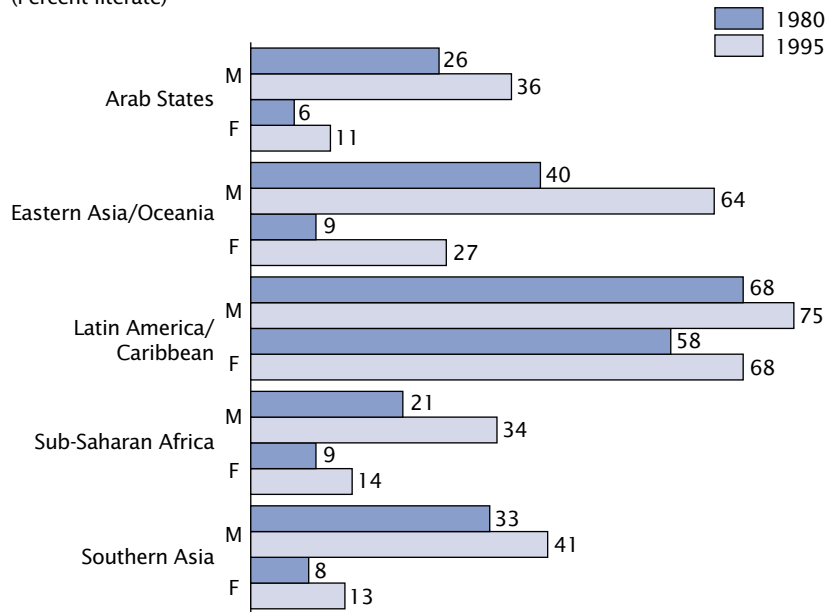


Note: Percent for females aged 55-64 in Indonesia is zero.
Source: Organization for Economic Co-Operation and Development, 2001.

Figure 9-3.

Estimated Literacy Rates for Population Aged 60 and Over, by Sex, in Five Developing Regions: 1980 and 1995

(Percent literate)



Source: United Nations Educational Scientific and Cultural Organization, 1995.

jumped to 67 percent. As younger, more-educated cohorts continue to age, their attainment levels will be reflected in the educational status of tomorrow's elderly.

UNIVERSITY EDUCATION NOT YET THE NORM AT ANY AGE

Although educational attainment has been improving throughout the twentieth century, university-level education still is not widespread. Relatively few people complete this level of education and the proportion is usually lowest among the elderly. In many developed countries, less than a third of people aged 35 to 44 have a university education (OECD, 1998a; 2001). The proportion of the "near elderly" (i.e., aged 55 to 64) with this level of education is even lower (Figure 9-2). For the set of countries included in this graph, among men aged 55 to 64, the proportion with a university education ranged from

5 to 25 percent in the developed countries and from 1 to 12 percent in developing countries. Small proportions of women aged 55 to 64 in developed countries have a university education, and proportions in most developing countries are smaller still.

LITERACY RATE OF MANY ELDERLY POPULATIONS STILL LOW

In many developed countries, literacy data no longer are collected because education, at least at the primary level, is so widespread that literacy is considered to be universal. However, this is not always the case for the elderly, particularly for older women and the oldest old. Data from some countries that still collect literacy information show that substantial proportions of the elderly may be unable to read and write. In Greece, for example, only 77 percent of people aged 65 and

older were literate in 1991, and just 67 percent of the age group 75 and over. Proportions literate among older Greek women were even lower — approximately two-thirds of women aged 65 and older and slightly over half of women aged 75 and older.

In developing countries, literacy may be uncommon among older populations. Many of today's elderly lived much of their lives prior to the rapid increase in educational attainment that occurred in the second half of the twentieth century. Consequently, many older people, and again particularly women, have low levels of literacy. While cohort changes ensure that the future education profile of the elderly will improve, it is important to remember that in many countries, a majority of today's elderly are illiterate (Hugo, 1992). This fact needs to be explicitly recognized and considered when developing programs to assist older populations.

Figure 9-3 presents estimated literacy rates for the population aged 60 and over, by sex, in five developing regions for 1980 and 1995.² In all five regions, older men are more literate than older women. In three of the five regions, less than half of older men and less than 15 percent of older women were literate in 1995. Among developing regions, Latin America and the Caribbean has the highest aggregate literacy levels for older populations; three-quarters of men and two-thirds of women aged 60 and over were literate, similar to the levels noted above in Greece.

² These estimates were produced by the Division of Statistics of UNESCO using the most recently available national data. For details about the methodology used to produce these estimates see UNESCO, 1995, Methodology Used in the 1994 Estimates and Projections of Adult Illiteracy, Statistical Issue STE-18, Division of Statistics, Paris.

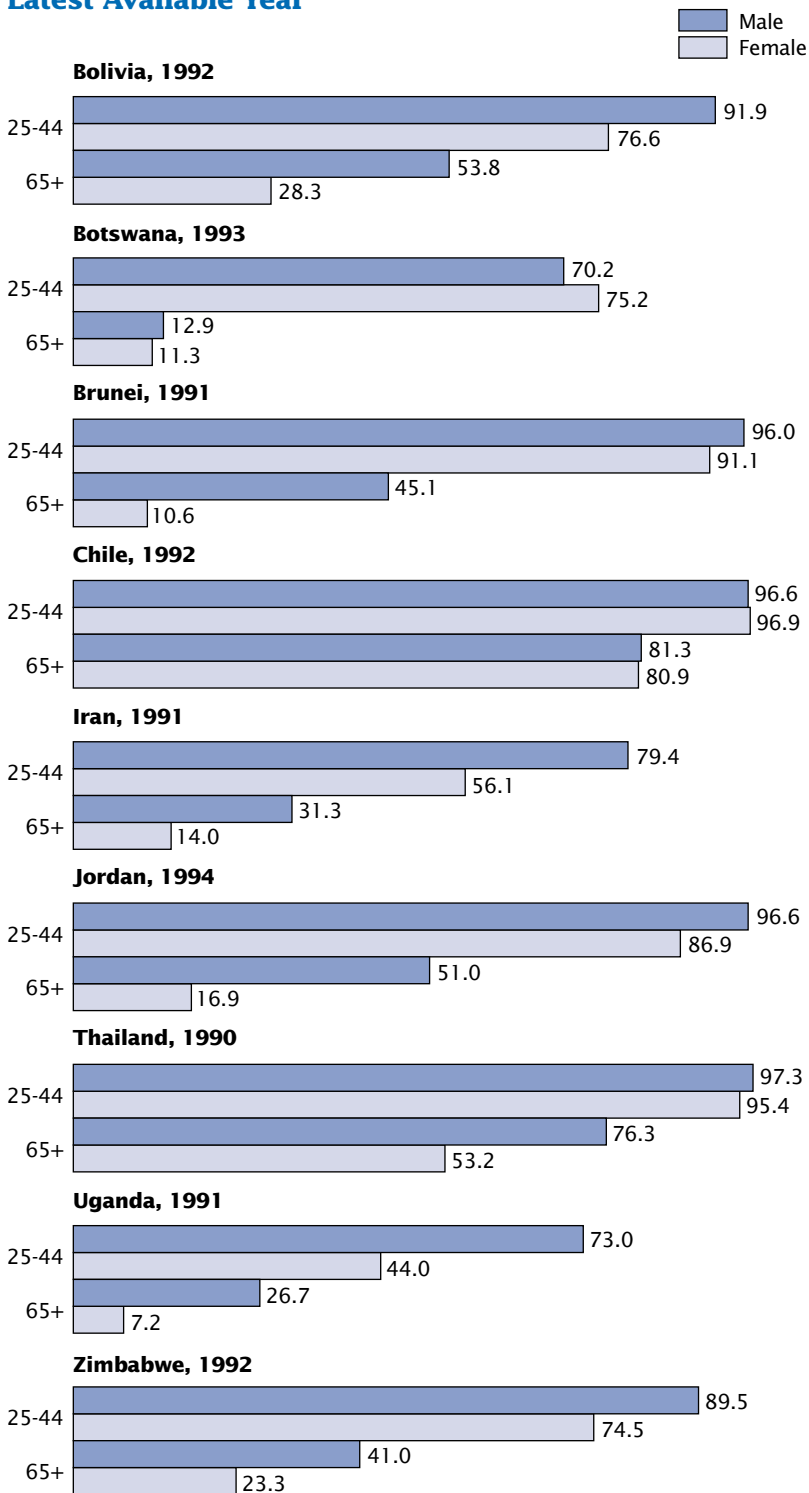
Countries vary greatly in rates of literacy among the elderly. In Chile, over 80 percent of the elderly were literate in 1992, while in Uganda less than a fifth of the elderly were literate (Figure 9-4). In most countries, older men are much more likely to be literate than older women. In Brunei, older men were four times as likely to be literate as were older women. Although very small proportions of the elderly population are literate in many developing countries, the rates rise rapidly for younger cohorts. For all the countries in Figure 9-4, with the exception of women in Uganda, well over half of the population aged 25 to 44 were literate. And among this younger age group, the difference in literacy by sex tends to dissipate.

GENDER DIFFERENTIAL IN EDUCATIONAL LEVELS AMONG THE ELDERLY IS OFTEN SUBSTANTIAL

In nearly all countries, older men have higher average levels of education than do older women. Just as overall levels of education vary widely among countries, so does the gender difference in education at older ages. The gender gap³ in educational attainment of the elderly is larger in many developed countries than in developing countries, where the level of education for the elderly is so low for both men and women that the difference between them is small. In many developed countries, where overall attainment levels are

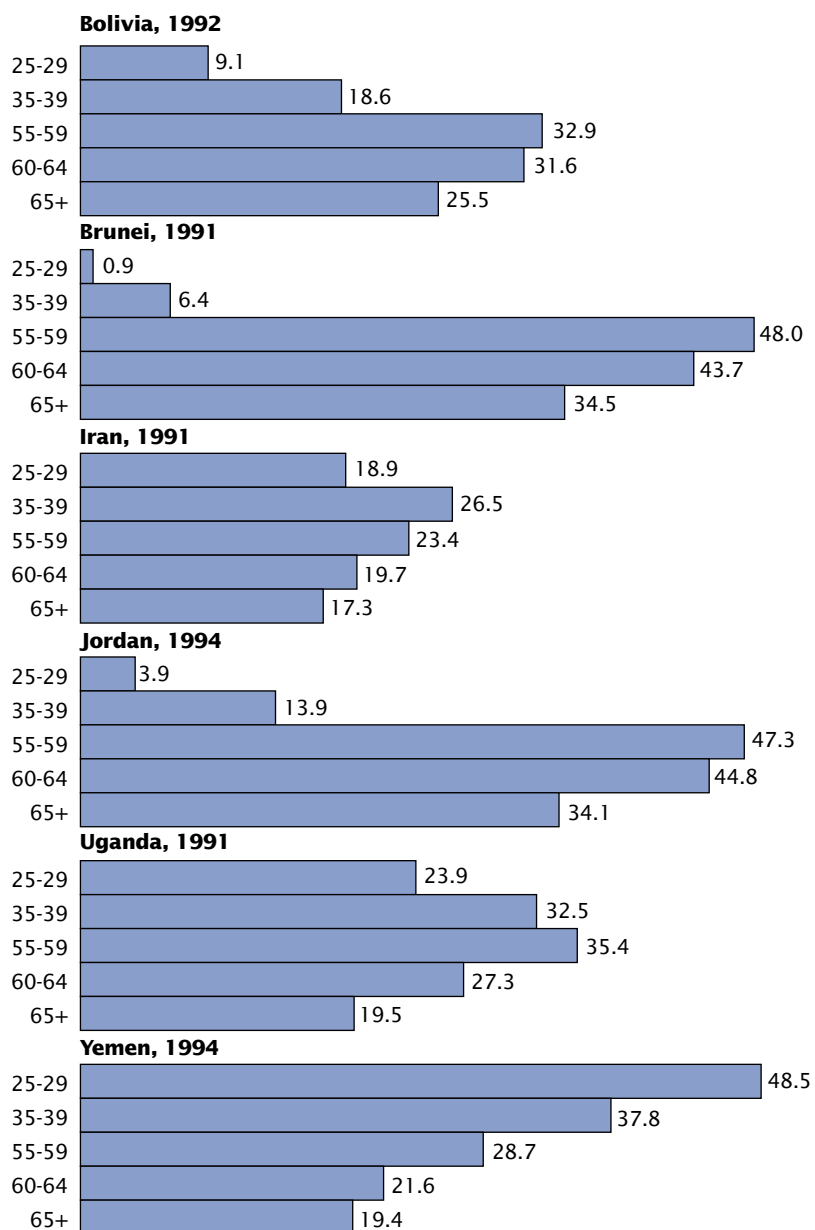
³ The gender gap is defined as the absolute difference in percentage points between the educational level of men and women. For instance, in Romania in 1992, 45.5 percent of men and 31.9 percent of women aged 65 and older had completed secondary or higher education. The gender gap for the population aged 65 and older with these levels of schooling would be the difference between the two levels (13.6 points).

Figure 9-4.
**Percent Literate in Two Age Groups:
Latest Available Year**



Sources: United Nations Educational Scientific and Cultural Organization, 1995 and country sources.

Figure 9-5.
Gender Gap in Literacy Rates for Selected Age Groups: Latest Available Year



Note: The gender gap is defined as the absolute difference in percentage points between the literacy rate for men and women.
 Source: United Nations Educational Scientific and Cultural Organization, 1995 and country sources.

higher, the difference between older men and women is larger.

As suggested by the data on literacy discussed earlier, gender differences in educational attainment are much smaller for younger than

older cohorts. In various countries, younger women complete secondary education at higher rates than do men, and in some nations the gender difference in university-level attainment at younger ages is negligible. Thus,

the disadvantages that today's older women may face because of their lower levels of education relative to men should begin to abate when these younger cohorts reach the ranks of the elderly.

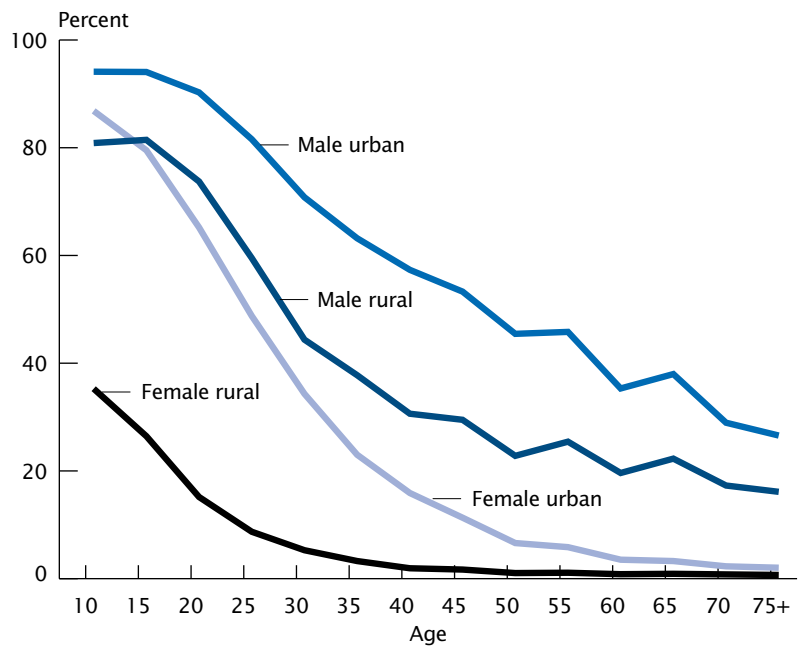
GENDER GAP IS INVERSELY RELATED TO AGE AT OLDER AGES

Examining the gender gap by age in developing countries reveals the differential rate of improvement in educational attainment. Figure 9-5 presents the gender gap in literacy rates for five age groups in several countries with data from the 1990s. A somewhat counter-intuitive picture emerges for the three older age groups, namely, that the gender gap decreases as age increases. In other words, there is a larger absolute difference between male and female literacy rates at ages 55 to 59 than among people aged 65 and over. The increase in the gender gap for younger-old age groups reflects historical patterns of educational promotion. When countries with low overall levels of education and limited resources began to improve the educational attainment of their populations, the initial focus was more on educating males than females. In most developing countries, people aged 55 and over were of school age when formal education was not widespread. Although educational attainment was improving, it was improving more for men than for women. Thus, for these older age groups, the gender gap is less among the elderly than among people aged 55 to 64. For some countries in Figure 9-5, the gender gap at ages 25 to 29 and 35 to 39 is smaller than at the older ages, indicating a more equal inclusion of both sexes in educational programs in recent years.

EDUCATIONAL DISADVANTAGE IS COMMON IN RURAL AREAS

The quality and quantity of rural educational facilities in most nations tend to be inferior to those in urban areas. Consequently, literacy levels and educational attainment are lower in rural areas, particularly in developing countries. Data for Yemen (Figure 9-6) illustrate the common pattern wherein the rural disadvantage in literacy is evident for both sexes (i.e., rural males have lower rates than urban males and rural females have lower rates than urban females). It appears that differences by gender are greater than differences by urban/rural residence. Urban women have lower literacy rates than rural men, except at the very youngest ages. The sexes also differ in size of the rural/urban gap by age. Rural males consistently have lower literacy rates than urban

Figure 9-6.
Percent Literate by Age, Sex, and Urban and Rural Residence, Yemen: 1994



Source: Population and Housing Census of Yemen, 1994.

Table 9-1.
Earnings Ratios of Selected Age Groups in 15 Countries by Level of Educational Attainment: 1995

Country	45-54 years/25-29 years				55-64 years/ 45-54 years
	Less than upper secondary	Upper secondary	Nonuniversity tertiary	University	Overall
Australia	1.30	1.26	1.35	2.06	0.85
Canada	1.05	1.46	1.37	1.96	0.86
Denmark	1.21	1.23	1.29	1.60	0.92
Finland	1.43	1.36	1.69	2.11	0.90
France	1.18	1.47	1.45	1.95	1.07
Germany	0.97	1.28	1.10	1.76	0.97
Ireland	1.24	1.59	1.59	2.25	(NA)
Japan	1.23	1.44	1.64	1.99	0.86
Mexico	1.13	1.61	1.33	1.65	0.84
New Zealand	1.25	1.39	1.16	1.93	0.95
Norway	1.10	1.26	1.88	1.67	(NA)
Sweden	1.38	1.26	1.67	1.70	0.90
Switzerland	1.06	1.25	1.52	1.80	0.97
United Kingdom	0.93	1.09	1.41	1.50	0.81
United States	1.29	1.28	1.39	1.67	0.89

NA Not available.

Note: Ratios reflect gross annual earnings before taxes. Data for Finland and Ireland refer to 1994 and 1993 respectively.

Source: Organization for Economic Co-Operation and Development (Employment Outlook 1998).

males in Yemen, and the gap between the two areas is fairly even across the age spectrum. For women, on the other hand, the gap between rural and urban literacy levels is much wider at the younger than the older ages, suggesting that in recent years urban women have been afforded greater relative access to education than have their rural counterparts.

EDUCATION AFFECTS OTHER DIMENSIONS OF LIFE

As mentioned earlier, education is related to health behavior and income accumulation throughout the life course. Studies in the United States have shown that

reading skills generally worsen with age; a recent study also demonstrated that functional health literacy is markedly lower at older ages, even after controlling for variables such as cognitive dysfunction, physical functioning and visual acuity (Baker et al., 2000). This study raises questions about the effects of life-long education, the efficacy of tests that measure cognitive ability, and other age-related changes that may affect testing procedures.

Table 9-1 shows ratios of average earnings for workers in three age groups. The earnings ratio of persons in the so-called peak earning years (45 to 54) to those of recent

labor force entrants (25 to 29 years) generally rises with educational attainment level, but the right-hand column of Table 9-1 indicates an overall decline in earnings of people 55 to 64 relative to people 45 to 54. Because educational attainment may be very different by age cohort, this table may confound pure age effects with returns to education. Further analysis of available data suggests that, when averaged over all countries, the earnings premium of peak-earning workers relative to recent entrants rises considerably with higher educational attainment (OECD, 1998 Employment Outlook).

CHAPTER 10.

Labor Force Participation and Retirement

Rapid growth of elderly populations may put pressure on a nation's financial resources. This concern is based, at least partially, on the assumption that the elderly do not contribute to the economy. However, many older people do work, and examining the labor force participation and characteristics of older workers gives a clearer picture of their contribution. Information on older workers also is useful in planning economic development and the financing of retirement.

Some characteristics of older workers seem not to vary among countries. In all countries, the elderly account for a small proportion of the overall labor force. Their share of the total labor force in the study countries ranges from less than 1 percent to 7 percent. A second commonality is that labor force participation declines as people near retirement age. A third is that participation rates are higher for older men than for older women.

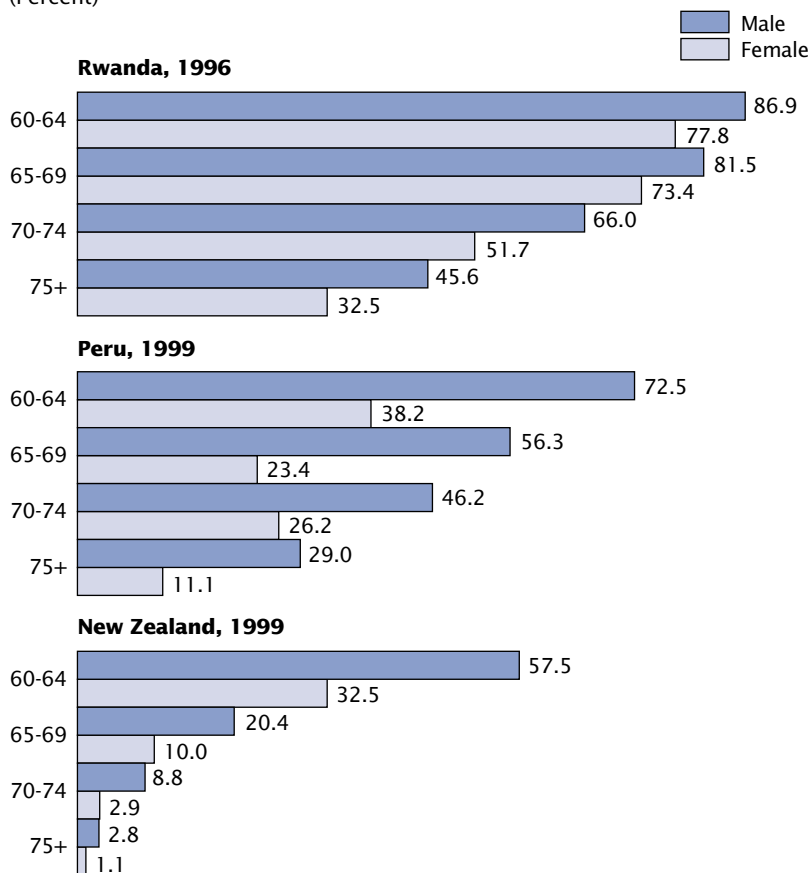
Other characteristics of older workers show interesting differences across countries. The rate of participation of older workers varies substantially, and generally is lower in developed than in developing countries. Only 2 percent of men aged 65 and over participate in the labor force in some developed countries, whereas in certain developing countries well over half of elderly men are economically active. The occupational concentration of older workers also varies widely among countries.

Figure 10-1 presents data on formal economic activity for older women and men in three countries, chosen to represent different levels of economic development. Some of the patterns mentioned above are apparent in these data; older women have lower participation rates than older men, and participation rates for both sexes decrease

with age. On the other hand, the work status of older workers differs dramatically among the countries. In Rwanda, more than three-quarters of all women aged 60 to 64 are economically active, and even at ages 70 and older, a substantial number remain active in the labor force. In contrast, although a nontrivial proportion of women

Figure 10-1.
Economically Active Older Population by Age for Rwanda, Peru, and New Zealand: Late 1990s

(Percent)



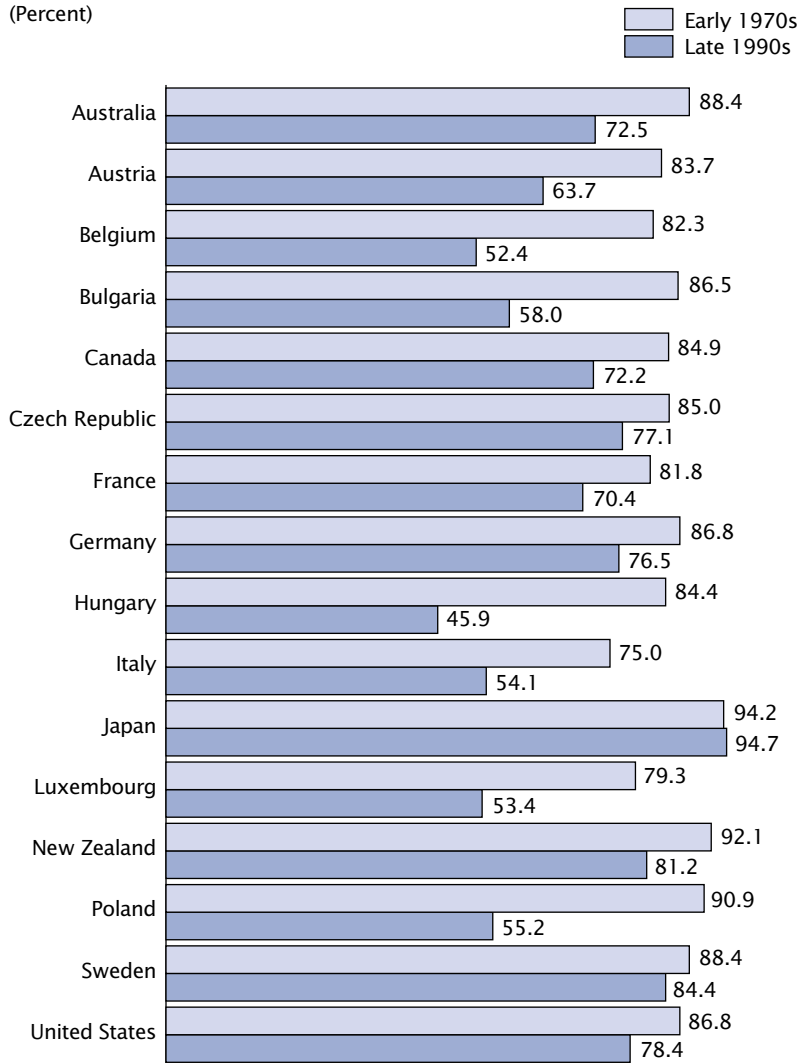
Source: International Labour Office (various issues of the Yearbook of Labour Statistics).

aged 60 to 64 are economically active in New Zealand, participation rates decrease dramatically with age so that for women aged 70 to 74, less than 3 percent are still active. Cross-national differences in levels of labor force activity are associated with societal wealth; countries with high GNP (gross national product) tend to have much lower labor force participation rates of the elderly and near elderly than do low-income countries (Clark, York, and Anker, 1997). In richer countries, the elderly or near elderly can afford to retire because of pension schemes or social security systems. These programs are often lacking in poorer countries.

Figure 10-2a.

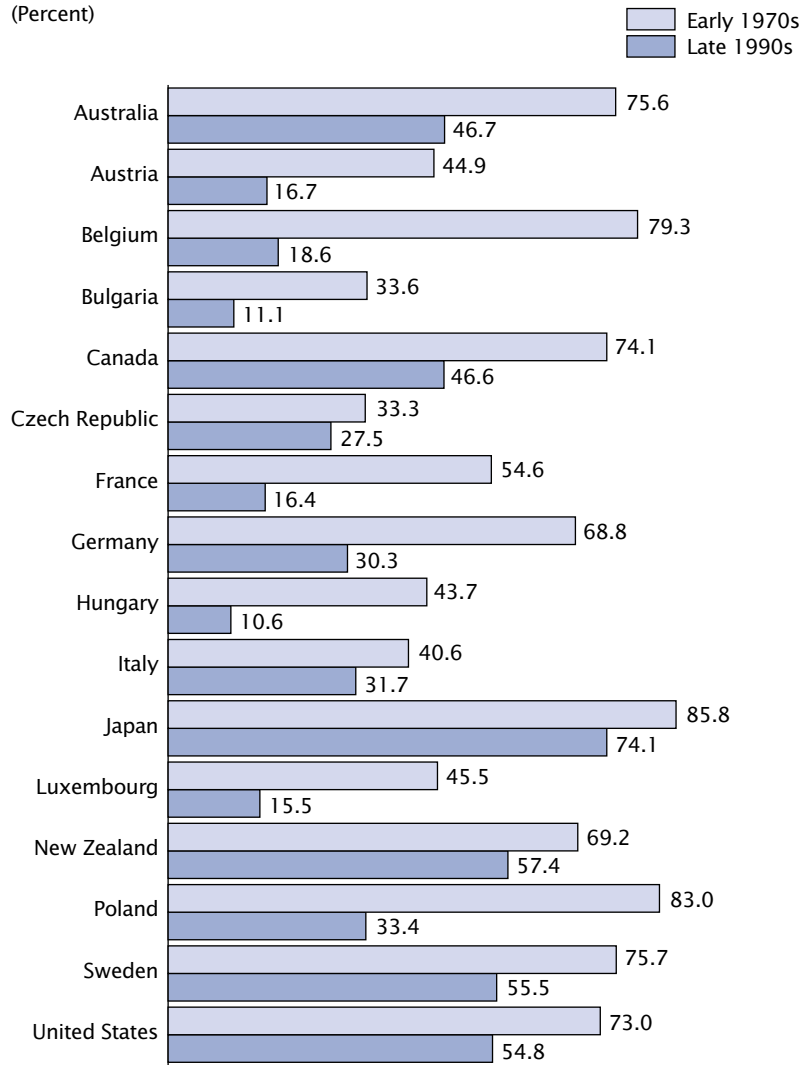
Labor Force Participation Rates for Men Aged 55 to 59 in Developed Countries

(Percent)



Sources: U.S. Census Bureau, 2000a and International Labour Office (various issues of the Yearbook of Labour Statistics).

Figure 10-2b.
Labor Force Participation Rates for Men Aged 60 to 64 in Developed Countries
 (Percent)



Sources: U.S. Census Bureau, 2000a and International Labour Office (various issues of the Yearbook of Labour Statistics).

TIME TREND IN LABOR FORCE PARTICIPATION DIFFERS BY GENDER

The trend in most developed countries has been for labor force participation rates for older men to decline in recent decades. Figure 10-2 shows male labor force participation rates for three older age groups in 16 developed countries; in all of these countries, participation rates declined between the early 1970s and the late 1990s. These declines are particularly pronounced for men aged 60 to 64. In ten of the sixteen countries in the early 1970s, well over half of men aged 60 to 64 were still active.

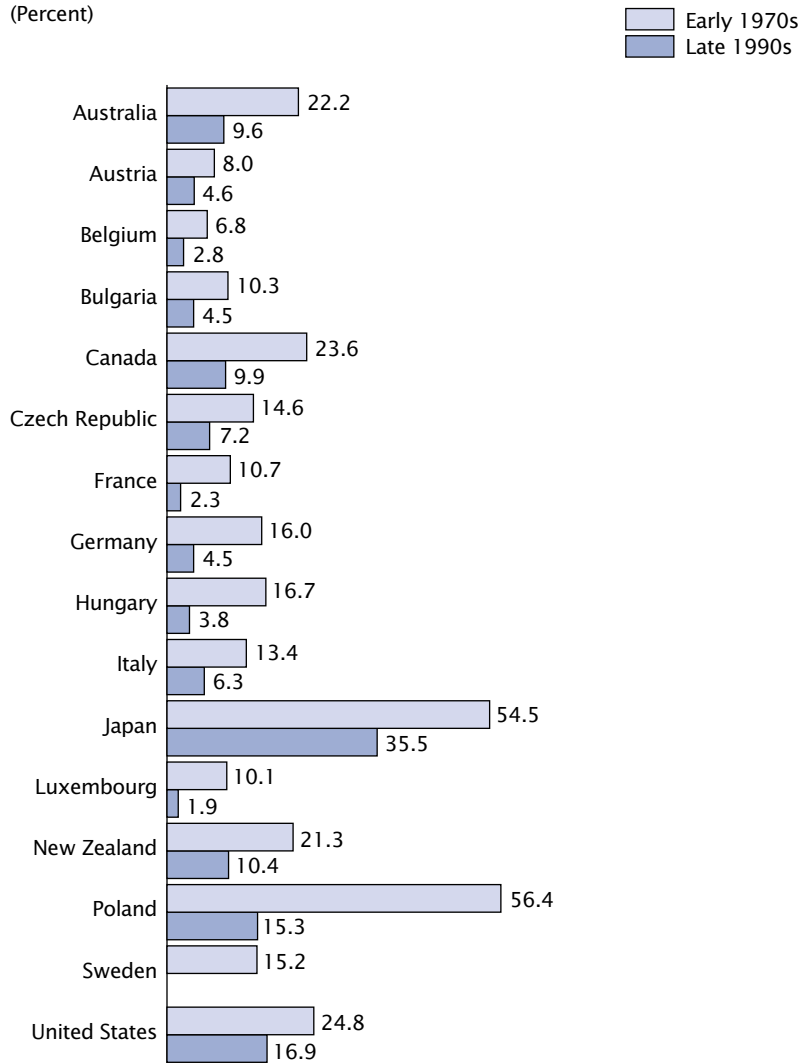
In the remaining six countries activity rates ranged from 33 percent to 46 percent. By the late 1990s, only Japan, New Zealand, Sweden, and the United States had male participation rates over 50 percent. Rates also have fallen for the 65-and-over age group.¹ In the early 1970s, only two countries in Figure 10-2 had participation rates lower than 10 percent for elderly men; by the late 1990s, most of the countries had rates less than 10 percent. But as discussed later in this chapter, the trend in declining participation rates for older men has stopped or even reversed in a number of developed countries.

¹ In the United States, much of the decline in labor force participation rates for elderly men occurred earlier in the twentieth century. According to Costa (1998), 70 percent of the decline in participation rates between 1880 and 1990 for men aged 65 and older occurred before 1960.

Figure 10-2c.

Labor Force Participation Rates for Men Aged 65+ in Developed Countries

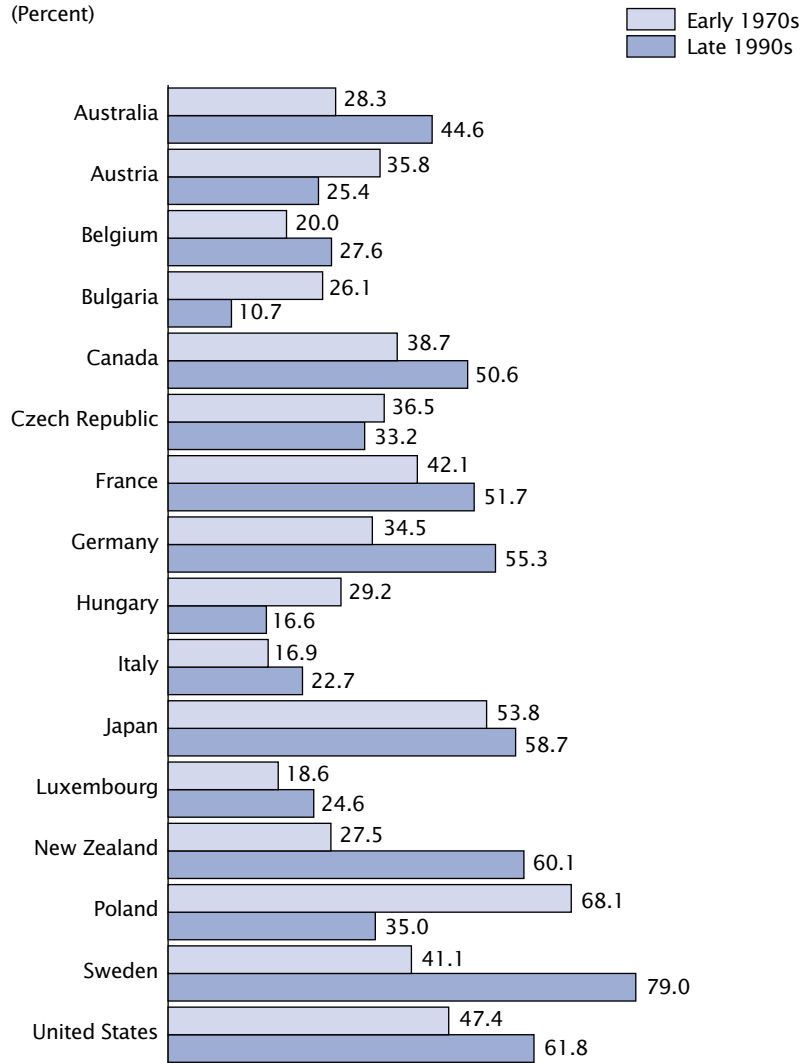
(Percent)



Note: Later data for Belgium 65+ refer to ages 65-69 and for Hungary to ages 65-74; data for Sweden 65+ are not reported by the ILO.
Sources: U.S. Census Bureau, 2000a and International Labour Office (various issues of the Yearbook of Labour Statistics).

Figure 10-3a.
**Labor Force Participation Rates for Women
 Aged 55 to 59 in Developed Countries**

(Percent)



Sources: U.S. Census Bureau, 2000a and International Labour Office (various issues of the Yearbook of Labour Statistics).

The trend for older women in these developed countries differs from the male pattern. In many countries, female participation rates have increased for almost all adult age groups up to age 60, whereas rates for elderly women have declined (Figure 10-3). In some cases, the increase among women aged 55 to 59 has been quite marked. In New Zealand, for example, 60 percent of women aged 55 to 59 were economically active in 1998, up from 28 percent in 1971.

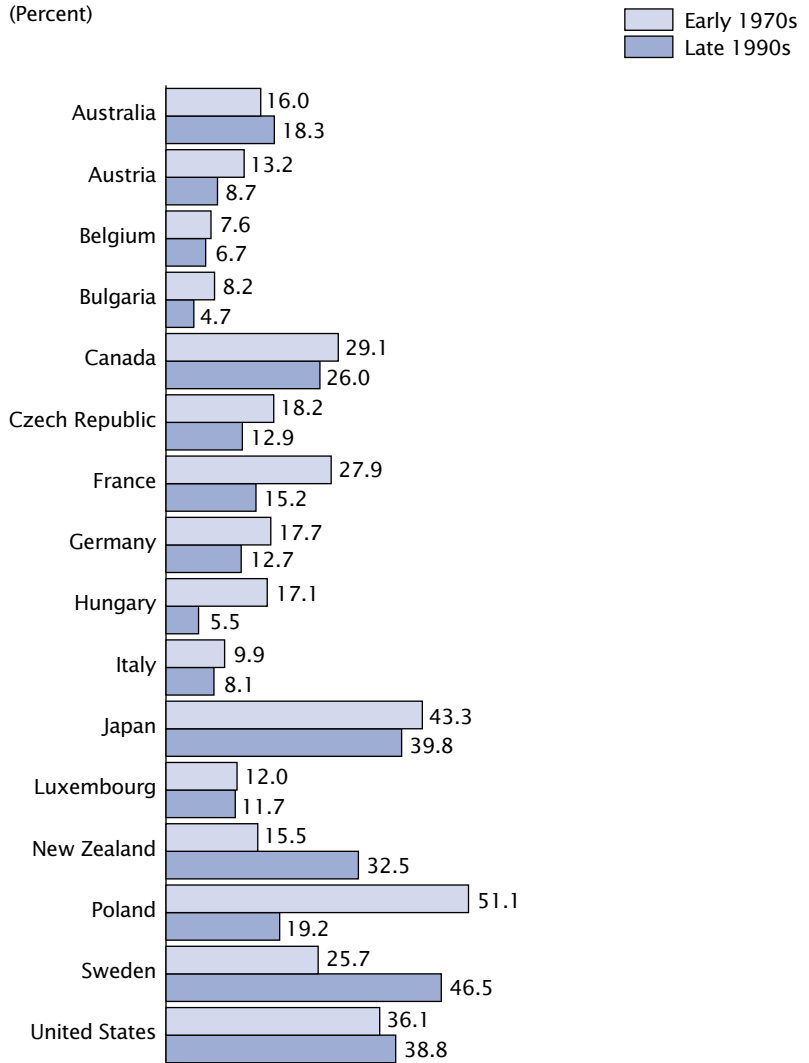
While female participation was increasing at younger ages, nearly all developed countries experienced a decrease in elderly female labor force participation between the early 1970s and the late 1990s. Very small proportions of elderly women currently are economically active in developed nations; among the 22 developed countries in Appendix A, Table 10, only Japan, Poland, and the United States have elderly female participation rates above 4 percent.²

² Rates for Norway and Ukraine in Appendix Table 10 are about 9 percent, but these refer to only a portion of their elderly female populations, i.e., women aged 65 to 74.

Figure 10-3b.

Labor Force Participation Rates for Women Aged 60 to 64 in Developed Countries

(Percent)

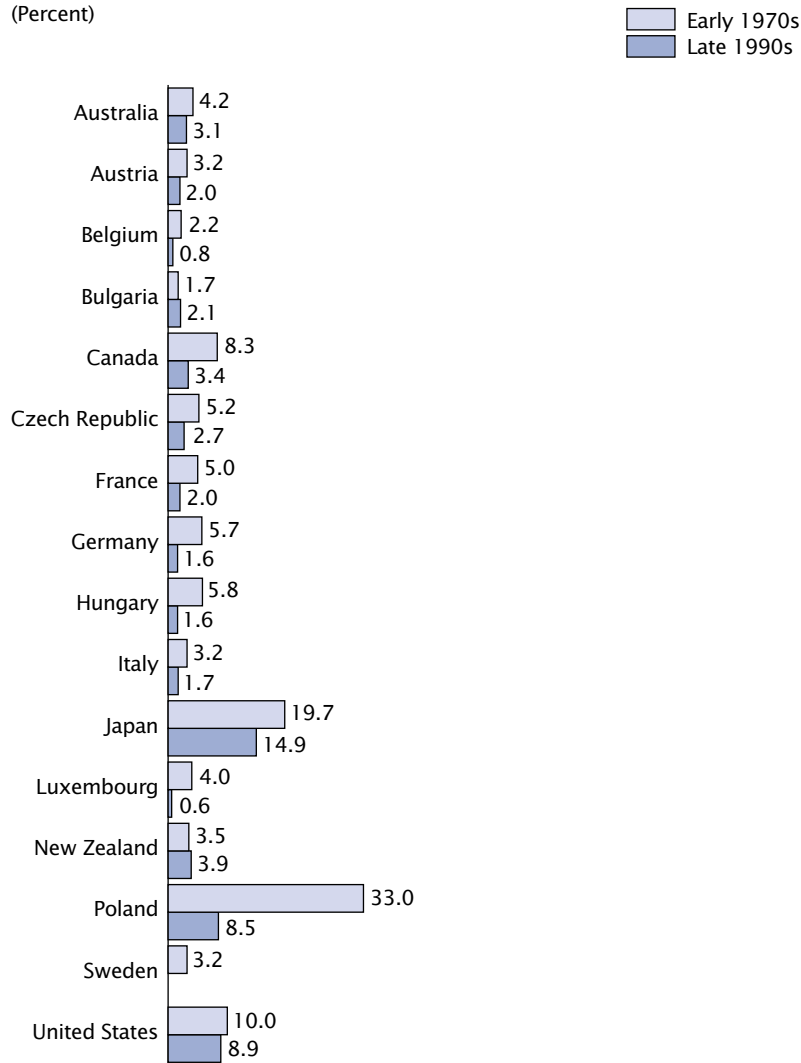


Sources: U.S. Census Bureau, 2000a and International Labour Office (various issues of the Yearbook of Labour Statistics).

Figure 10-3c.

Labor Force Participation Rates for Women Aged 65+ in Developed Countries

(Percent)



Note: Later data for Belgium 65+ refer to ages 65-69 and for Hungary to ages 65-74; data for Sweden 65+ are not reported by the ILO.
Sources: U.S. Census Bureau, 2000a and International Labour Office (various issues of the Yearbook of Labour Statistics).

WHY THE BIG DECREASE FOR OLDER MEN?

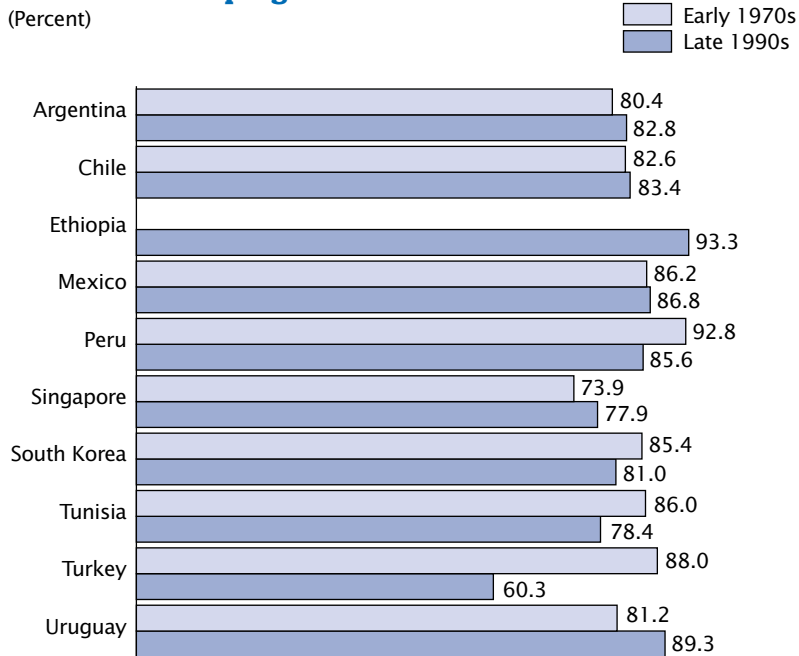
Several reasons may account for the sharp decline in activity rates of older men in developed countries. An increase in societal wealth is most likely the main reason for the drop in participation rates. A secondary reason may be that new technologies have changed the industrial and occupational organization of many economies, and generated the need for a recently trained labor force. New technologies can make the skills of older workers obsolete and these workers may choose to retire rather than learn new skills (Ahituv and Zeira, 2000; Bartel and Sicherman, 1993). In countries with persistently high levels of unemployment, there may be formal and informal pressures on older workers to leave the labor force to make room for younger workers. Perhaps most importantly, the growth and proliferation of financial incentives for early retirement have enabled many older workers to afford to stop working. In much of Eastern Europe and the former Soviet Union, older workers are choosing early retirement over unemployment as new market mechanisms prompt firms to fire redundant workers (Commander and Yemtsov, 1997).

ELDERLY IN DEVELOPING COUNTRIES HAVE HIGH PARTICIPATION RATES

The proportion of economically active elderly men is high in developing countries compared with more-industrialized nations. Not surprisingly, many elderly people in predominantly rural agrarian societies work of necessity, while “retirement” may be a luxury reserved for urban elites. In nations as diverse as Bangladesh, Indonesia, Jamaica, Mexico, Pakistan, and Zimbabwe, more than 50 percent of all elderly men are considered to be economically active. Economic activity rates of older and elderly women also are higher in developing than in developed countries. Some national data may understate the true 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 “economic.” Many of the activities that older women are involved in, such as subsistence agriculture or household industries, often are not well documented by conventional data collection methods (Hedman, Perucci, and Sundström, 1996).

Figure 10-4a.

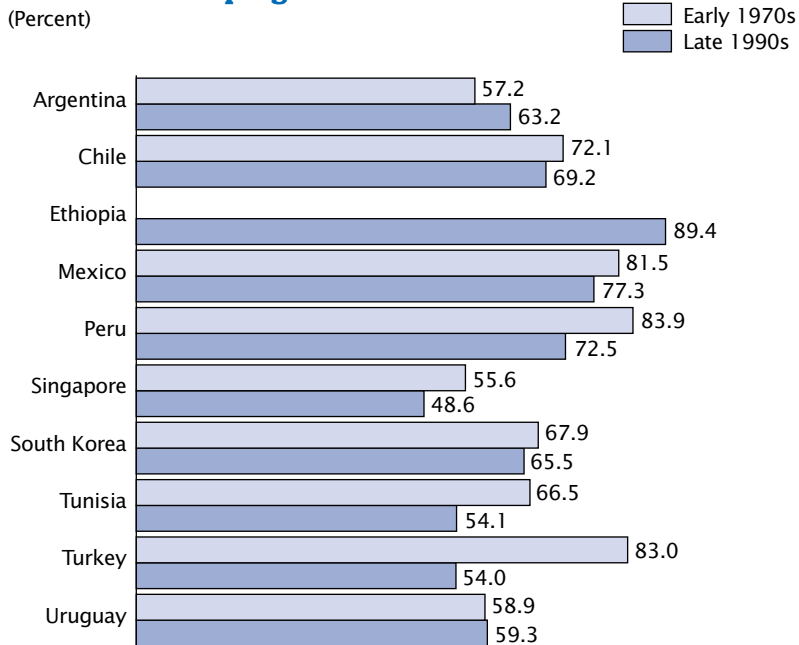
Labor Force Participation Rates for Men Aged 55 to 59 in Developing Countries



Note: Data for Ethiopia in the early 1970s are not available.
Sources: U.S. Census Bureau, 2000a and International Labour Office (various issues of the Yearbook of Labour Statistics).

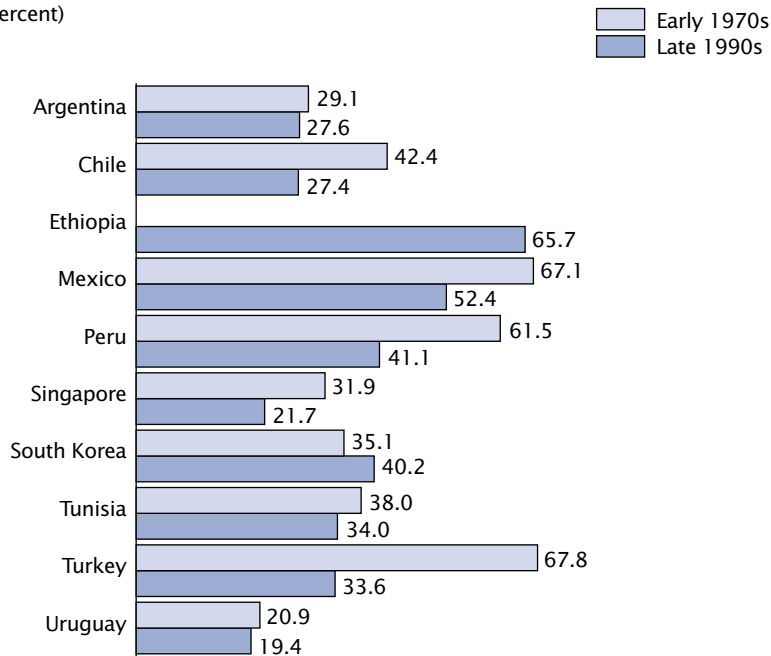
Figure 10-4b.

Labor Force Participation Rates for Men Aged 60 to 64 in Developing Countries



Note: Data for Ethiopia in the early 1970s are not available.
Sources: U.S. Census Bureau, 2000a and International Labour Office (various issues of the Yearbook of Labour Statistics).

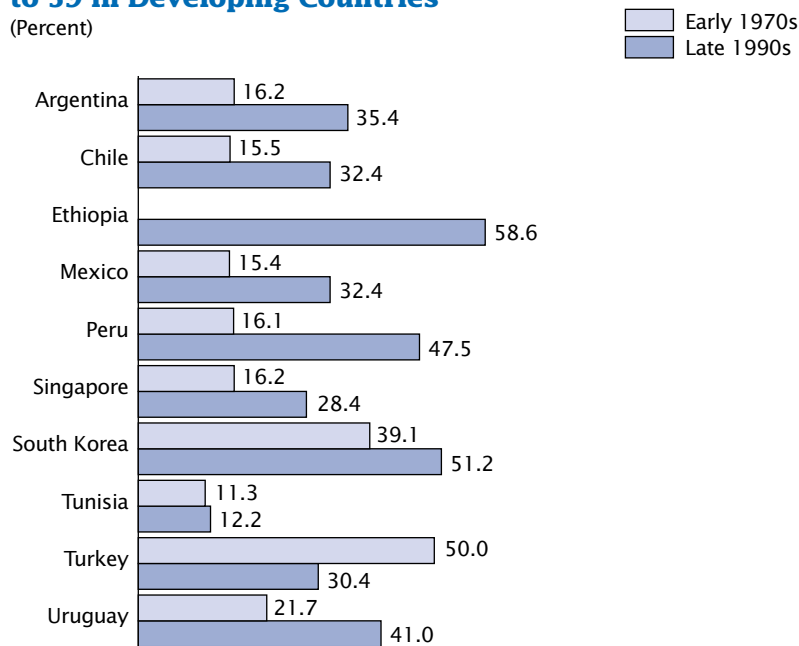
Figure 10-4c.
Labor Force Participation Rates for Men Aged 65+ in Developing Countries
 (Percent)



Note: Data for Ethiopia in the early 1970s are not available.
 Sources: U.S. Census Bureau, 2000a and International Labour Office (various issues of the Yearbook of Labour Statistics).

Data on economic activity rates over time for developing countries do not show as clear a trend for older workers as seen in developed countries. Although many developing countries have experienced a decrease in economic activity of older male workers, in most such countries the decrease is much smaller than in developed countries (Figure 10-4). Akin to the pattern in developed countries, many developing countries have witnessed an increase in labor force participation rates for women aged 55 to 64 (Figure 10-5). Unlike the pattern in developed nations, several developing countries also have experienced increases in participation for women aged 65 and older. Because of the problems with statistics on female economic activity mentioned above, these changes could reflect “real” increases in activity rates as well as improvements in data collection.

Figure 10-5a.
Labor Force Participation Rates for Women Aged 55 to 59 in Developing Countries
 (Percent)



Note: Data for Ethiopia in the early 1970s are not available.
 Sources: U.S. Census Bureau, 2000a and International Labour Office (various issues of the Yearbook of Labour Statistics).

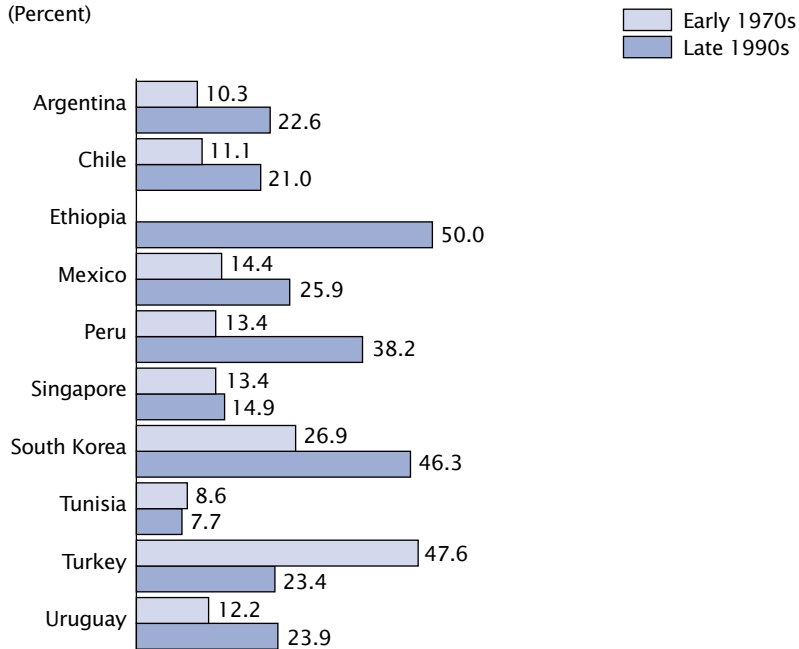
AGRICULTURE STILL IMPORTANT SOURCE OF EMPLOYMENT FOR ELDERLY

Just as labor force participation rates of older workers vary among countries, so do levels of concentration in various occupations. Economies in developed countries have shifted from agriculture and heavy industries toward services and light industries, which is a shift from physically demanding and sometimes hazardous jobs to work which requires less brawn and different technical skills. This shift may benefit older workers insofar as jobs requiring mental ability rather than physical strength may enable them to remain active longer. Conversely, the shift could be detrimental to older workers if the new jobs require skills or training which older workers may not have or easily acquire.

Figure 10-5b.

Labor Force Participation Rates for Women Aged 60 to 64 in Developing Countries

(Percent)



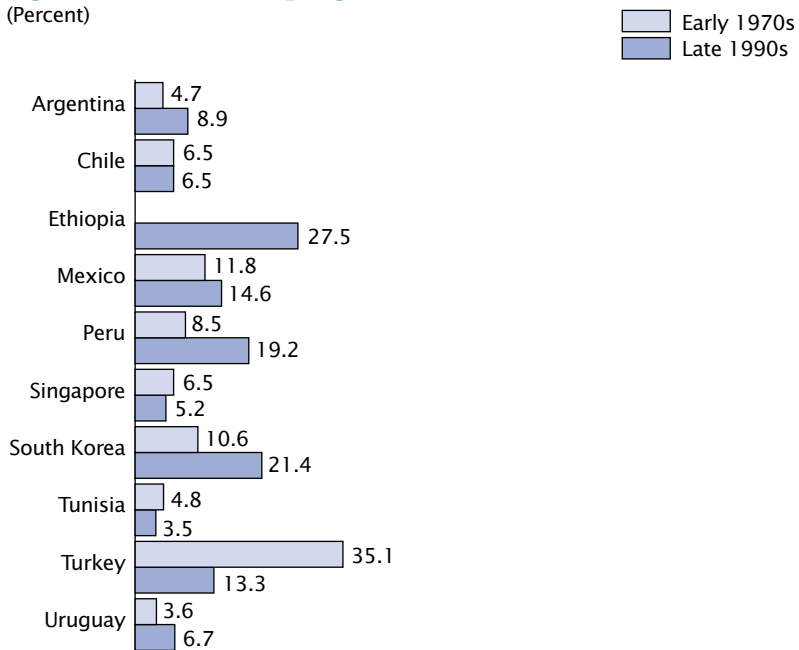
Note: Data for Ethiopia in the early 1970s are not available.

Sources: U.S. Census Bureau, 2000a and International Labour Office (various issues of the Yearbook of Labour Statistics).

Figure 10-5c.

Labor Force Participation Rates for Women Aged 65+ in Developing Countries

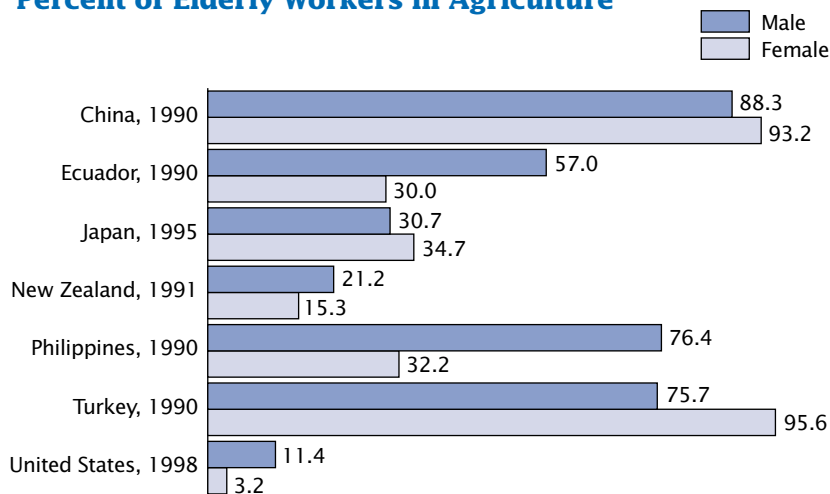
(Percent)



Note: Data for Ethiopia in the early 1970s are not available.

Sources: U.S. Census Bureau, 2000a and International Labour Office (various issues of the Yearbook of Labour Statistics).

Figure 10-6.

Percent of Elderly Workers in Agriculture

Note: Data for New Zealand refer to ages 60 and over.
Source: National sources.

Not surprisingly, agriculture is by far the most common occupation for older and elderly workers in most developing countries (Figure 10-6). And despite the worldwide trend away from employment in agriculture, this sector was still an important source of employment in many developed countries during the 1970s and 1980s. Even in the 1990s, a nontrivial proportion of economically active elderly in some developed countries worked in the agricultural sector. In 1995 in Japan, 31 percent of elderly men and 35 percent of elderly women were involved in agriculture. Aggregate data from the early 1990s for 12 European Union nations showed that agriculture

Table 10-1.

Older Workers (55 and Over) per 100 Younger Workers (Under 55) in Selected Job Sectors: 1998

	Goods-producing sector			Service sector		
	Total	Agriculture, hunting and forestry	Manufacturing	Total	Personal services	Social services
OECD average	15	39	10	12	11	12
Austria	10	28	6	7	7	7
Belgium	7	21	5	7	8	7
Canada	12	27	10	10	9	10
Czech Republic	10	12	9	10	9	13
Denmark	14	34	11	12	15	13
Finland	12	24	9	9	8	10
France	8	20	6	8	10	8
Germany	15	30	14	15	16	16
Greece	31	68	11	11	12	9
Ireland	15	45	7	10	10	13
Italy	12	33	8	13	12	13
Korea	30	131	8	13	(NA)	(NA)
Luxembourg	6	19	6	7	5	10
Mexico	16	28	8	11	13	7
Netherlands	9	21	8	7	6	8
New Zealand	12	26	7	7	-	8
Norway	18	36	16	15	9	18
Portugal	26	112	10	15	18	12
Spain	15	36	11	12	14	13
Sweden	20	50	17	19	15	21
Switzerland	20	39	18	17	20	18
United Kingdom	15	32	14	13	14	14
United States	14	25	13	15	11	16

- Represents zero. NA Not available.

Source: Excerpted from Organization for Economic Co-Operation and Development (Employment Outlook 2000).

continued to employ a disproportionate share of older relative to younger workers (Eurostat, 1993a). More than 20 percent of economically active men and women aged 60 and older in these countries worked in agriculture compared with about 5 percent of people aged 14 to 59. More recent information for 23 OECD countries shows that the ratio of older (55+) to nonolder (54 and under) workers is generally much higher in agriculture, hunting, and forestry than in any other goods-producing or service sector (Table 10-1).

NEARLY TWO-THIRDS OF ELDERLY FEMALE U.S. WORKERS IN SERVICE AND SALES

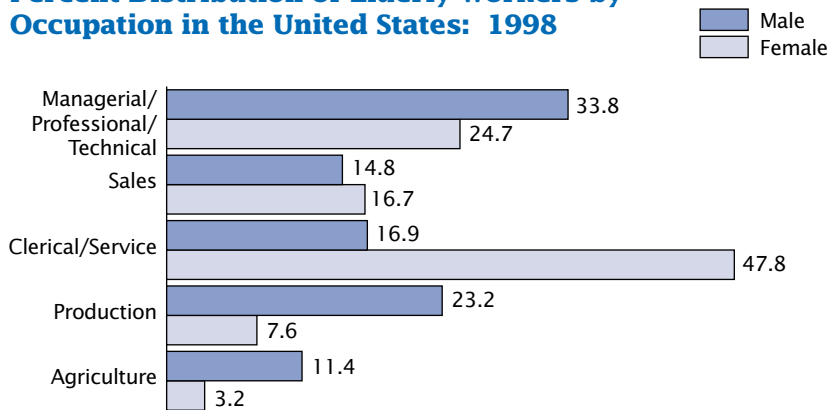
Figure 10-7, which presents the occupational distribution of elderly male and female workers in the United States, shows distinct differences by gender. In 1998, almost half of elderly working women were employed in clerical or service jobs compared with only 17 percent of elderly men. A majority of working elderly men held either managerial/professional/technical positions (34 percent) or production jobs (23 percent). Corresponding figures for elderly women were 25 percent and 8 percent. Unlike the situation in some developed countries, only 11 and 3 percent of active elderly U.S. men and women, respectively, worked in agriculture.

BRIDGES TO RETIREMENT

Just as the propensity to work at older ages varies considerably from country to country, so too do patterns of retirement and the concept

Figure 10-7.

Percent Distribution of Elderly Workers by Occupation in the United States: 1998



Source: Bureau of Labor Statistics, unpublished tabulations from the Current Population Survey, average annual data, 1998.

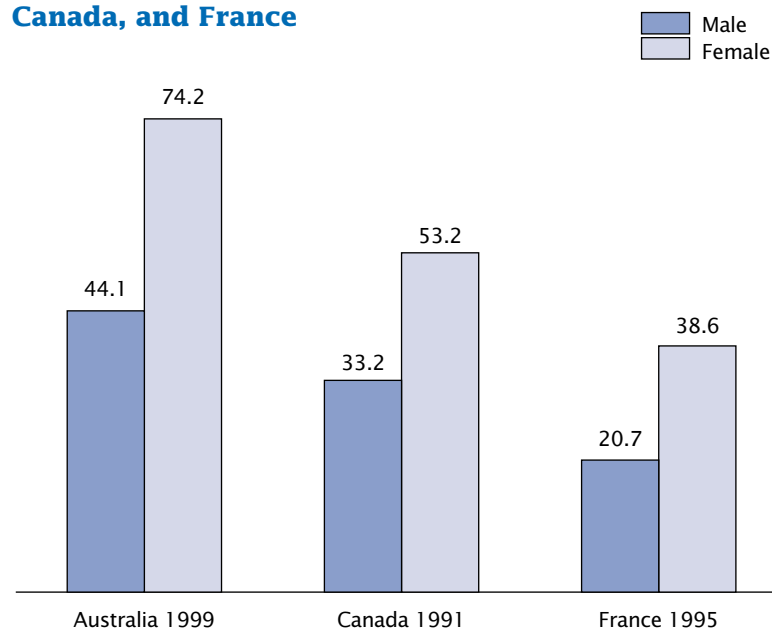
of retirement itself. During periods of economic contraction in highly industrialized nations, governments may actively encourage older workers to cease active employment at relatively young ages. On the other hand, when the labor market is tight, governments may look for methods to entice older workers to remain in the labor force or re-enter 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 (Tracy, 1979). 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 a disability.

OLDER WOMEN MORE LIKELY THAN OLDER MEN TO WORK PART TIME

Some older workers use part-time work as a gradual transition to retirement (Walker, 1999). Part-time work is an option that may appeal to older workers by enabling them to remain active in the labor force while also pursuing leisure activities (Quinn and Kozy, 1996). Data for working men aged 60-64 in nine developed countries show large differences in the prevalence of part-time employment, ranging from less than 8 percent in Italy and Germany to more than 35 percent in Sweden and the Netherlands (OECD, 2000). Available data from developed countries suggest that older working women are much more likely than older men to be involved in part-time work (Figure 10-8). In Australia, three-fourths of elderly women who were economically active in 1999 worked part time, compared to fewer than half of economically active elderly men.

Figure 10-8.
**Percent of Economically Active Elderly Population
 Working Part Time in Australia,
 Canada, and France**



Note: Data for France refer to ages 60 and over.
 Source: National sources.

In the 15 European Union countries as a whole, 41 percent of working women aged 55-64 were in part-time positions in 1998, compared with just 8 percent of working men in that age group (Eurostat, 2000).

The rate of part-time work for people nearing retirement generally was increasing with time in the late 1980s/early 1990s (Eurostat, 1993b). Even though percentages of older workers who work part time may be substantial, a recent OECD (2000) analysis notes that these percentages often represent only a small fraction of the total older population, since many people have retired by age 60. Looking at older male cohorts as they aged in the 1990s, the study concludes that

gradual retirement is still relatively uncommon in industrialized nations. The strongest tendency toward part-time work was seen in Japan, Sweden, and the United States.

UNEMPLOYMENT LOW AMONG THE ELDERLY

The elderly typically have low levels of unemployment compared to younger workers. In developed countries, unemployment rates for the elderly frequently are less than 5 percent (OECD Labour Force Statistics, 2000). However, people aged 55 to 64 often have unemployment rates higher than or similar to rates for people aged 25 to 54 (Figure 10-9). Establishing a time trend in unemployment rates for older people is hindered by

data availability, the effects of the business cycle, and differences in definitions across countries.³ In countries with available data, unemployment rates for all age groups commonly were higher in 1999 than in 1980. Gender differences in unemployment rates at older ages are not consistent; in some countries, men have higher rates and in others the reverse is true. When unemployment rates for ages 55 to 64 are disaggregated, rates for the age group 55 to 59 tend to be somewhat higher than for the age group 60 to 64, perhaps because people in the older age group may opt to retire if possible rather than be unemployed.

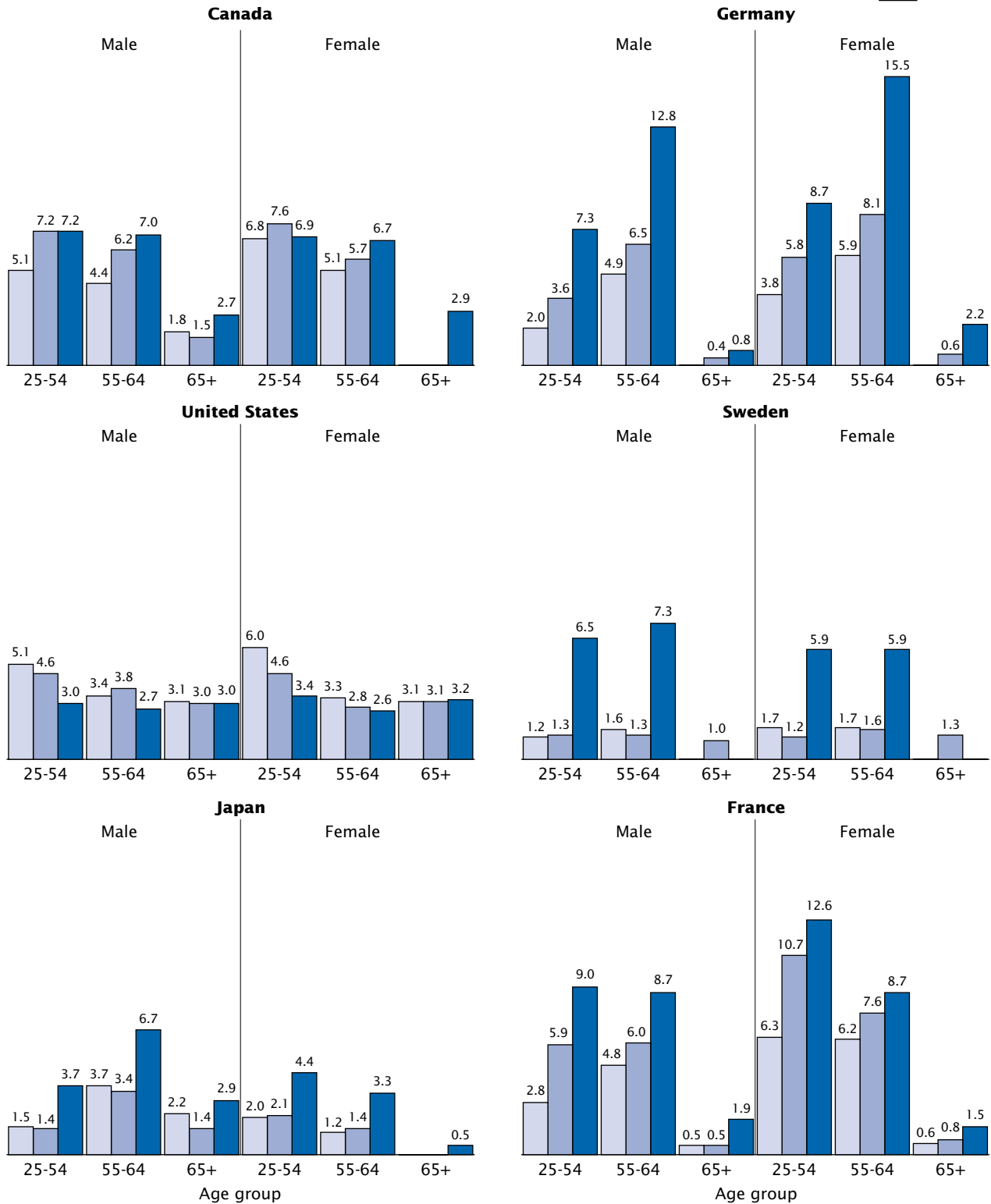
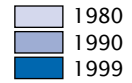
Although the unemployment rate may be lower for older than for younger workers, older people who are unemployed tend to remain unemployed longer than their younger counterparts. In several OECD countries, well over half of unemployed people aged 55 and over had been unemployed continuously for more than 1 year. In most OECD countries, the proportion of long-term unemployed people aged 55 and older is much higher than among younger age groups. A similar pattern is seen in some Eastern European nations. In Bulgaria in 1995, 74 percent of unemployed men aged 50 to 59 and 78 percent of unemployed women aged 50 to 54 had been without work for more than 1 year (European Commission, 1995).

³ And, in many developing countries, the lack of programs to provide monetary support during unemployment means that most people cannot "afford" to be unemployed.

Figure 10-9.

Unemployment for Three Age Groups: 1980, 1990, and 1999

(Percent)



Notes: Unemployment rates for people aged 65+ in Canada, Germany, Japan, and Sweden were reported to be zero in certain years. Latest data for Canada refer to 1998. 1980 data for Germany refer to West Germany. Source: Organization for Economic Co-Operation and Development, 2000 (Labor Force Statistics 1979-1999).

DISCOURAGEMENT REDUCES NUMBER OF OLDER WORKERS

The definition of discouraged worker differs somewhat 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 economically active population. In some countries,

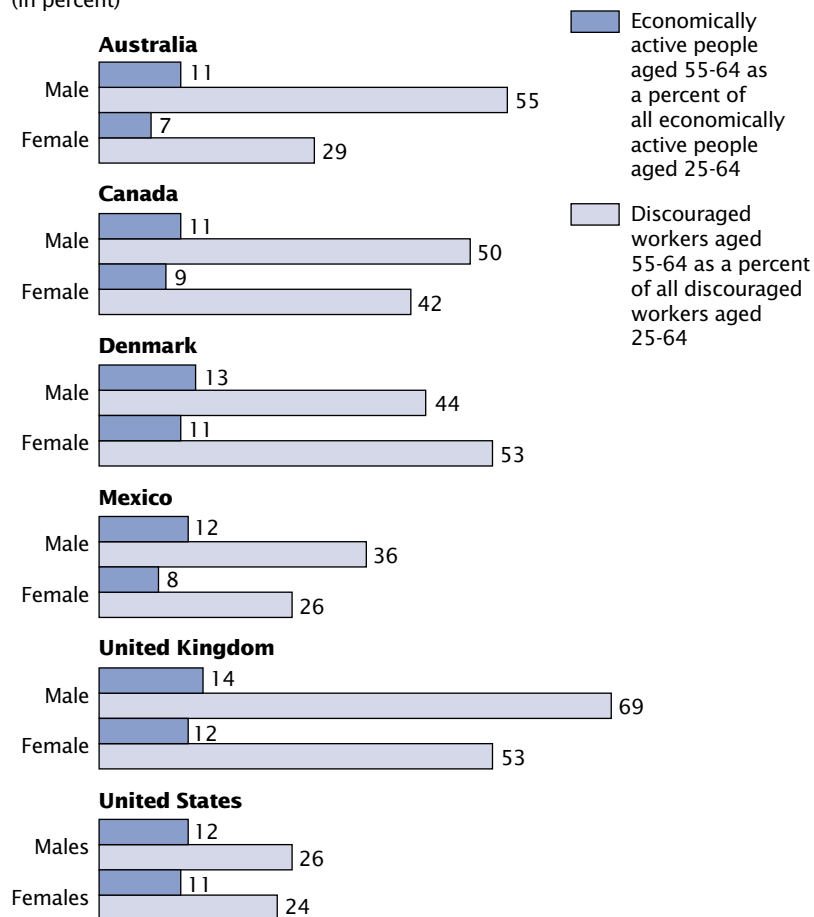
discouragement of older workers is thought to be related to changes in occupational structure and the subsequent need for a more-educated workforce which favor younger over older workers.

Cross-national data on discouraged workers are fairly sparse. One comparison of 13 countries for 1993 indicates that older workers make up a disproportionate share of all discouraged workers, except in Sweden. Illustrative data for six of these countries (Figure 10-10) show that while people aged 55 to 64 account for a small proportion of all economically active people, they account for a much larger proportion of all discouraged workers, especially in the United Kingdom where more than two-thirds of all discouraged male workers were aged 55 to 64. In countries with data over time, discouraged older workers were more numerous in the early 1990s than in the early 1980s. Discouragement seems to be more permanent among older workers, as they are less likely to re-enter the labor force than their younger counterparts. Survey data for 1990 for Belgium and France show that more than half of men aged 55 to 59 who had lost their jobs in the 3 years preceding the surveys were no longer in the labor force (OECD, 1995). The corresponding figure for all workers was closer to one-quarter. Because of the difficulties older people face in obtaining a new job, discouragement often becomes a transition from unemployment to retirement.

Figure 10-10.

Older Share of Economically Active Population and Discouraged Worker Population: 1993

(In percent)



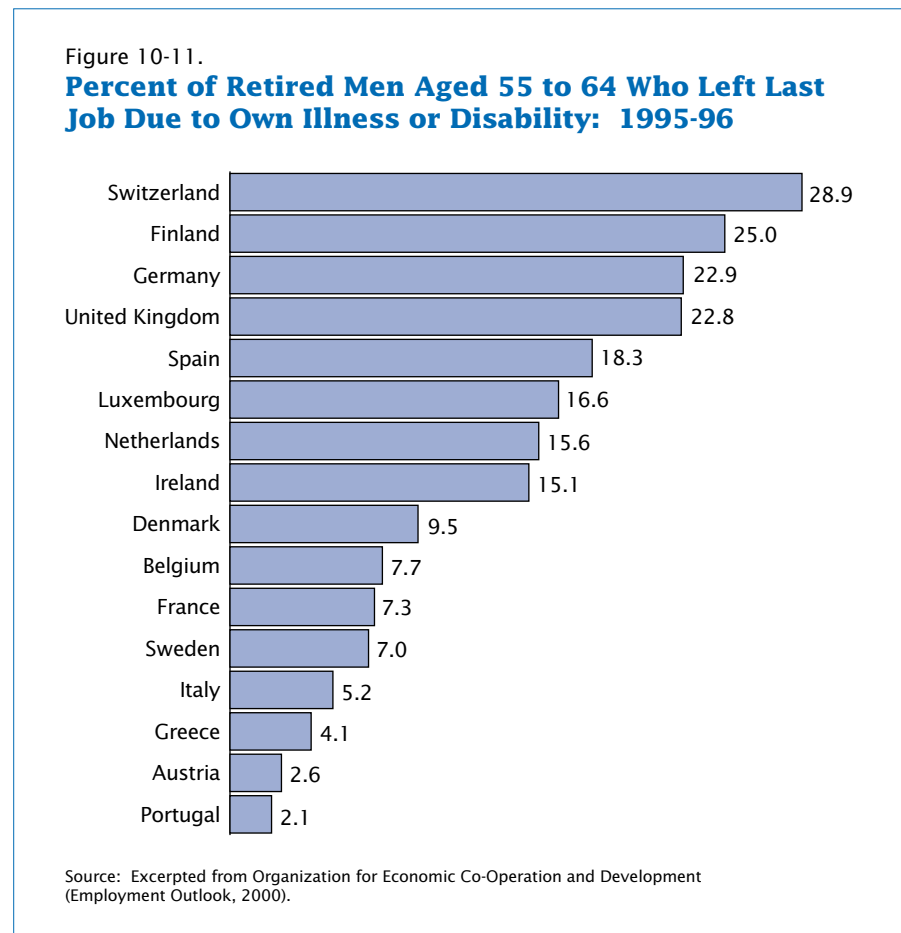
Note: Data for Norway include persons aged 64-74; data for the United States include people aged 65 and over.
Sources: Organization for Economic Co-Operation and Development, Employment Outlook 1995 and International Labour Office Yearbook of Labour Statistics, 1994.

INVALIDITY AND DISABILITY PROGRAMS MAY BE AVENUES TO RETIREMENT

Another path to retirement for older workers has been disability programs. In Europe during the last three decades, economic recessions and high unemployment led some governments (e.g., Germany, the Netherlands, Sweden) to encourage retirement by means of public measures such as disability schemes and 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 (OECD, 1992). Data for 1990 showed that the proportion of older people receiving an invalidity benefit could be very large, e.g., 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 their disability/invalidity programs during the last decade, it appears likely that the varying national provisions of such programs have an impact on retirement patterns. Comparative data for 16 European countries in the mid-1990s (Figure 10-11) show that the percentage of older retired men who retired due to their own illness or disability ranged from 2 percent in Portugal to 29 percent in Switzerland.

ACTUAL RETIREMENT AGE OFTEN LOWER THAN STATUTORY AGE

Over several decades, many industrialized nations lowered the standard age at which people become



fully entitled to public pension benefits. These reductions were propelled by a combination of factors including general economic conditions, changes in welfare philosophy, and private pension trends. The proliferation of early retirement schemes has increased the number and usually the proportion of older workers who avail themselves of such programs (Tracy and Adams, 1989).

One important issue for policymakers 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. In spite of the lowering of statutory retirement ages, the actual average age of retirement is lower than the statutory age in a large majority of industrialized countries. Of the 24 countries in Table 10-2, the actual age exceeds the standard age only in Greece, Japan, and Turkey, and also in Iceland for men and in Italy for women. In several countries (e.g., Austria, Belgium, and Finland), the average man retires 6 years or more before the standard retirement age. Differences are often greater for women, approaching 10 years in Luxembourg and the Netherlands.

Table 10-2.
**Standard and Actual Retirement Age in 24 Countries:
 1995**

Country	Male		Female	
	Standard	Actual	Standard	Actual
Australia	65	61.8	60	57.2
Austria	65	58.6	60	56.5
Belgium	65	57.6	60	54.1
Canada	65	62.3	65	58.8
Denmark	67	62.7	67	59.4
Finland	65	59.0	65	58.9
France	60	59.2	60	58.3
Germany	65	60.5	65	58.4
Greece	62	62.3	57	60.3
Iceland	67	69.5	67	66.0
Ireland	66	63.4	66	60.1
Italy	62	60.6	57	57.2
Japan	60	66.5	58	63.7
Luxembourg	65	58.4	65	55.4
Netherlands	65	58.8	65	55.3
New Zealand	62	62.0	62	58.6
Norway	67	63.8	67	62.0
Portugal	65	63.6	62.5	60.8
Spain	65	61.4	65	58.9
Sweden	65	63.3	65	62.1
Switzerland	65	64.6	62	60.6
Turkey	60	63.6	55	66.6
United Kingdom	65	62.7	60	59.7
United States	65	63.6	65	61.6

Note: The standard age of retirement (also called the statutory age) refers to the age of eligibility for full public pension benefits. The actual age reflects the estimated average age of transition to inactivity among older workers.

Source: Organization for Economic Co-Operation and Development, 1998 (Ageing Working Paper 1.4).

TREND IN EARLY RETIREMENT MAY BE CHANGING

The downward shift in the statutory age at retirement during the 1970s and 1980s in developed countries was accompanied by an increase in the number of public early retirement programs and a corresponding increase in the number of retirees leaving the labor force prior to the statutory age. Some countries promoted early retirement as a means of offsetting persistently high levels of unemployment. In Denmark, for example, a voluntary early retirement scheme was constructed to encourage older workers to leave the labor market (Petersen, 1991). Mandatory retirement practices and worsening

health of older workers were two other factors said to have increased early retirement. More recent research, however, discounts the importance of these factors (Levine and Mitchell, 1993; Blondal and Scarpetta, 1998; Fronstin, 1999) and points instead to changes in social security/private pension provisions as well as to improved economic status of older workers and increases in wealth overall. As Ruggles (1992) has noted in the context of the United States, comparisons of today's elderly with the elderly in previous decades suggest great increases in economic status. People entering the ranks of the elderly have higher educational attainment, higher-paid employment histories, and higher average

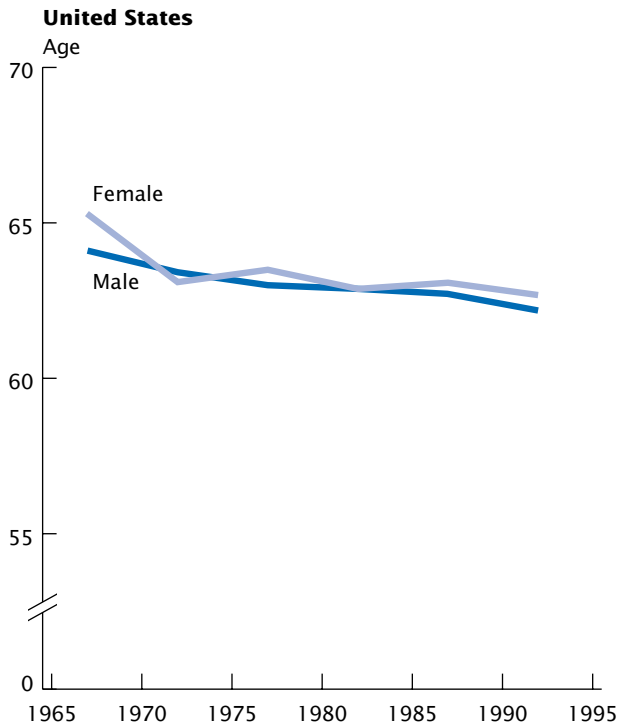
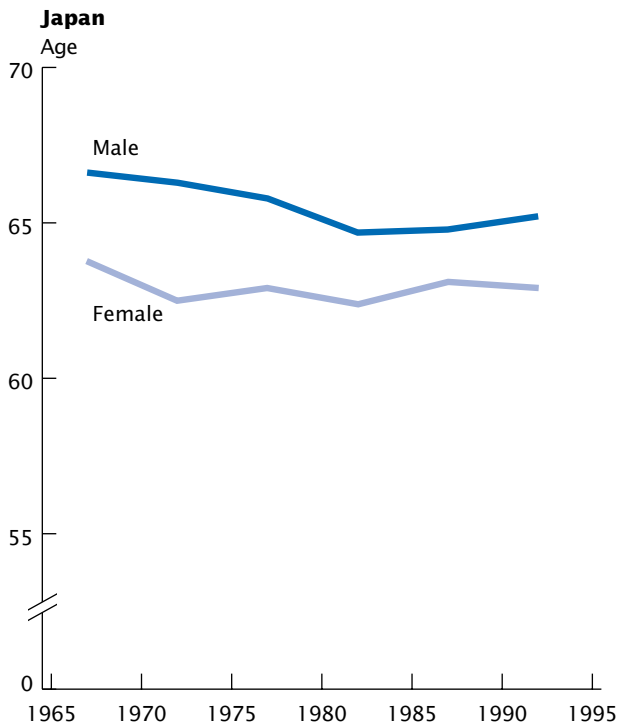
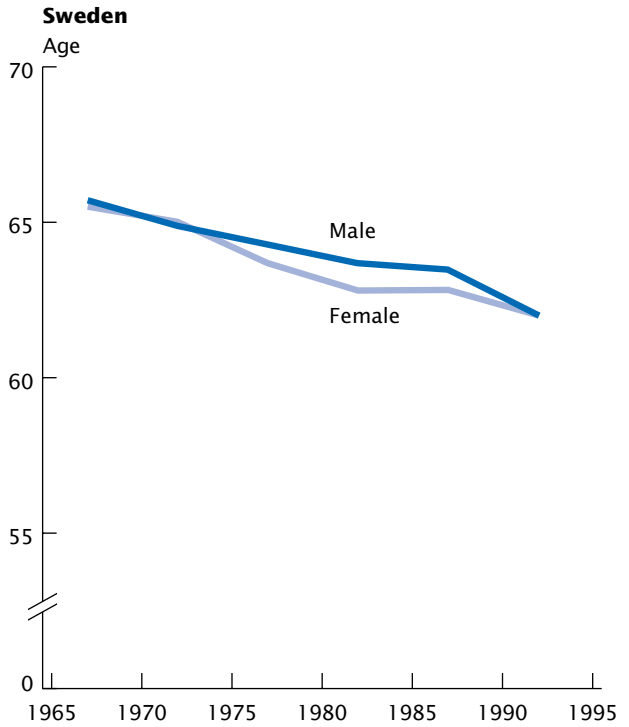
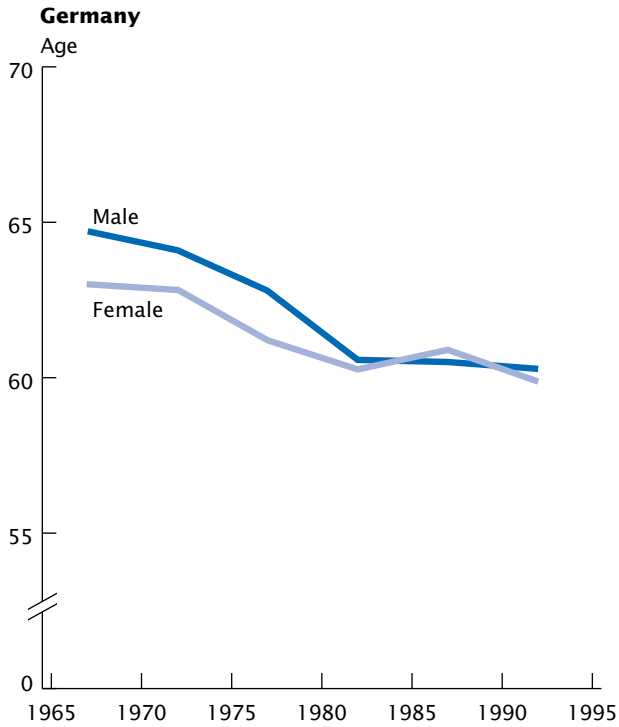
income than did earlier cohorts of elderly.

Some nations have raised (or are considering an increase in) statutory retirement age as one means of offsetting the fiscal pressures of population aging,⁴ in addition to fostering policies that encourage labor force participation at older ages. The effect of such actions is not yet certain. Data for nine OECD countries from 1975 to 1990 reveal a general downward trend in actual retirement age during the period 1975-1990, with an apparent leveling off in the latter part of the period. Gendell's (1998) analysis of Germany, Japan, Sweden, and the United States generally supports this picture (Figure 10-12). However, several studies have argued that the early retirement trend in the United States has stopped (Smeeding and Quinn, 1997; Burkhauser and Quinn, 1997; Quinn, 1997). Furthermore, a recent OECD (2000) analysis of employment rates notes that the rates for men aged 55 to 59 and 60 to 64 have increased slightly in the late 1990s in both the United States and the Netherlands, and have stopped declining in Canada, Germany, Finland, Japan, Sweden and the United Kingdom. The OECD study suggests that this change is related to the secular economic upturn in the latter 1990s.

⁴ 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 "normal" retirement age of 65 will edge higher in small increments until reaching 67 years in the year 2025 (Robertson, 1992). Germany's 1992 Pension Act also provides for a progressive increase in pensionable age beginning at the turn of the century.

Figure 10-12.

Average Age at Labor Force Exit in Four Countries: Late 1960s to Early 1990s



Source: Gendell, 1998.

ADULTS SPENDING GREATER PORTION OF LIFE IN RETIREMENT

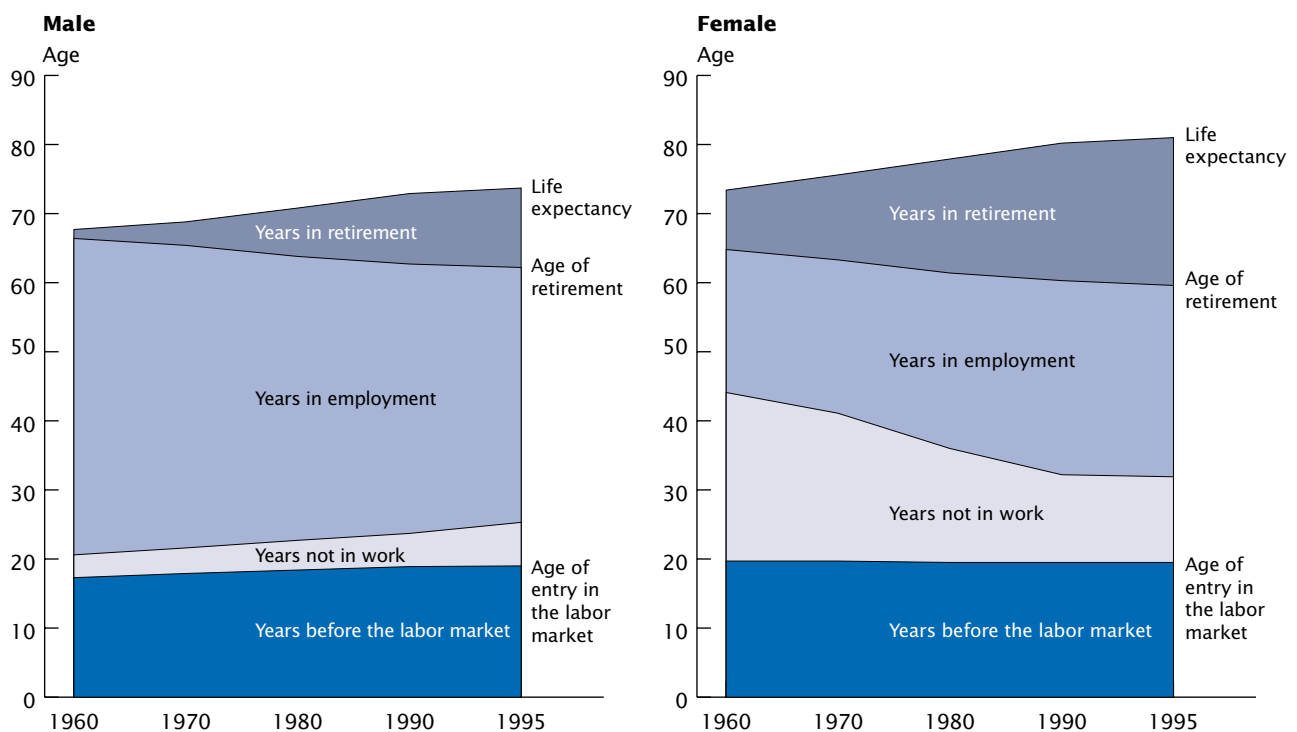
Gains in life expectancy during the twentieth century have intersected with declining retirement ages to produce an increase in the proportion of an individual's life spent in retirement. The OECD, using an average of unweighted data for 15 member countries, has decomposed the life course into four states:

years before entry into the labor market (primarily spent in school); years not in work due to unemployment and/or economic inactivity; years in the labor force; and years in retirement. Figure 10-13 shows that in 1960, men on average could expect to spend 46 years in the labor force and a little more than 1 year in retirement. By 1995, the number of years in the labor force had decreased to 37 while the

number of years in retirement had jumped to 12. Unlike the trend for men, the average number of years in employment for women has been increasing, reflecting the temporal changes in female labor force participation described earlier. At the same time, the amount of time women live after reaching retirement age increased greatly, from 9 years in 1960 to more than 21 years in 1995.

Figure 10-13.

Decomposition of the Life Course, OECD Average: 1960 to 1995



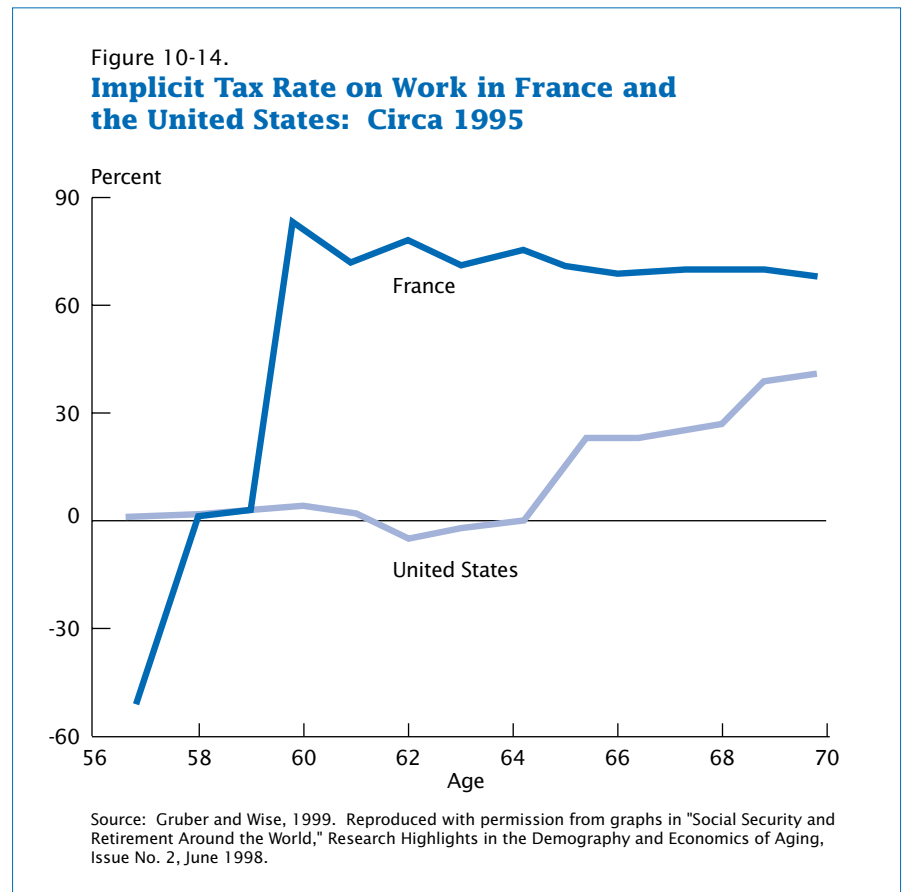
Note: Based on an unweighted average of data for 15 member countries, using average life expectancies and labor force patterns as they existed for the years shown. These graphs are illustrative of overall trends, and should not be construed as representing the experience of any particular age cohort. Source: Organization for Economic Co-Operation and Development, 1998b.

PUBLIC PENSION SYSTEM PROVISIONS SOMETIMES INDUCE EARLY RETIREMENT

Research has begun to consider national differences among labor force participation at older ages as a consequence (intended or unintended) of retirement provisions and/or tax policy. In some countries, retirement benefit payments are increased for people who postpone their retirement beyond the allowable early retirement age. In other countries, there is no future 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 which contrasts the longer stream of future benefit payments that a worker would receive by retiring at an early age versus the shorter stream of future payments that a worker might receive by delaying his/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, e.g., at age 65. Figure 10-14 compares the implicit tax rates on work in France and the United

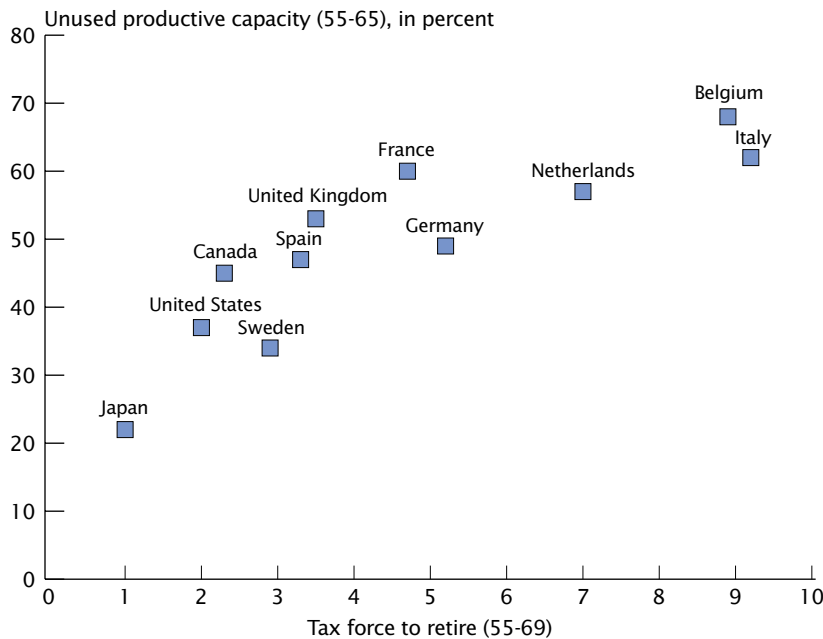
States. The age-specific retirement age in France shows a steep jump in retirement at age 60, which not

surprisingly corresponds to the large implicit tax rise at that age.

The same study also considered 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 (simply, the percentage of people aged 55 to 65 who were not working) reveals a strong cross-national relationship between the two (Figure 10-15). 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 largely contingent upon policy changes in these systems. This study also highlights the potential power of focusing on system design features, and stands as a powerful example of the importance of cross-national research on aging-related issues.

Figure 10-15.

Tax Rates and Unused Capacity in 11 Developed Countries: Circa 1995



Source: Gruber and Wise, 1999. Reproduced with permission from graphs in "Social Security and Retirement Around the World," Research Highlights in the Demography and Economics of Aging, Issue No. 2, June 1998.

CHAPTER 11.

Pensions and Income Security

Public pensions have become the financial lifeline of the elderly in many societies. While some European public pension systems date back to the end of the nineteenth century, current systems are the result of changes instituted largely after World War II. The most obvious and, to governments, most worrisome consequence of projected population aging will be an increase in budgetary outlays in the form of old-age pension payments, especially in those countries in which public pensions are predominantly financed on a pay-as-you-go basis. Increases in migration also are prompting governmental concern about the “exporting” of cash benefits to retirees in other countries (Bolderson and Gains, 1994). Many nations, both developed and developing, are now reconsidering their existing old-age security systems, often with an eye toward introducing or strengthening private pension schemes.

DEMOGRAPHIC CHANGE ALONE MAY DOUBLE RETIREE/WORKER RATIO

The potential effect of demographic change on future retired population/worker ratios, holding other factors constant, may be approximated in various ways. The most commonly used indicator, as discussed in Chapter 8, is an elderly support ratio which contrasts one population segment (people aged 65 and over) to another (people aged 20 to 64). One variation on this theme, shown in Figure 11-1 for 10 developed countries, allows for national differences in average

retirement age. This example is based on average ages of retirement for employees in 1995 estimated by the Organization for Economic Co-Operation and Development (OECD) and population age/sex structures for 2000 and 2030 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 all people between the age of 20 and the average retirement age, assuming no change in the average age of retirement between 2000 and 2030. The ratio increases notably over time in all cases, and more than doubles for men in the Netherlands.

PUBLIC OLD-AGE SECURITY SYSTEMS PROLIFERATING

Since the Second World War, public pension plans have played an increasingly important role in providing retirement income to older people. Old-age pension schemes have become social institutions in many if not most countries throughout the world. The goal of most public old-age pension schemes is to provide all qualifying individuals with an income stream during their later years, income which is: 1) continuous; 2) adequate; 3) constant, in terms of purchasing power; and 4) capable of maintaining the socioeconomic position of the retired in relation to that of the active population (Nektarios, 1982).

The major impetus for development of public pension systems, particularly in industrialized countries, was the inability of private intergenera-

tional transfers to provide adequate retirement income for older citizens. The number of countries with an old age/disability/survivors program increased from 33 in 1940 to 167 in 1999 (Figure 11-2). The World Bank (1994) has estimated that formal public programs provide coverage for approximately 30 percent of the world's older (aged 60 and over) population, with some 40 percent of the world's working-age population making contributions toward that support.

LABOR FORCE PENSION COVERAGE VARIES FROM UNIVERSAL TO NIL

Mandatory old-age pension plans now cover more than 90 percent of the labor force in most developed countries. Governments are responsible for mandating, financing, managing, and insuring public pensions. Public pension plans usually offer defined benefits that are not tied to individual contributions, but rather, 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 (Mortensen, 1992).

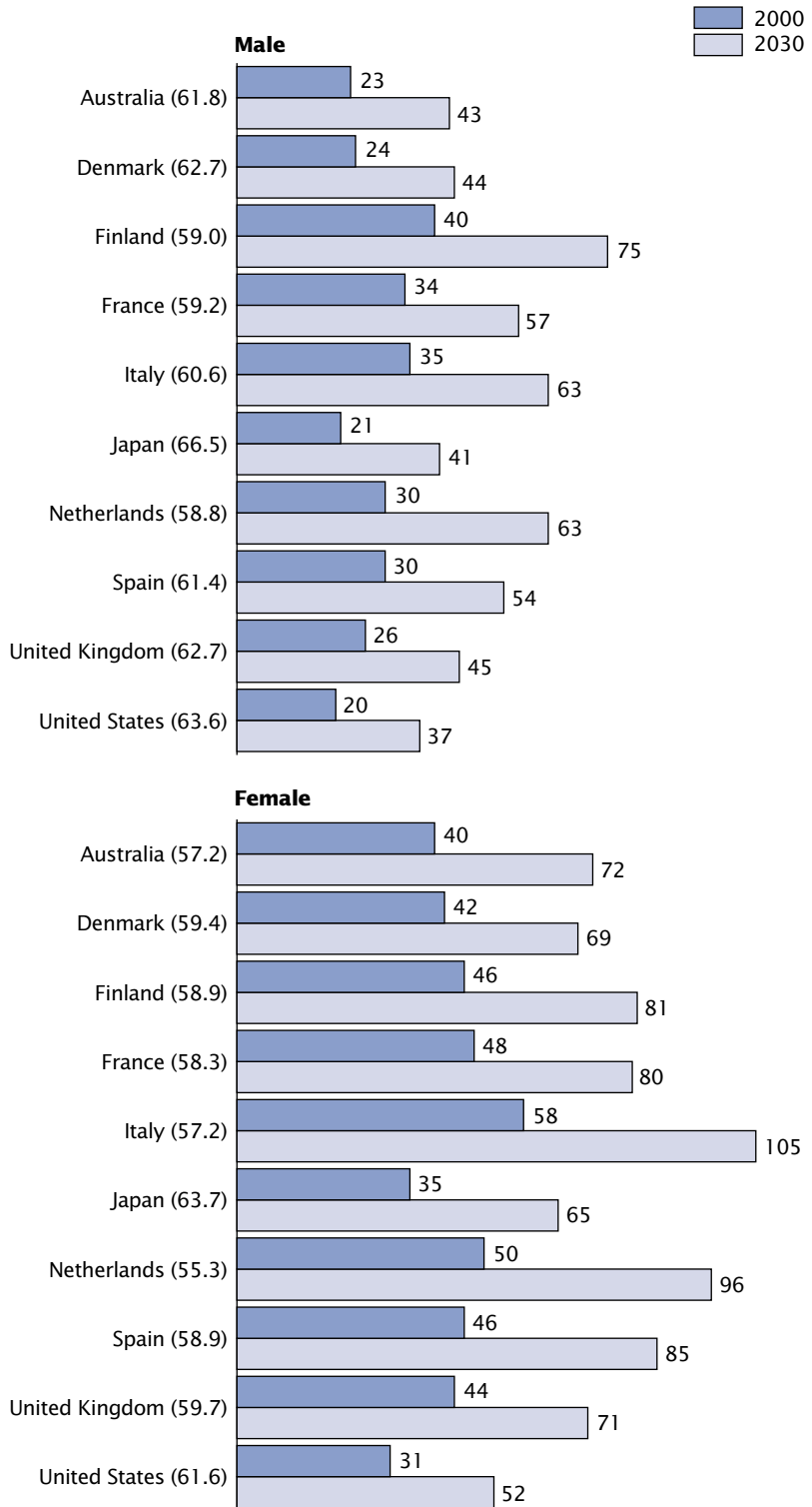
Most pay-as-you-go systems in industrialized countries initially promised generous benefits. These pension programs, at their inception, were based on a small number of pensioners relative to a large number of contributors (workers). As systems matured, ratios of pensioners to contributors grew and in some countries

became unsustainable, particularly during periods of economic stagnation. One result of such changes was the development of private pension systems to complement public pension systems (Fox, 1994). Other measures taken or considered have included increasing worker contribution rates, restructuring or reducing benefits, and raising the standard age of retirement (ISSA, 1993; Holtzmann and Stiglitz, 2001).

In developing countries, public pension systems typically cover a much smaller fraction of workers than in industrialized nations (Figure 11-3). Even economically vibrant societies such as Hong Kong and Thailand offer no publicly supported, comprehensive retirement pension scheme (Bartlett and Phillips, 1995; Domingo, 1995). In many cases, coverage in developing countries is restricted to certain categories of workers such as civil servants, military personnel, and employees in the formal economic sector. Rural, predominantly agricultural workers have little or no pension coverage in much of the developing world, although some governments have taken steps to address this situation. Each state in India, for example, has implemented an old age pension scheme for destitute people with no source of income and no family support (Kumar, 1998). While pension amounts are minimal and coverage far from universal, the formal institution of such a system affords a nation a foundation upon which to expand future coverage.

Figure 11-1.
Ratio of Retirement-Age to Working-Age Population in Ten Countries: 2000 and 2030

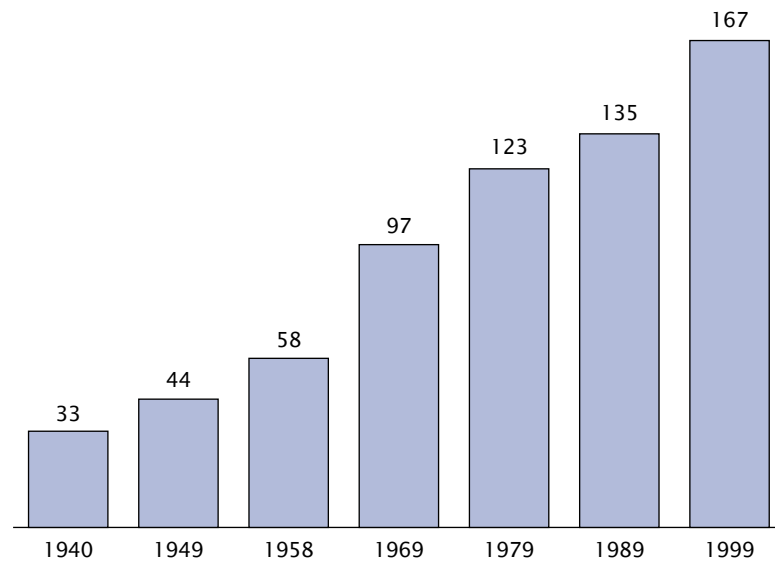
(Average retirement age shown in parentheses)



Note: Ratios represent the number of persons at or above average retirement age per 100 persons between age 20 and the average retirement age in 1995. Each national average is shown in parentheses.
 Sources: OECD, 1998 (Aging Working Paper 1.4) and U.S. Census Bureau, 2000a.

Figure 11-2.

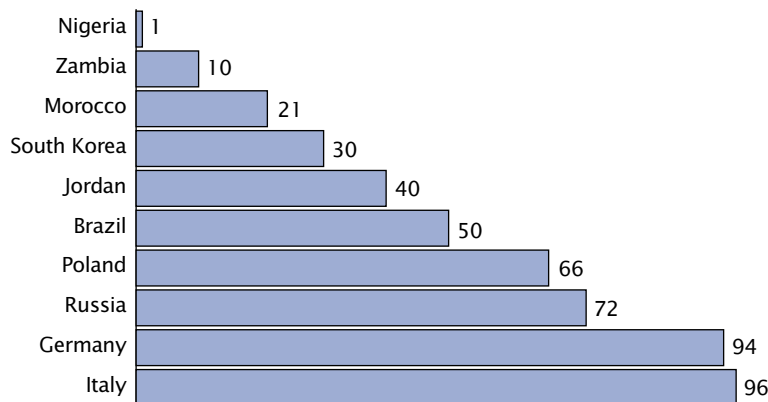
Number of Countries With Public Old-Age/Disability/Survivors Program: 1940 to 1999



Source: U.S. Social Security Administration, 1999.

Figure 11-3.

Percent of Labor Force Covered by Public Old-Age Pension Program: Circa 1995



Source: World Bank, 1998.

Informal (usually family) systems provide the bulk of social support for older individuals in many countries, particularly in Africa and South Asia. As economies expand and nations urbanize, informal support systems such as extended family care and mutual aid societies have tended to weaken. A major challenge for governments in developing nations is to effect the expansion of formal-system coverage (especially in rural areas) while maintaining support for extant informal mechanisms.

HOW GENEROUS ARE PUBLIC PENSIONS?

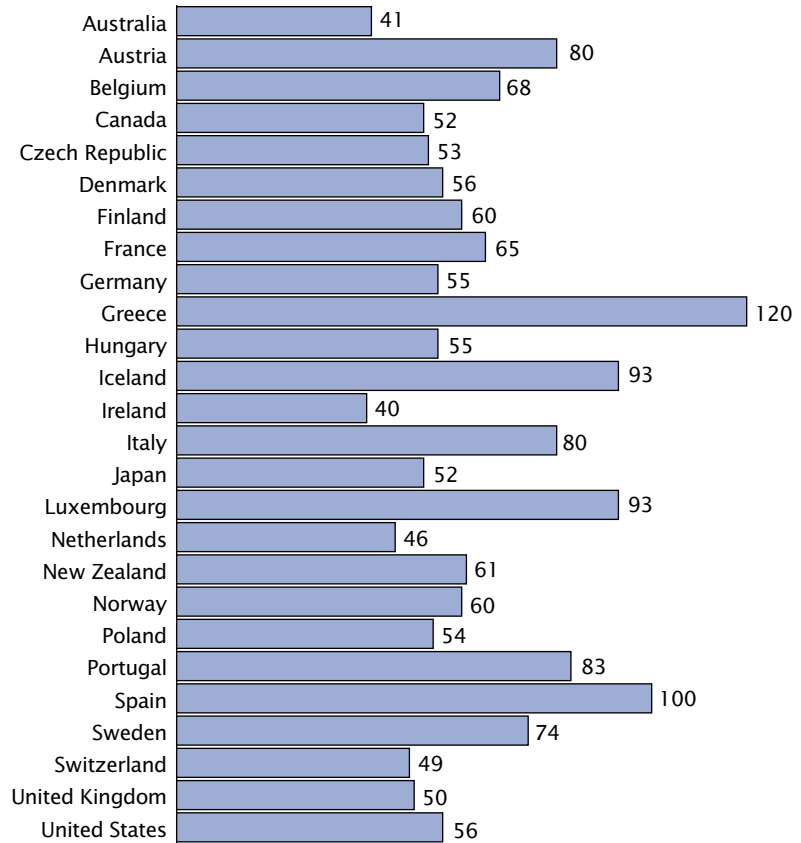
The “value” of pensions can be construed and measured in different ways, depending on how many and which people in a given household rely on pension income, the taxable status of such income, the type of job a retiree was engaged in, the level of pension income in a given society vis-a-vis other benefits 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 pre-retirement income is supplied by her/his pension. MacKellar and McGreevey (1999) note that, in industrialized countries, the average pension rose from 14 percent of the average wage in 1930 to 55 percent in 1980. A comparison of gross income replacement of social security and other compulsory retirement pension programs in 12 European nations circa 1990 (International Benefits Information

Service, 1993) revealed that replacement rates ranged from 46 percent to 102 percent, based on average annual pay for a manufacturing worker with dependent spouse.

For reasons mentioned above, there is no single replacement rate in any national retirement program, and cross-national comparisons therefore are difficult. For comparative purposes, however, the OECD has constructed, for 1995, a synthetic indicator of the expected gross replacement rate (as a percent of earnings) for a 55-year-old individual who retires at the standard age of entitlement to a public pension. This indicator takes account of two earnings levels (average and two-thirds of average) and two types of households (single earner and worker with a dependent spouse). Pensions in some countries can be expected to replace a large percentage of earnings, and even to match or exceed the latter in Greece and Spain. At the other end of the spectrum are Australia and Ireland, where the public-pension replacement rates are on the order of 40 percent. For the majority of countries examined, the expected replacement rates are about one-half to two-thirds of pre-retirement income (Figure 11-4).

Figure 11-4.
Expected Old-Age Public Pension Replacement Rate in 26 Countries: 1995

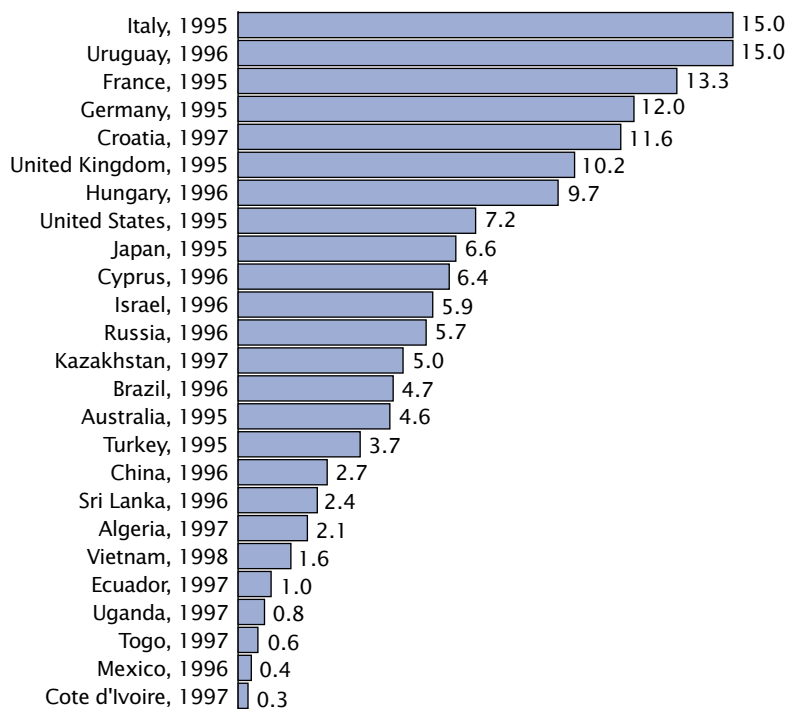
(Percent)



Note: Synthetic indicator based on different earning levels and household types; see text and source for more detail.
 Source: OECD, 1998 (Aging Working Paper 1.4).

Figure 11-5.

Public Pension Expenditure as a Percent of Gross Domestic Product in 25 Countries: Circa 1996



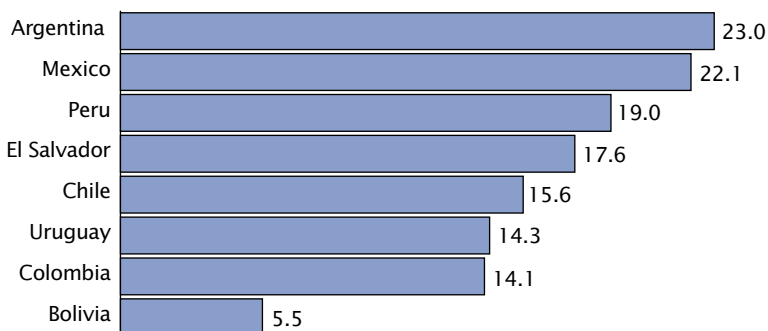
Source: Palacios and Pallares-Miralles, 2000.

PUBLIC PENSIONS ABSORB ONE-SEVENTH OF GDP IN SOME COUNTRIES

The cost of public pensions generally is greatest among industrial nations, most of which have pay-as-you-go systems. Pension expenditure had, on average, come to exceed 9 percent of gross domestic product (GDP) in OECD nations in the early 1990s, and represented 8 percent of GDP in Eastern Europe. Between 1960 and 1990, one-quarter of the increase in total public expenditure in OECD countries was growth in pension expenditure; on average, the latter grew twice as fast as did GDP. By 1996, public pension spending in Italy and Uruguay had reached 15 percent of GDP (Palacios and Pallares-Miralles, 2000). Expenditure levels typically are much lower in most developing countries (Figure 11-5), where relatively younger populations and smaller pension programs do not yet place large demands on GDP.

Figure 11-6.

Net Administrative Fees as a Percent of Total Contributions in Eight Latin American Individual-Account Systems: 1999



Source: James, Smalhout and Vittas, 2001.

ADMINISTRATIVE COSTS OF PUBLIC PENSION SYSTEMS HIGH IN SOME DEVELOPING COUNTRIES

The cost of administering a public pension scheme is an important factor in the scheme's overall efficacy. In many developing countries, administrative costs as a percent of total old-age benefits have been high (e.g., 10-15 percent in Brazil and Turkey) relative to the developed world — administrative costs as a percent of old-age benefits are less than 2 percent in most OECD countries. In many developed countries, the cost/benefit ratio declined in the 1970s and early

1980s (Estrin, 1988) as a result of: 1) government austerity programs that helped contain administrative costs; 2) increases in total benefit expenditures, reflecting not only the maturation and/or expansion of programs but also the impact of inflation; and 3) greater use of computers for the processing of benefits, with corresponding gains in efficiency.

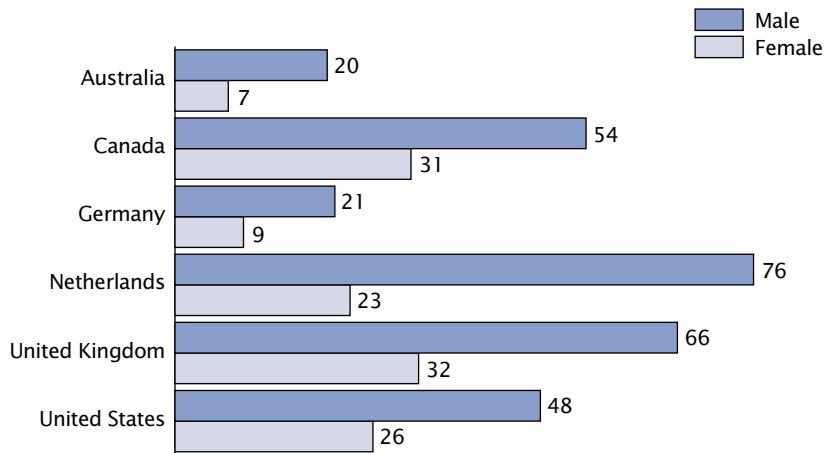
The World Bank (1994) compiled information on administrative costs per participant in publicly managed pension plans as a percent of per capita income in the early 1990s, demonstrating that such costs were considerably higher in lower-income countries. For example, costs per participant as a percent of national per capita income were 8 percent in Tanzania, 7 percent in Burundi, and 2.3 percent in Chile, compared with one-tenth of 1 percent or less in Switzerland and the United States. These data illustrate the importance of an educated labor force, communications infrastructure, and other advanced technological input to the pension production function. More recently, James, Smalhout, and Vittas (2001) estimated the net administrative fee in individual account systems as a percent of a person's total contribution in eight Latin American countries (Figure 11-6). These fees were in double digits in seven of the eight nations as of 1999, and exceeded 20 percent in Argentina and Mexico.

ROUGHLY ONE-THIRD OF OECD WORKERS COVERED BY OCCUPATIONAL PENSION PLANS

While public pension systems are more widespread than occupational pension plans, the latter are growing in coverage. Occupational pension plans tend to be a more important source of retirement income than public pensions for

Figure 11-7.

Percent of Pensioners With Income From Employer-Provided Pensions: Late 1990s



Source: Whitehouse, 2000.

high income workers in developed countries. About one-third of the labor force in OECD countries was enrolled in occupational pension plans circa 1990, but a much smaller proportion is covered in most developing countries and transitional economies, where employer-sponsored schemes tend to cover only public-sector workers (World Bank, 1994).

Cross-national estimates of occupational-scheme coverage among all workers vary widely in the published literature, due in part to different temporal references as well as different definitions of what an occupational scheme is.¹ 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 a result of collective bargaining. Switzerland requires all

¹ For a useful discussion of occupational pension schemes within the context of broader retirement system reforms, see OECD, 1998, Ageing Working Paper 3.4.

employers to provide pension benefits for employees above a certain income level. OECD estimates for the early 1990s, compiled from various sources, show occupational scheme coverage in 19 industrialized countries ranging from 5 percent in Italy and Greece to 90 percent in Sweden and the Netherlands (OECD, 1998, Ageing Working Paper 2.2).

Of course, not all workers who are covered by occupational plans are in fact enrolled in them. Further, the percent of older people actually receiving benefits from employer-provided plans is likely to be lower still, because many retirees either did not have access to such plans during their working years, or did not participate for enough years to become vested. Whitehouse (2000) has compiled data on the percentage of pensioners with income from employer-provided pensions in eight developed countries in the late 1990s (Figure 11-7). In countries where a gender breakdown is

Box 11-1.

Chile is the Developing-Country Model for Pension Privatization

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, 1992). 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

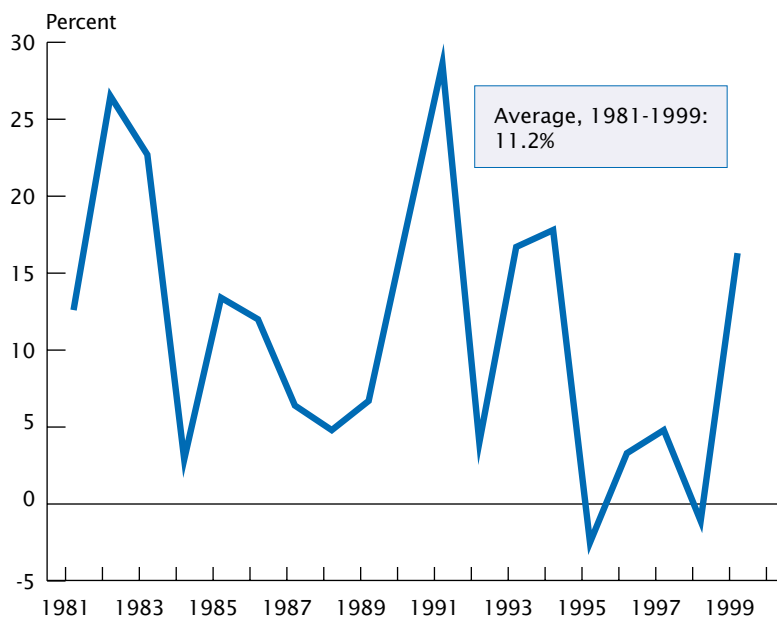
administered retirement fund (additional payroll deductions are made for life insurance and fund expenses). Workers themselves select from many competing investment companies, are free to switch their accounts, and have several options for withdrawal and annuities upon retirement. To reduce mismanagement risks, the government assumes a major supervisory and regulatory role (Schulz, 1993).

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 1998, however, annual rates of return were much lower and in 2 years were negative, before rebounding in 1999 (Figure 11-8). Overall, the long-term (19-year) average real return exceeds 11 percent. Observers have pointed out several drawbacks to the system, such as

high administrative costs, workers' loss of freedom vis-a-vis one-tenth of their earnings, and the fact that eventual income replacement rates are not guaranteed, i.e., are reliant on investment earnings that may suffer in times of economic stagnation (Gillion and Bonilla, 1992). Nevertheless, many countries in Latin America, Eastern Europe, and Asia have adopted or are seriously considering aspects of the Chilean system, or are experimenting with variations on the theme (Kritzer, 2000; Fox and Palmer, 2001). Consideration of increased privatization of social security systems is now commonplace in much of the developed world as well, and has become a hotly debated political topic.

Figure 11-8.

Real Rate of Return of Chile's Private Pension System: 1981 to 1999



Source: Reported in Palacios and Pallares-Miralles, 2000.

available, the data show that men are much more likely to receive such benefits, as would be expected from past gender patterns of labor force participation.

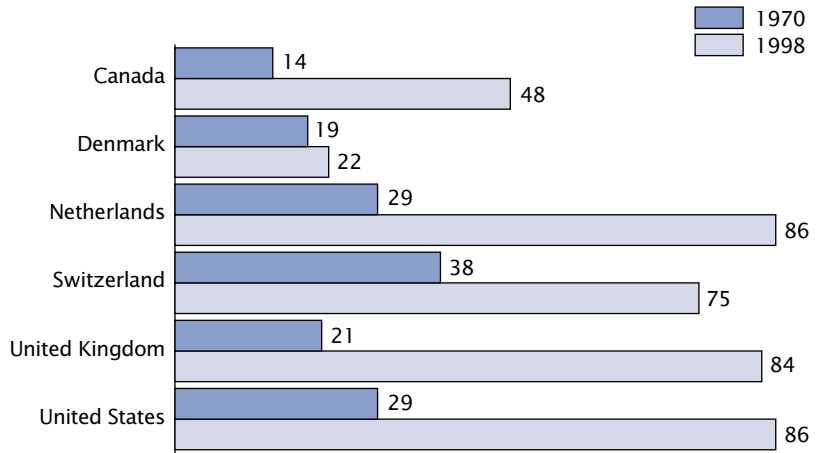
Company-based pension programs in the developing world are found most frequently in former British colonies and in countries with large multinational subsidiaries. Most such programs are subject to less regulation and lower funding requirements than their counterparts in industrialized countries, although both Indonesia and South Africa have developed comprehensive and well-regulated private pension systems. Coverage of private-sector workers is increasing in a number of other large developing nations such as Brazil, India, and Mexico (World Bank, 1994).

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

Private pension fund assets are sizeable in many developed countries. In 1998, such assets were equivalent to more than 80 percent of GDP in the Netherlands, the United Kingdom, and the United States (Figure 11-9). Most occupational-plan funds have been invested in private-sector assets, are internationally diversified, and have earned higher returns than publicly managed funds (Davis, 1993; 1998).

These funds have grown considerably over the last three decades. The average annual growth rate of pension funds for OECD countries as a whole between 1990 and 1996 was 11 percent (OECD, 1998b).

Figure 11-9.
Private Pension Fund Assets as a Percent of GDP: 1970 and 1998



Note: Later Swiss figure refers to 1996.
Sources: World Bank, 1994 and OECD, 2000.

Table 11-1.
Payroll Tax Rates for Provident Fund Schemes: Early-to-Mid-1990s

(Percentage of wages)

Country	Employees	Employer
Africa		
The Gambia	5	10
Ghana	5	12.5
Kenya	5	5
Nigeria	6	6
Swaziland	5	5
Tanzania	10	10
Uganda	5	10
Zambia	5	5
Asia		
Fiji	7	7
India	10	10
Indonesia	1	2
Kiribati	5	5
Malaysia	9	11
Nepal	10	10
Singapore	7-30	10
Solomon Island	5	8
Sri Lanka	8	12
Western Samoa	5	5
Latin America		
Argentina	11	0
Chile	13	0
Colombia	3	9
Peru	13	0

Source: World Bank, 1994.

This increase is expected to continue for at least the short term, because many aging nations with relatively underdeveloped pre-funded systems have considerable room for growth. The looming policy question is whether population aging will depress rates of return on private pension funds. As the large post-World War II cohorts move into retirement, they are expected to divest some of their financial assets accumulated during their working years. This prospect highlights the importance of the nature of pension fund management, changes in government regulations, and the varying sociocultural impetuses for retirement savings (OECD, 2000; National Research Council, 2001).

PROVIDENT FUNDS PARAMOUNT IN SOME DEVELOPING COUNTRIES

A provident fund is a form of compulsory defined-contribution 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. Except in some Latin American countries, employers match or exceed the employee contribution. Although provident funds can cover private-sector workers, they are managed publicly.

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 40 years. By the mid-1990s more than 20 nations had developed such schemes (Table 11-1). 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.

The performance of provident funds globally has been erratic. In some East Asian countries (notably Singapore, which has the world's largest provident fund), funds typically have earned positive annual investment returns. In other nations, inflation and poor economic growth have lessened the value of fund contributions; in Sri Lanka, for example, the real annual rate of return for the Employee Provident Fund in the 1980s and early 1990s often was negative (International Labour Office, 1993). Such performance has led several countries to abandon provident schemes in favor of defined-benefit pension plans (Palacios and Pallares-Miralles, 2000).

ARE LIVING STANDARDS OF THE ELDERLY CHANGING IN DEVELOPED COUNTRIES?

Given the maturation of public pensions systems, increases in the level of female labor force participation, and the development of private pension schemes, one might expect that older citizens in industrialized nations are better off, economically, than previous generations of elderly people. And, there is a growing perception in some countries that the elderly as a whole are faring better than other population subgroups. However, the complexity of measuring economic well-being often precludes a definitive assessment of these issues, and there is considerable concern about the willingness and ability of households to adequately save for retirement needs (see, e.g., MacKellar, 2000). One study of 12 European Union countries in the late 1980s compared survey data on consumption expenditure, income, and

nonmonetary indicators of welfare, and concluded that in all 12 nations, the nonelderly were better off than the elderly (Tsakoglou, 1996). Data for France, however, suggest that extreme poverty (below the level of guaranteed minimum income) is much less common among the elderly than among younger households (David and Starzec, 1993).

The OECD (2000) has concluded that there has been a stable or improving economic picture for older people, both in absolute terms and relative to the nonelderly population. Poverty rates for older people have declined in most nations, as has the share of older people among the poor. In the United States, the overall situation of elderly people improved dramatically during the last third of the twentieth century. Studies of real median household income (adjusted for household size) have demonstrated much larger gains for elderly people relative to the general population (Radner, 1995; McNeil, 1998). And, poverty among the elderly has declined. One-third of all U.S. elderly were below the poverty line in 1960; by the mid-1990s, the level had declined to 10 percent, lower than among children under the age of 18 (Friedland and Summer, 1999).

Data from the Luxembourg Income Study reveal considerable inter-country variation in poverty rates among elderly citizens. An analysis of standardized information from nine nations (Smeeding and Saunders, 1998) suggests that Canada, Germany, and Hungary provide their elderly the best overall protection from poverty relative to the other six countries (Figure 11-10). This analysis also highlights the fact that overall figures may

mask large differences among population subgroups, as seen in the data for elderly women living alone. The economic vulnerability of single elderly women also has been noted in a 14-country study of data from the European Community Household Panel (Heinrich, 2000).

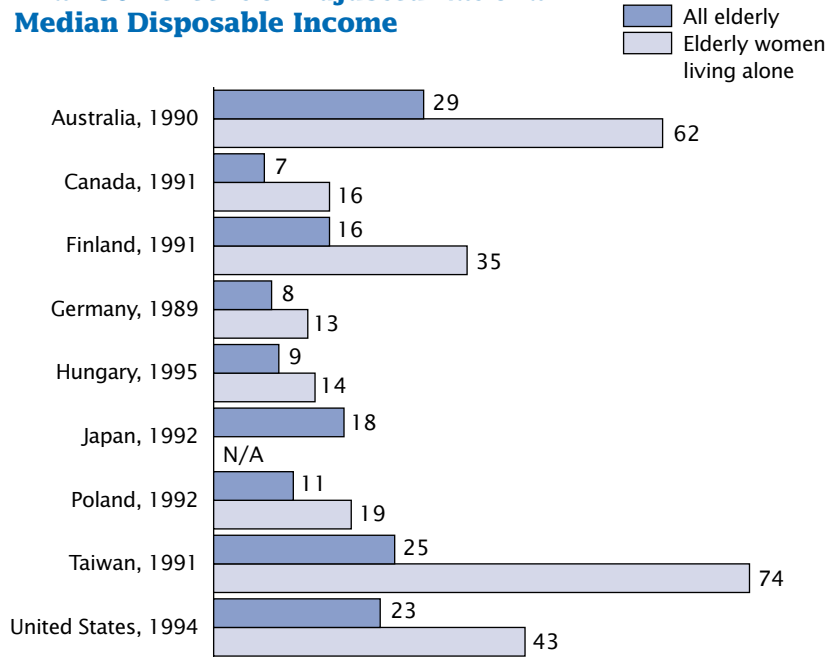
One obviously important component of elderly living standards is health care and its costs. As the latter have escalated in the 1990s, a growing body of research has focused on identifying the costs of specific illnesses and on projecting health expenditures (see, e.g., Cutler and Meara, 1999; Mayhew, 1999; and OECD, 2000). Other major thrusts of current research in the economics of aging seek: to more fully and accurately measure levels of household wealth and assets; to better assess differences in these variables within populations; and to understand transitions in income and poverty status, particularly as they relate to changing health status at older ages. Data from the European Community Household Panel Survey is beginning to shed light on the interplay of health status and retirement decisions of older European couples

(Jimenez-Martin, Labeaga, and Granado, 1999). In order to capture the complexity of such transitions and understand their significance for policy planning, several nations have mounted (or are planning to initiate) longitudinal studies akin to

the Health and Retirement Survey in the United States (see Burkhauser and Gertler, 1995 for a comprehensive overview of this study, and National Research Council, 2001 for future recommendations).

Figure 11-10.

Percent of Elderly Living in Households With Less Than 50 Percent of Adjusted National Median Disposable Income



Note: Percent for elderly women living alone in Japan is not reported.
Source: Smeeding and Saunders, 1998.

APPENDIX A.
Detailed Tables

Table 1.
Total Population, Percent Elderly, and Percent Oldest Old: 1975, 2000, 2015, and 2030

(In thousands)

Country	1975				2000			
	Total population	Percent of population 65+	Percent of population 80+	80+ as a percent of 65+	Total population	Percent of population 65+	Percent of population 80+	80+ as a percent of 65+
United States	220,165	10.5	2.1	20.4	275,563	12.6	3.3	26.5
Western Europe								
Austria	7,579	14.9	2.3	15.5	8,131	15.4	3.4	22.2
Belgium	9,796	13.9	2.3	16.4	10,242	16.8	3.5	20.8
Denmark	5,060	13.4	2.4	18.0	5,336	14.9	4.0	26.7
France	52,699	13.5	2.5	18.3	59,330	16.0	3.7	23.3
Germany	78,679	14.8	2.2	14.6	82,797	16.2	3.5	21.6
Greece	9,047	12.2	2.1	17.1	10,602	17.3	3.5	20.2
Italy	55,441	12.0	1.9	16.0	57,634	18.1	4.0	22.2
Luxembourg	362	13.0	2.2	17.0	437	14.0	3.0	21.2
Norway	4,007	13.7	2.5	18.2	4,481	15.2	4.4	28.6
Sweden	8,193	15.1	2.7	17.8	8,873	17.3	5.0	29.2
United Kingdom	56,226	14.0	2.4	17.0	59,508	15.7	4.0	25.5
Eastern Europe								
Bulgaria	8,722	10.9	1.4	12.8	7,797	16.5	2.2	13.2
Czech Republic	9,997	12.9	1.7	13.5	10,272	13.9	2.4	17.1
Hungary	10,532	12.6	1.7	13.3	10,139	14.6	2.5	17.4
Poland	34,022	9.5	1.2	12.4	38,646	12.3	2.1	16.8
Russia	134,233	8.9	1.2	14.0	146,001	12.6	2.0	15.9
Ukraine	49,016	10.5	1.6	15.0	49,153	13.9	2.2	16.0
North America/Oceania								
Australia	13,900	8.7	1.5	17.4	19,165	12.4	3.0	24.0
Canada	23,209	8.4	1.6	19.3	31,278	12.7	3.1	24.8
New Zealand	3,083	8.7	1.4	16.4	3,820	11.5	2.9	25.0
Asia								
Bangladesh	76,582	3.6	0.3	8.4	129,194	3.3	0.5	15.0
China	927,808	4.4	0.6	12.5	1,261,832	7.0	0.9	13.1
India	620,701	3.8	0.3	8.1	1,014,004	4.6	0.6	13.1
Indonesia	135,666	3.2	0.3	8.6	224,784	4.5	0.4	10.0
Israel	3,455	7.8	1.0	12.3	5,842	9.9	2.4	23.9
Japan	111,524	7.9	1.1	13.5	126,550	17.0	3.7	21.7
Malaysia	12,258	3.7	0.5	13.3	21,793	4.1	0.5	13.5
Pakistan	74,734	3.0	0.3	10.9	141,554	4.1	0.5	13.3
Philippines	43,010	2.7	0.4	13.4	81,160	3.6	0.5	13.6
Singapore	2,263	4.1	0.4	9.7	4,152	6.8	1.5	21.3
South Korea	35,281	3.6	0.4	10.1	47,471	7.0	1.0	13.9
Sri Lanka	13,603	4.1	0.5	13.2	19,239	6.5	1.0	15.6
Thailand	41,359	3.0	0.3	10.9	61,231	6.4	0.9	13.9
Turkey	40,025	4.5	0.4	7.9	65,667	6.0	0.9	15.2
Latin America/Caribbean								
Argentina	26,049	7.6	0.9	12.1	36,955	10.4	2.2	21.7
Brazil	108,167	3.9	0.5	12.5	172,860	5.3	0.8	15.3
Chile	10,337	5.3	0.8	14.5	15,154	7.2	1.2	16.8
Colombia	25,381	3.6	0.4	11.8	39,686	4.7	0.6	12.2
Costa Rica	1,968	3.4	0.5	13.6	3,711	5.2	0.9	17.9
Guatemala	6,018	2.8	0.4	13.1	12,640	3.6	0.5	13.5
Jamaica	2,013	5.8	0.8	14.5	2,653	6.8	1.5	21.6
Mexico	59,099	4.0	0.7	17.9	100,350	4.3	0.6	14.9
Peru	15,161	3.5	0.3	9.1	27,013	4.7	0.7	15.0
Uruguay	2,829	9.6	1.6	16.9	3,334	12.9	2.7	21.2
Africa								
Egypt	38,841	4.2	0.4	9.7	68,360	3.8	0.4	10.2
Kenya	13,741	3.7	0.5	12.8	30,340	2.7	0.4	13.0
Liberia	1,609	3.7	0.9	23.3	3,164	3.4	0.6	16.8
Malawi	5,244	2.2	0.2	8.0	10,386	2.8	0.3	9.9
Morocco	17,305	3.7	0.5	14.2	30,122	4.6	0.7	14.2
Tunisia	5,668	3.5	0.5	13.1	9,593	6.0	0.8	13.3
Zimbabwe	6,143	2.6	0.3	9.9	11,343	3.5	0.5	14.7

Table 1.
Total Population, Percent Elderly, and Percent Oldest Old: 1975, 2000, 2015, and 2030—Con.

(In thousands)

Country	2015				2030			
	Total population	Percent of population 65+	Percent of population 80+	80+ as a percent of 65+	Total population	Percent of population 65+	Percent of population 80+	80+ as a percent of 65+
United States	312,524	14.7	3.8	25.8	351,326	20.0	5.3	26.4
Western Europe								
Austria	8,316	18.8	4.9	26.2	8,278	25.2	7.0	27.9
Belgium	10,336	19.4	5.7	29.3	10,175	25.4	7.3	28.8
Denmark	5,521	18.9	4.4	23.6	5,649	23.0	7.1	30.8
France	61,545	18.8	5.8	30.9	61,926	24.0	7.5	31.2
Germany	85,192	20.2	5.4	26.6	84,939	25.8	7.2	28.1
Greece	10,735	20.6	6.3	30.5	10,316	25.4	7.8	30.8
Italy	56,631	22.2	6.8	30.5	52,868	28.1	9.0	32.1
Luxembourg	519	15.3	4.1	27.1	580	19.8	5.2	26.2
Norway	4,767	17.4	4.6	26.3	5,018	22.0	6.6	30.0
Sweden	8,900	21.4	5.7	26.8	8,868	25.1	8.6	34.3
United Kingdom	61,047	18.4	4.9	26.8	61,481	23.5	7.0	29.7
Eastern Europe								
Bulgaria	6,663	20.2	4.6	23.0	5,668	25.9	7.2	27.8
Czech Republic	10,048	18.8	4.2	22.3	9,409	24.7	7.4	30.0
Hungary	9,666	17.6	4.3	24.2	9,034	22.5	6.3	27.9
Poland	38,668	15.0	3.8	25.1	37,377	22.2	5.5	24.8
Russia	141,073	13.8	3.1	22.7	132,859	20.5	4.1	20.0
Ukraine	45,294	15.0	3.2	21.1	42,273	19.7	4.2	21.5
North America/Oceania								
Australia	21,697	15.8	4.1	25.9	23,497	21.1	6.0	28.5
Canada	35,653	16.1	4.3	26.8	39,128	22.9	6.2	26.9
New Zealand	4,396	13.7	3.5	25.7	4,768	17.8	5.0	28.2
Asia								
Bangladesh	160,486	4.4	0.6	12.5	184,478	7.2	1.0	13.5
China	1,397,414	9.5	1.7	18.0	1,483,121	16.0	2.9	18.3
India	1,241,572	5.9	0.9	14.5	1,437,103	9.0	1.4	15.7
Indonesia	275,152	6.2	1.1	16.9	312,592	10.9	1.7	15.6
Israel	6,992	11.1	3.0	26.6	7,873	14.9	3.9	26.5
Japan	125,843	24.9	7.0	28.2	116,740	28.3	11.1	39.3
Malaysia	28,414	5.9	0.8	14.3	35,306	9.4	1.6	16.9
Pakistan	185,715	4.5	0.7	15.0	226,251	6.5	0.9	14.4
Philippines	106,098	4.9	0.7	14.6	129,448	7.7	1.2	15.9
Singapore	6,646	8.7	2.1	24.1	9,047	14.8	3.0	20.4
South Korea	52,239	11.3	2.2	19.3	53,763	19.5	4.2	21.3
Sri Lanka	21,527	9.5	1.7	17.7	22,937	15.2	3.1	20.2
Thailand	68,139	9.8	1.8	18.0	71,311	16.4	3.1	19.3
Turkey	76,685	7.9	1.6	19.9	84,195	12.9	2.4	18.7
Latin America/Caribbean								
Argentina	42,916	11.8	3.1	26.0	47,229	14.7	4.0	27.3
Brazil	192,313	8.1	1.5	18.7	203,489	13.2	2.7	20.6
Chile	17,405	10.7	2.1	19.3	18,915	16.4	3.7	22.3
Colombia	49,189	6.5	1.0	15.6	57,666	11.5	1.8	15.9
Costa Rica	4,583	7.3	1.4	19.2	5,272	12.8	2.4	18.9
Guatemala	18,105	4.1	0.7	17.8	24,038	5.6	1.0	17.6
Jamaica	2,992	7.4	1.8	24.1	3,353	12.5	2.3	18.7
Mexico	121,712	6.3	1.0	16.6	139,125	10.2	1.9	18.7
Peru	33,551	6.4	1.2	18.3	39,253	9.9	1.9	19.0
Uruguay	3,730	13.5	3.8	28.2	4,109	15.5	4.4	28.1
Africa								
Egypt	85,219	5.1	0.6	11.9	99,583	8.0	1.1	14.2
Kenya	33,612	3.8	0.6	16.6	34,836	5.2	1.1	20.7
Liberia	4,655	4.0	0.8	21.1	6,745	4.2	1.0	24.9
Malawi	12,017	3.1	0.4	12.7	12,817	3.2	0.6	17.5
Morocco	37,832	5.5	1.0	17.4	44,664	9.1	1.4	15.2
Tunisia	11,174	7.6	1.5	19.8	12,322	12.7	2.3	17.7
Zimbabwe	10,548	5.0	1.0	20.2	9,086	6.4	1.8	27.7

Source: United Nations, 1999 and U.S. Census Bureau, 2000a.

Table 2.
Population by Age: 2000 and 2030

(In thousands)

Country	2000							
	All ages	0 to 24 years	25 to 54 years	55 to 64 years	65 to 69 years	70 to 74 years	75 to 79 years	80 years and over
United States	275,563	97,064	119,662	24,001	9,436	8,753	7,422	9,225
Western Europe								
Austria	8,131	2,325	3,629	926	347	332	294	278
Belgium	10,242	3,033	4,432	1,052	521	462	383	358
Denmark	5,336	1,594	2,340	610	219	194	167	212
France	59,330	18,852	25,513	5,471	2,711	2,466	2,100	2,216
Germany	82,797	22,309	36,224	10,813	4,104	3,592	2,846	2,911
Greece.....	10,602	3,088	4,480	1,195	605	521	341	371
Italy.....	57,634	14,873	25,640	6,696	3,093	2,766	2,253	2,313
Luxembourg	437	133	199	44	19	17	12	13
Norway	4,481	1,435	1,937	426	167	164	156	196
Sweden	8,873	2,655	3,674	1,010	380	363	343	447
United Kingdom	59,508	18,549	25,496	6,138	2,585	2,347	2,018	2,373
Eastern Europe								
Bulgaria	7,797	2,354	3,255	902	453	382	282	169
Czech Republic	10,272	3,250	4,505	1,093	448	409	323	244
Hungary	10,139	3,207	4,336	1,113	479	420	326	257
Poland	38,646	13,915	16,676	3,319	1,616	1,372	953	794
Russia	146,001	49,232	64,197	14,160	5,996	6,182	3,299	2,936
Ukraine	49,153	16,052	20,607	5,647	2,080	2,294	1,377	1,096
North America/Oceania								
Australia	19,165	6,629	8,427	1,727	668	633	509	573
Canada	31,278	10,154	14,322	2,838	1,147	1,012	822	984
New Zealand	3,820	1,417	1,637	324	124	116	91	110
Asia								
Bangladesh.....	129,194	76,298	42,947	5,645	1,744	1,206	710	643
China	1,261,832	515,155	572,082	86,822	34,926	25,426	15,908	11,513
India	1,014,004	536,947	373,956	56,037	18,477	13,785	8,627	6,175
Indonesia.....	224,784	113,419	88,231	13,080	4,616	2,872	1,559	1,006
Israel	5,842	2,617	2,257	391	168	152	120	138
Japan	126,550	34,782	53,858	16,385	7,031	5,812	4,012	4,670
Malaysia	21,793	11,583	8,175	1,152	353	260	151	119
Pakistan.....	141,554	86,109	43,165	6,485	2,317	1,637	1,071	770
Philippines.....	81,160	46,410	28,087	3,717	1,220	820	504	401
Singapore	4,152	1,333	2,281	253	98	76	49	61
South Korea	47,471	18,091	22,191	3,875	1,365	895	594	460
Sri Lanka	19,239	8,759	7,933	1,295	455	358	244	195
Thailand.....	61,231	25,879	27,045	4,386	1,591	1,086	699	545
Turkey	65,667	32,182	25,619	3,935	1,514	1,099	721	597
Latin America/Caribbean								
Argentina.....	36,955	16,326	13,856	2,946	1,209	1,026	761	831
Brazil	172,860	84,691	68,842	10,136	3,501	2,594	1,693	1,403
Chile	15,154	6,733	6,194	1,133	391	310	210	184
Colombia	39,686	19,897	15,867	2,071	742	546	338	225
Costa Rica	3,711	1,888	1,438	193	70	53	35	34
Guatemala	12,640	7,922	3,765	496	184	132	79	62
Jamaica.....	2,653	1,312	1,027	135	56	48	36	39
Mexico	100,350	54,699	36,241	5,092	1,722	1,197	757	642
Peru	27,013	14,735	9,606	1,409	500	351	223	189
Uruguay.....	3,334	1,348	1,257	298	138	118	84	91
Africa								
Egypt	68,360	37,706	24,572	3,509	1,162	748	401	261
Kenya.....	30,340	20,064	8,423	1,021	340	237	146	108
Liberia	3,164	1,985	929	141	43	29	19	18
Malawi	10,386	6,955	2,757	385	126	85	49	28
Morocco.....	30,122	16,826	10,472	1,434	538	393	262	197
Tunisia	9,593	4,834	3,638	542	223	173	106	77
Zimbabwe	11,343	7,281	3,238	422	156	112	74	59

Table 2.
Population by Age: 2000 and 2030—Con.

(In thousands)

Country	2030							
	All ages	0 to 24 years	25 to 54 years	55 to 64 years	65 to 69 years	70 to 74 years	75 to 79 years	80 years and over
United States	351,326	115,218	128,484	37,305	19,844	17,878	14,029	18,569
Western Europe								
Austria	8,278	1,916	3,034	1,244	636	500	367	582
Belgium	10,175	2,553	3,683	1,357	709	628	501	744
Denmark	5,649	1,515	2,076	760	357	295	246	400
France	61,926	16,405	22,599	8,073	3,775	3,435	3,005	4,635
Germany	84,939	20,074	31,104	11,886	6,502	5,192	4,036	6,145
Greece	10,316	2,287	3,814	1,594	692	620	503	807
Italy	52,868	10,165	18,788	9,033	4,115	3,307	2,685	4,775
Luxembourg	580	164	229	72	35	29	22	30
Norway	5,018	1,405	1,856	653	295	261	217	331
Sweden	8,868	2,210	3,267	1,167	555	482	424	763
United Kingdom	61,481	16,077	22,663	8,296	4,215	3,336	2,598	4,296
Eastern Europe								
Bulgaria	5,668	1,096	2,240	866	381	362	315	408
Czech Republic	9,409	1,933	3,718	1,436	583	532	512	696
Hungary	9,034	2,012	3,662	1,330	485	506	472	566
Poland	37,377	9,260	15,184	4,642	2,087	2,267	1,882	2,056
Russia	132,859	35,650	53,589	16,428	8,288	7,776	5,681	5,446
Ukraine	42,273	11,383	17,099	5,479	2,553	2,292	1,683	1,783
North America/Oceania								
Australia	23,497	6,643	8,941	2,960	1,356	1,212	975	1,410
Canada	39,128	10,368	14,987	4,800	2,581	2,249	1,728	2,414
New Zealand	4,768	1,400	1,914	607	233	209	166	238
Asia								
Bangladesh	184,478	71,167	84,043	16,060	5,248	3,821	2,356	1,783
China	1,483,121	437,787	588,812	219,501	84,958	59,230	49,367	43,466
India	1,437,103	558,161	614,683	135,423	49,013	35,886	23,744	20,194
Indonesia	312,592	112,472	132,916	33,067	12,612	9,740	6,450	5,335
Israel	7,873	2,724	3,154	825	327	288	246	310
Japan	116,740	25,589	40,441	17,661	7,094	6,391	6,562	13,002
Malaysia	35,306	15,017	13,891	3,063	1,236	919	617	563
Pakistan	226,251	95,929	98,625	17,008	5,826	4,186	2,568	2,109
Philippines	129,448	55,474	53,369	10,581	3,738	2,814	1,877	1,596
Singapore	9,047	2,345	4,158	1,204	468	360	239	274
South Korea	53,763	14,515	20,967	7,819	3,470	2,959	1,803	2,231
Sri Lanka	22,937	7,102	9,580	2,771	1,142	945	694	703
Thailand	71,311	21,219	28,987	9,441	3,927	3,189	2,303	2,245
Turkey	84,195	26,295	36,793	10,231	3,940	2,899	2,002	2,036
Latin America/Caribbean								
Argentina	47,229	16,082	19,374	4,834	1,963	1,705	1,376	1,895
Brazil	203,489	66,334	87,458	22,898	9,091	7,080	5,099	5,530
Chile	18,915	5,863	7,817	2,133	1,006	823	582	691
Colombia	57,666	21,940	23,069	6,034	2,481	1,872	1,217	1,053
Costa Rica	5,272	1,796	2,248	554	235	188	124	127
Guatemala	24,038	12,128	9,105	1,455	493	368	252	238
Jamaica	3,353	1,062	1,447	425	158	110	73	78
Mexico	139,125	52,128	58,225	14,646	5,165	3,700	2,621	2,639
Peru	39,253	14,952	16,694	3,735	1,394	1,031	711	736
Uruguay	4,109	1,444	1,593	434	183	156	119	179
Africa								
Egypt	99,583	38,878	43,516	9,212	3,144	2,261	1,437	1,136
Kenya	34,836	15,729	15,402	1,902	610	472	349	373
Liberia	6,745	3,958	2,213	292	92	69	50	70
Malawi	12,817	6,856	5,087	466	144	111	81	71
Morocco	44,664	17,220	19,141	4,225	1,546	1,180	735	618
Tunisia	12,322	3,806	5,428	1,517	581	442	270	278
Zimbabwe	9,086	4,622	3,566	317	146	147	127	161

Source: U.S. Census Bureau, 2000a.

Table 3.
**Average Annual Growth Rate and Percent Change Over Time for Older Age Groups:
 2000 to 2015 and 2015 to 2030**

(In percent)

Country	Average annual growth rate							
	2000 to 2015				2015 to 2030			
	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
United States	2.5	1.4	1.3	1.4	-0.5	2.8	3.0	2.8
Western Europe								
Austria	0.8	0.9	1.9	1.1	0.9	1.7	2.3	1.9
Belgium	1.5	0.2	2.5	0.8	-0.3	1.7	1.6	1.7
Denmark	0.7	1.6	0.7	1.4	0.6	0.8	3.3	1.5
France	1.9	0.5	2.4	1.0	0.1	1.7	1.7	1.7
Germany	0.3	0.9	2.3	1.2	0.2	1.5	2.0	1.6
Greece	0.7	0.2	3.0	0.9	0.9	1.1	1.2	1.1
Italy	0.5	0.4	2.5	0.9	1.3	1.0	1.5	1.1
Luxembourg	1.8	0.9	2.5	1.3	0.9	2.6	2.2	2.5
Norway	1.7	1.1	0.5	1.0	0.6	1.6	2.8	1.9
Sweden	0.5	1.2	0.6	1.1	0.3	0.3	2.7	1.0
United Kingdom	1.0	0.9	1.2	0.9	0.7	1.4	2.4	1.7
Eastern Europe								
Bulgaria	0.2	-0.4	3.0	0.2	-0.6	0.1	1.8	0.6
Czech Republic	1.2	1.1	2.8	1.4	0.2	0.7	3.3	1.4
Hungary	1.0	0.3	2.3	0.7	-0.1	0.8	2.1	1.2
Poland	2.6	0.5	3.0	1.0	-1.3	2.4	2.3	2.4
Russia	1.8	-0.2	2.0	0.3	-1.4	2.5	1.4	2.2
Ukraine	0.3	-0.4	1.3	-0.1	-0.6	1.3	1.5	1.4
North America/Oceania								
Australia	2.2	1.7	2.2	1.8	0.7	2.2	3.1	2.5
Canada	2.7	1.7	2.2	1.9	-0.1	3.0	3.0	3.0
New Zealand	1.9	1.5	1.7	1.6	1.6	2.1	2.9	2.3
Asia								
Bangladesh	2.8	2.6	1.6	2.5	3.2	4.1	4.7	4.2
China	2.8	1.8	3.6	2.1	2.5	3.8	4.0	3.9
India	2.5	2.2	2.7	2.2	2.6	3.6	4.3	3.7
Indonesia	2.9	2.3	5.3	2.7	2.3	4.7	4.1	4.6
Israel	2.7	1.3	2.0	1.5	1.3	2.7	2.7	2.7
Japan	-0.2	1.5	3.2	1.9	0.7	-0.8	2.6	0.3
Malaysia	3.1	3.2	3.5	3.2	2.4	4.3	5.7	4.5
Pakistan	2.2	1.8	2.5	1.9	3.5	3.8	3.4	3.7
Philippines	3.0	2.7	3.1	2.8	3.0	4.3	5.0	4.4
Singapore	5.2	3.4	4.2	3.6	3.5	5.9	4.5	5.6
South Korea	2.5	2.5	4.5	2.9	1.4	3.7	4.5	3.8
Sri Lanka	2.6	2.3	3.1	2.5	1.7	3.3	4.4	3.5
Thailand	2.6	2.4	3.9	2.6	1.7	3.6	4.2	3.7
Turkey	2.5	1.9	3.5	2.2	3.0	4.0	3.4	3.9
Latin America/Caribbean								
Argentina	1.6	1.1	2.3	1.4	1.2	2.0	2.4	2.1
Brazil	2.5	2.4	3.6	2.6	2.1	3.5	4.3	3.6
Chile	2.3	2.5	3.3	2.6	1.1	3.2	4.4	3.4
Colombia	3.4	2.5	4.0	2.7	2.6	4.8	4.9	4.8
Costa Rica	3.6	2.7	3.1	2.8	2.3	4.7	4.6	4.7
Guatemala	2.9	2.1	3.8	2.4	3.4	4.0	4.0	4.0
Jamaica	2.8	0.9	1.6	1.1	4.0	4.7	2.5	4.2
Mexico	2.6	2.8	3.4	2.9	3.6	3.9	4.8	4.1
Peru	2.6	2.5	3.7	2.7	3.1	3.8	4.2	3.9
Uruguay	0.9	0.3	2.2	0.8	1.3	1.6	1.6	1.6
Africa								
Egypt	2.6	2.5	3.4	2.6	2.9	3.9	5.2	4.0
Kenya	1.2	1.9	3.4	2.1	2.6	2.0	3.8	2.3
Liberia	1.5	2.4	3.8	2.7	2.9	2.5	3.9	2.8
Malawi	-	1.1	2.5	1.3	1.3	0.3	2.8	0.6
Morocco	3.0	1.8	3.0	2.0	3.3	4.7	3.6	4.5
Tunisia	2.6	1.5	3.9	1.9	3.4	4.3	3.3	4.1
Zimbabwe	-0.2	1.1	3.0	1.4	-1.6	-	2.7	0.6

Table 3.
**Average Annual Growth Rate and Percent Change Over Time for Older Age Groups:
 2000 to 2015 and 2015 to 2030—Con.**

(In percent)

Country	Percent change							
	2000 to 2015				2015 to 2030			
	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
United States	66	33	29	32	-7	52	56	53
Western Europe								
Austria	17	19	48	25	15	30	42	33
Belgium	34	4	64	16	-4	30	27	29
Denmark	14	37	16	32	9	13	63	24
France	45	10	61	22	1	28	30	29
Germany	6	20	57	28	3	25	34	27
Greece	16	5	81	20	15	18	20	19
Italy	10	8	65	20	22	16	25	18
Luxembourg	45	19	65	29	14	47	40	45
Norway	39	26	11	22	10	26	52	33
Sweden	10	28	14	24	5	5	50	17
United Kingdom	22	19	27	21	11	23	42	28
Eastern Europe								
Bulgaria	5	-7	83	5	-8	2	32	9
Czech Republic	27	25	73	33	4	11	65	23
Hungary	22	5	60	15	-2	14	38	19
Poland	69	10	83	22	-17	44	42	43
Russia	43	-3	50	5	-19	45	23	40
Ukraine	6	-7	30	-1	-8	22	25	23
North America/Oceania								
Australia	55	40	55	44	11	40	59	45
Canada	71	41	56	45	-1	56	57	56
New Zealand	47	35	40	36	27	36	54	41
Asia								
Bangladesh	76	69	37	64	62	85	102	87
China	75	43	107	51	45	78	82	78
India	64	54	73	57	47	72	89	75
Indonesia	79	58	188	71	41	102	84	99
Israel	72	29	49	34	22	51	50	51
Japan	-3	34	89	46	11	-11	47	5
Malaysia	84	89	102	91	44	92	134	98
Pakistan	55	42	64	45	70	76	67	75
Philippines	82	73	87	75	57	92	112	95
Singapore	182	97	130	104	68	143	96	131
South Korea	64	66	148	78	23	73	96	78
Sri Lanka	67	59	86	64	29	65	94	70
Thailand	67	62	120	70	29	73	87	75
Turkey	66	46	103	55	57	81	68	79
Latin America/Caribbean								
Argentina	36	25	59	32	20	35	44	37
Brazil	64	62	107	69	38	68	90	72
Chile	59	64	95	70	19	61	93	67
Colombia	99	66	123	73	47	106	110	107
Costa Rica	105	71	87	74	40	103	98	102
Guatemala	77	54	113	62	65	83	81	83
Jamaica	74	20	39	24	81	102	46	88
Mexico	68	74	99	78	72	80	107	84
Peru	67	64	108	71	58	78	87	80
Uruguay	20	6	55	16	21	27	26	27
Africa								
Egypt	70	66	99	69	55	78	118	83
Kenya	27	47	96	53	47	35	76	42
Liberia	35	62	116	71	54	45	79	52
Malawi	-1	25	65	29	22	4	51	10
Morocco	80	43	83	49	63	103	72	97
Tunisia	68	36	120	47	66	90	65	85
Zimbabwe	-4	24	81	32	-22	-1	50	10

Source: U.S. Census Bureau, 2000a.

Table 4.
Median Population Age: 2000, 2015, and 2030

Country	2000	2015	2030
United States	36	38	39
Western Europe			
Austria	38	44	47
Belgium	39	43	46
Denmark	38	42	43
France	38	42	44
Germany	40	45	47
Greece	39	44	49
Italy	40	46	52
Luxembourg	38	40	41
Norway	37	41	42
Sweden	39	43	45
United Kingdom	38	42	44
Eastern Europe			
Bulgaria	40	44	50
Czech Republic	38	43	49
Hungary	38	42	47
Poland	35	39	46
Russia	37	39	44
Ukraine	37	39	44
North America/Oceania			
Australia	35	39	42
Canada	37	41	44
New Zealand	32	37	40
Asia			
Bangladesh	20	27	33
China	30	36	41
India	23	28	32
Indonesia	25	30	34
Israel	28	32	36
Japan	41	45	50
Malaysia	23	26	30
Pakistan	19	24	29
Philippines	21	25	29
Singapore	34	38	41
South Korea	31	38	43
Sri Lanka	28	33	39
Thailand	29	35	40
Turkey	26	32	38
Latin America/Caribbean			
Argentina	29	32	36
Brazil	26	31	37
Chile	29	33	39
Colombia	25	29	33
Costa Rica	25	30	36
Guatemala	18	21	25
Jamaica	25	31	38
Mexico	23	28	34
Peru	23	27	33
Uruguay	31	34	36
Africa			
Egypt	22	27	32
Kenya	18	23	28
Liberia	18	18	20
Malawi	17	20	23
Morocco	22	27	33
Tunisia	25	32	39
Zimbabwe	19	22	25

Source: U.S. Census Bureau, 2000a.

Table 5.
Total and Elderly Urban Population by Sex: Available Data From 1970 to the Present

Country	Year	Males			Females			Elderly sex ratio
		All ages	Elderly	Percent elderly	All ages	Elderly	Percent elderly	
United States	1970	71,958,564	5,859,472	8.1	77,366,366	8,771,643	11.3	67
	1980	80,287,243	7,327,774	9.1	86,767,395	11,672,992	13.5	63
	1990	90,386,114	9,179,593	10.2	96,667,373	14,388,961	14.9	64
Western Europe								
Austria	1971	1,762,775	223,701	12.7	2,103,790	403,229	19.2	55
	1981	1,919,638	244,735	12.7	2,241,407	463,164	20.7	53
	1991	2,386,002	272,021	11.4	2,646,187	533,663	20.2	51
Denmark	1970	1,922,558	206,818	10.8	2,023,599	290,237	14.3	71
	1981	2,089,529	251,479	12.0	2,207,563	376,266	17.0	67
France	1975	18,658,540	1,858,540	10.0	19,728,800	3,054,920	15.5	61
	1982	19,239,340	1,912,080	9.9	20,560,480	3,204,660	15.6	60
	1990	20,194,431	2,236,685	11.1	21,728,802	3,625,554	16.7	62
Greece	1971	2,781,700	239,820	8.6	2,904,040	317,300	10.9	76
	1981	3,311,565	316,153	9.5	3,478,383	413,686	11.9	76
	1991	2,914,404	301,833	10.4	3,124,577	412,831	13.2	73
Norway	1970	1,241,873	122,137	9.8	1,313,040	182,976	13.9	67
	1980	1,409,663	133,166	9.4	1,483,530	211,705	14.3	63
	1990	1,488,678	188,455	12.7	1,567,516	287,279	18.3	66
Sweden	1970	3,232,096	342,732	10.6	3,342,837	474,392	14.2	72
	1975	3,327,513	403,825	12.1	3,461,919	564,329	16.3	72
	1980	3,378,530	452,876	13.4	3,534,963	642,174	18.2	71
	1990	3,494,512	517,841	14.8	3,670,257	753,536	20.5	69
Eastern Europe								
Bulgaria	1975	2,517,816	174,000	6.9	2,543,653	218,000	8.6	80
	1987	2,923,029	221,049	7.6	2,998,215	281,896	9.4	78
	1994	2,789,501	277,493	9.9	2,926,403	360,531	12.3	77
	1996	2,741,483	272,800	10.0	2,893,119	364,313	12.6	75
Czech Republic	1994	3,731,186	365,443	9.8	3,989,275	602,153	15.1	61
	1996	3,719,889	378,763	10.2	3,974,872	618,011	15.5	61
Hungary	1970	2,217,658	205,423	9.3	2,449,193	326,340	13.3	63
	1980	2,733,600	283,600	10.4	2,968,000	447,900	15.1	63
	1988	3,000,826	289,051	9.6	3,284,713	486,970	14.8	59
	1995	3,038,844	328,028	10.8	3,401,226	551,982	16.2	59
	1996	3,037,842	331,902	10.9	3,405,105	559,268	16.4	59
Poland	1970	8,167,184	464,200	5.7	8,887,220	847,900	9.5	55
	1978	9,667,100	660,000	6.8	10,472,600	1,171,000	11.2	56
	1988	11,120,389	716,691	6.4	12,054,337	1,286,368	10.7	56
	1994	11,422,337	847,910	7.4	12,435,702	1,476,495	11.9	57
	1996	11,429,857	916,922	8.0	12,466,966	1,560,339	12.5	59
Russia	1970	36,930,897	1,432,200	3.9	43,700,474	3,909,327	8.9	37
	1979	43,754,734	2,300,003	5.3	51,187,562	5,966,210	11.7	39
	1989	50,332,668	2,566,076	5.1	57,626,334	6,960,412	12.1	37
	1995	50,405,185	3,684,024	7.3	57,373,948	8,329,645	14.5	44
Ukraine	1970	11,823,177	586,310	5.0	13,722,473	1,248,423	9.1	47
	1979	13,953,878	887,799	6.4	16,215,059	1,897,668	11.7	47
	1989	15,981,442	972,137	6.1	18,315,789	2,222,828	12.1	44
	1995	16,298,622	1,292,193	7.9	18,529,728	2,602,852	14.0	50
North America/Oceania								
Australia	1971	5,424,345	379,844	7.0	5,489,106	557,526	10.2	68
	1976	5,768,584	436,202	7.6	5,881,892	636,732	10.8	69
	1986	6,567,861	605,540	9.2	6,749,084	867,372	12.9	70
Canada	1971	8,104,535	557,750	6.9	8,306,250	762,300	9.2	73
	1976	8,528,975	635,970	7.5	8,838,000	905,065	10.2	70
	1981	9,013,665	746,085	8.3	9,422,265	1,096,860	11.6	68
	1991	10,175,040	1,002,465	9.9	10,731,835	1,500,100	14.0	67

Table 5.
Total and Elderly Urban Population by Sex: Available Data From 1970 to the Present—Con.

Country	Year	Males			Females			Elderly sex ratio
		All ages	Elderly	Percent elderly	All ages	Elderly	Percent elderly	
New Zealand	1981	1,299,006	115,065	8.9	1,351,878	165,414	12.2	70
	1991	1,395,495	140,316	10.1	1,471,236	200,823	13.6	70
Africa								
Egypt	1976	8,539,623	265,355	3.1	8,018,049	247,043	3.1	107
	1986	10,908,850	444,257	4.1	10,306,654	358,645	3.5	124
Kenya	1979	1,307,158	21,142	1.6	1,075,045	18,128	1.7	117
	1989	1,933,437	23,090	1.2	1,606,451	21,877	1.4	106
Malawi	1977	253,545	3,842	1.5	217,113	3,203	1.5	120
	1987	445,863	7,085	1.6	407,527	6,479	1.6	109
Morocco	1971	2,627,918	94,678	3.6	2,740,046	103,436	3.8	92
	1982	4,378,706	138,248	3.2	4,354,801	140,753	3.2	98
Tunisia	1975	1,401,510	50,650	3.6	1,377,670	46,990	3.4	108
	1984	1,869,010	83,920	4.5	1,816,460	75,490	4.2	111
	1994	2,717,168	137,874	5.1	2,644,759	138,586	5.2	99
Zimbabwe	1982	940,620	28,540	3.0	825,130	16,290	2.0	175
	1992	1,636,352	32,614	2.0	1,551,368	28,651	1.8	114
Asia								
Bangladesh	1974	3,538,531	84,854	2.4	2,734,781	63,247	2.3	134
	1981	7,370,000	226,000	3.1	5,858,000	157,000	2.7	144
	1988	8,163,604	212,600	2.6	6,918,309	131,859	1.9	161
	1991	11,301,085	305,677	2.7	9,571,119	222,943	2.3	137
China	1982	107,915,090	4,183,470	3.9	98,332,070	5,186,590	5.3	81
	1990	157,491,587	7,081,751	4.5	142,665,833	8,260,440	5.8	86
India	1971	58,718,371	1,526,269	2.6	50,378,274	1,494,668	3.0	102
	1981	83,876,401	2,486,231	3.0	73,803,766	2,545,642	3.4	98
Indonesia	1971	10,194,359	196,839	1.9	10,255,961	245,422	2.4	80
	1980	16,439,900	374,916	2.3	16,401,825	489,857	3.0	77
	1990	27,683,319	800,720	2.9	27,750,471	981,431	3.5	82
Israel	1972	1,343,341	100,705	7.5	1,341,228	104,050	7.8	97
	1983	1,793,397	156,353	8.7	1,822,632	177,579	9.7	88
	1994	2,390,900	205,500	8.6	2,453,000	271,200	11.1	76
	1995	2,452,000	211,000	8.6	2,518,500	281,200	11.2	75
	Japan	1970	36,889,500	2,044,900	5.5	37,799,200	2,612,500	6.9
1975	41,988,960	2,579,504	6.1	42,933,417	3,387,121	7.9	76	
1980	43,979,403	3,094,757	7.0	45,138,389	4,218,737	9.3	73	
1985	45,766,358	3,559,634	7.8	47,082,519	5,138,386	10.9	69	
1990	47,124,420	4,224,745	9.0	48,519,101	6,279,911	12.9	67	
1995	48,210,196	5,385,903	11.2	49,798,911	7,693,917	15.4	70	
Malaysia	1970	1,402,000	40,628	2.9	1,378,254	45,916	3.3	88
	1980	2,044,873	69,340	3.4	2,028,232	79,699	3.9	87
	1991	4,472,970	133,071	3.0	4,425,611	167,315	3.8	80
Pakistan	1972	9,019,171	289,765	3.2	7,561,180	213,461	2.8	136
	1981	12,767,061	446,804	3.5	11,074,410	327,383	3.0	136
	1990	14,514,629	433,128	3.0	13,542,746	383,029	2.8	113
Philippines	1970	5,670,816	149,101	2.6	5,999,388	170,339	2.8	88
	1975	6,553,324	182,848	2.8	6,752,757	198,287	2.9	92
	1980	8,765,413	244,103	2.8	9,178,240	341,658	3.7	71
	1990	14,546,463	415,222	2.9	14,893,690	537,747	3.6	77
Singapore	1970	1,062,127	30,589	2.9	1,012,380	38,775	3.8	79
	1980	1,231,760	51,202	4.2	1,182,185	62,722	5.3	82
	1990	1,517,776	75,403	5.0	1,498,603	93,266	6.2	81
South Korea	1975	8,369,909	128,569	1.5	8,400,037	253,528	3.0	51
	1980	10,697,843	183,694	1.7	10,711,606	365,207	3.4	50
	1985	13,154,130	271,087	2.1	13,263,842	521,815	3.9	52
	1995	17,595,723	536,398	3.0	17,396,241	978,119	5.6	55

Table 5.
Total and Elderly Urban Population by Sex: Available Data From 1970 to the Present—Con.

Country	Year	Males			Females			Elderly sex ratio
		All ages	Elderly	Percent elderly	All ages	Elderly	Percent elderly	
Sri Lanka	1971	1,513,102	58,346	3.9	1,335,014	56,084	4.2	104
	1981	1,665,539	68,979	4.1	1,528,940	72,270	4.7	95
Thailand	1970	2,257,068	55,778	2.5	2,296,032	79,328	3.5	70
	1980	3,744,425	109,059	2.9	3,888,491	147,891	3.8	74
	1990	4,941,000	173,200	3.5	5,265,900	230,700	4.4	75
Turkey	1980	10,272,130	345,047	3.4	9,372,877	457,407	4.9	75
	1985	14,010,670	399,207	2.8	12,855,087	532,949	4.1	75
	1990	17,247,553	518,630	3.0	16,078,798	675,302	4.2	77
Latin America/Caribbean								
Argentina	1980	11,213,938	820,687	7.3	11,978,954	1,159,370	9.7	71
	1995	14,820,662	1,185,585	8.0	15,736,243	1,761,004	11.2	67
Brazil	1970	25,173,439	803,470	3.2	26,801,506	1,010,184	3.8	80
	1980	39,192,230	1,447,919	3.7	41,172,542	1,864,900	4.5	78
	1991	53,854,256	2,333,327	4.3	57,136,734	3,082,663	5.4	76
Chile	1970	3,173,323	139,527	4.4	3,501,814	193,934	5.5	72
	1982	4,464,374	219,108	4.9	4,851,754	313,023	6.5	70
	1992	5,364,760	288,375	5.4	5,775,645	427,059	7.4	68
	1997	6,052,039	324,862	5.4	6,368,467	503,897	7.9	64
Colombia	1973	5,904,613	172,482	2.9	6,703,236	232,676	3.5	74
	1985	8,927,542	321,963	3.6	9,786,011	407,186	4.2	79
	1993	11,211,708	472,784	4.2	12,302,362	593,057	4.8	80
Costa Rica	1973	360,701	14,033	3.9	399,378	18,497	4.6	76
	1984	514,426	24,261	4.7	560,828	32,416	5.8	75
	1995	674,634	53,926	8.0	694,787	69,823	10.0	77
Guatemala	1973	905,685	29,216	3.2	972,506	36,717	3.8	80
	1981	949,676	35,220	3.7	1,030,857	42,529	4.1	83
Jamaica	1982	494,155	23,230	4.7	551,886	33,216	6.0	70
	1991	543,108	27,635	5.1	605,083	39,724	6.6	70
Mexico	1970	13,882,914	463,048	3.3	14,425,642	580,730	4.0	80
	1995	32,720,158	1,277,431	3.9	34,283,357	1,570,619	4.6	81
Peru	1972	4,028,169	125,390	3.1	4,030,326	154,174	3.8	81
	1981	5,517,769	193,224	3.5	5,574,154	225,243	4.0	86
	1993	7,606,489	324,827	4.3	7,852,110	372,285	4.7	87
Uruguay	1975	1,099,634	99,670	9.1	1,214,722	138,060	11.4	72
	1985	1,222,260	119,891	9.8	1,358,827	177,647	13.1	67
	1990	1,306,601	130,547	10.0	1,441,721	194,640	13.5	67
	1996	1,366,092	148,110	10.8	1,505,985	225,783	15.0	66

Notes: "Urban" refers to localities defined as such by each country. Individual national definitions are available in the annotations to respective International Data Base tables.

"Elderly Sex Ratio" is defined as the number of men aged 65 years and over per 100 women aged 65 years and over.

Source: U.S. Census Bureau, 2000a.

Table 6.
Sex Ratio for Population 25 Years and Over by Age: 2000 and 2030

(Men per 100 women)

Country	2000						2030					
	25 to 54 years	55 to 64 years	65 to 69 years	70 to 74 years	75 to 79 years	80 years and over	25 to 54 years	55 to 64 years	65 to 69 years	70 to 74 years	75 to 79 years	80 years and over
United States.....	98	91	85	79	72	52	98	92	89	86	81	64
Western Europe												
Austria.....	103	95	85	72	50	38	104	99	96	89	79	58
Belgium.....	102	96	87	78	66	41	102	98	93	87	80	57
Denmark.....	103	99	90	82	70	49	102	98	96	90	82	62
France.....	100	96	85	77	66	46	103	96	88	82	76	57
Germany.....	105	98	89	73	49	35	102	98	94	87	77	56
Greece.....	100	94	89	83	75	67	105	98	91	87	82	65
Italy.....	100	92	85	77	66	50	102	96	91	86	77	58
Luxembourg.....	102	99	88	78	53	42	98	94	92	86	79	59
Norway.....	104	99	91	83	70	50	100	97	95	90	82	62
Sweden.....	104	101	91	83	75	54	104	99	96	91	83	64
United Kingdom.....	102	97	91	82	70	45	105	101	96	90	81	60
Eastern Europe												
Bulgaria.....	97	87	82	75	67	62	102	89	79	72	63	48
Czech Republic.....	101	90	78	67	55	42	103	97	89	81	71	53
Hungary.....	98	80	70	62	53	43	102	92	80	70	61	42
Poland.....	100	85	75	65	54	44	102	94	84	76	66	49
Russia.....	96	73	62	51	33	26	97	84	72	62	52	39
Ukraine.....	93	73	66	54	37	29	97	80	67	58	49	34
North America/Oceania												
Australia.....	102	101	94	88	75	55	102	98	93	87	80	66
Canada.....	101	97	92	83	71	52	102	97	93	87	79	61
New Zealand.....	101	97	95	89	74	53	103	101	92	86	79	62
Asia												
Bangladesh.....	104	116	115	118	126	128	104	101	97	96	100	105
China.....	106	108	101	93	80	59	107	100	95	90	80	63
India.....	106	108	103	100	106	106	107	99	90	92	92	89
Indonesia.....	100	89	83	79	74	64	101	95	90	85	78	59
Israel.....	101	91	84	74	72	70	104	101	96	87	80	66
Japan.....	102	95	89	83	64	48	104	100	94	88	81	61
Malaysia.....	99	96	84	80	71	64	104	97	86	76	71	61
Pakistan.....	104	98	98	97	95	96	105	102	95	87	78	70
Philippines.....	96	91	85	79	76	77	102	92	83	74	67	61
Singapore.....	94	100	88	83	76	59	85	84	86	86	81	64
South Korea.....	103	94	76	62	55	40	108	97	88	82	75	56
Sri Lanka.....	93	90	92	93	93	94	96	86	78	72	68	63
Thailand.....	96	91	85	82	75	59	102	90	82	77	71	56
Turkey.....	105	96	93	91	84	62	102	101	98	91	83	63
Latin America/Caribbean												
Argentina.....	100	92	82	74	66	56	102	95	89	83	75	58
Brazil.....	96	85	78	70	63	50	98	88	80	74	67	52
Chile.....	99	91	83	76	68	46	102	96	90	85	76	55
Colombia.....	94	82	85	83	80	72	97	89	84	79	70	53
Costa Rica.....	101	100	95	91	84	71	104	99	91	86	81	67
Guatemala.....	98	94	93	91	83	75	101	94	89	84	76	67
Jamaica.....	98	93	89	85	78	68	104	99	90	79	75	65
Mexico.....	92	89	87	84	77	65	98	89	79	73	68	57
Peru.....	101	97	93	87	80	68	101	97	93	89	82	68
Uruguay.....	97	87	82	75	68	53	103	96	86	78	72	52
Africa												
Egypt.....	102	91	85	79	70	64	102	100	85	78	69	53
Kenya.....	101	85	78	80	80	77	108	88	73	66	61	56
Liberia.....	90	109	109	103	92	87	98	85	77	76	79	87
Malawi.....	96	73	70	69	69	68	111	81	57	47	41	37
Morocco.....	98	84	83	86	84	81	101	94	88	84	75	58
Tunisia.....	99	89	95	99	105	117	104	98	92	87	79	69
Zimbabwe.....	101	97	105	108	104	90	130	105	70	55	52	56

Source: U.S. Census Bureau, 2000a.

Table 7.
Marital Status of Older Persons by Sex: Selected Years 1970 to 1995

Country, year, and age	Males						Females					
	Total	Single	Married	Widowed	Separated/ divorced	Percent widowed	Total	Single	Married	Widowed	Separated/ divorced	Percent widowed
United States												
1977												
55 to 64	9,476,000	549,000	8,109,000	323,000	495,000	3.4	10,601,000	492,000	7,434,000	2,023,000	652,000	19.1
65 and over	9,132,000	539,000	7,007,000	1,298,000	288,000	14.2	12,968,000	831,000	5,029,000	6,750,000	358,000	52.1
75 and over	2,991,000	139,000	2,070,000	727,000	55,000	24.3	4,968,000	327,000	1,070,000	3,463,000	108,000	69.7
1987												
55 to 64	10,277,000	591,000	8,439,000	293,000	954,000	2.9	11,606,000	485,000	7,903,000	1,935,000	1,283,000	16.7
65 and over	11,576,000	526,000	8,806,000	1,622,000	622,000	14.0	16,396,000	898,000	6,565,000	8,070,000	863,000	49.2
75 and over	3,969,000	172,000	2,692,000	937,000	168,000	23.6	6,773,000	435,000	1,577,000	4,541,000	220,000	67.0
1990												
55 to 64	9,981,417	556,412	8,004,491	347,468	1,073,046	3.5	11,166,506	508,048	7,398,225	1,776,893	1,483,340	15.9
65 and over	12,565,173	618,893	9,398,672	1,781,502	766,106	14.2	18,676,658	1,025,944	7,218,018	9,225,990	1,206,706	49.4
75 and over	4,623,560	226,579	3,111,154	1,079,851	205,976	23.4	8,511,713	535,978	1,964,130	5,638,182	373,423	66.2
1995												
55 to 64	9,878,000	494,000	7,821,000	275,000	1,288,000	2.8	10,878,000	467,000	7,152,000	1,405,000	1,854,000	12.9
65 and over	13,002,000	543,000	9,693,000	1,755,000	1,011,000	13.5	18,262,000	768,000	7,421,000	8,636,000	1,437,000	47.3
75 and over	4,905,000	201,000	3,353,000	1,062,000	289,000	21.7	8,145,000	360,000	2,057,000	5,284,000	444,000	64.9
Western Europe												
Austria												
1975												
55 to 64	292,514	18,067	251,872	11,958	10,617	4.1	418,214	45,134	234,142	115,307	23,631	27.6
65 and over	419,222	27,803	303,413	76,226	11,780	18.2	712,408	89,807	198,134	398,481	25,986	55.9
75 and over	128,104	8,290	75,050	42,124	2,640	32.9	270,703	36,463	37,532	189,810	6,898	70.1
1982												
55 to 64	325,102	18,770	282,401	11,910	12,021	3.7	464,436	48,055	287,062	100,012	29,307	21.5
65 and over	398,381	25,044	288,932	72,426	11,979	18.2	717,382	83,309	189,290	414,188	30,595	57.7
75 and over	151,921	9,974	92,455	45,729	3,763	30.1	318,738	39,736	45,590	223,728	9,684	70.2
1991												
55 to 64	368,200	24,300	309,800	14,600	19,500	4.0	406,700	33,400	269,400	76,300	27,600	18.8
65 and over	404,400	21,500	303,400	66,100	13,400	16.3	762,500	78,900	229,900	414,900	38,800	54.4
80 and over	81,000	4,900	45,500	28,700	1,900	35.4	201,800	22,600	19,900	152,200	7,100	75.4
Belgium												
1970												
55 to 64	510,104	41,674	432,431	27,202	8,797	5.3	568,179	47,653	397,082	112,424	11,020	19.8
65 and over	531,595	36,822	367,496	121,407	5,870	22.8	764,113	76,475	289,108	388,803	9,727	50.9
75 and over	165,281	10,634	87,673	65,842	1,132	39.8	278,504	31,894	57,762	185,981	2,867	66.8

Table 7.
Marital Status of Older Persons by Sex: Selected Years 1970 to 1995—Con.

Country, year, and age	Males						Females					
	Total	Single	Married	Widowed	Separated/ divorced	Percent widowed	Total	Single	Married	Widowed	Separated/ divorced	Percent widowed
1981												
55 to 64	486,328	35,167	416,825	21,167	13,169	4.4	530,935	38,830	381,994	94,830	15,281	17.9
65 and over	559,796	40,172	394,288	115,149	10,187	20.6	855,497	76,668	311,478	450,087	17,264	52.6
75 and over	195,638	13,055	110,742	69,243	2,598	35.4	371,064	36,273	75,727	253,171	5,893	68.2
1995												
55 to 64	539,184	38,179	446,888	20,822	33,295	3.9	572,927	28,877	426,701	81,861	35,488	14.3
65 and over	639,393	41,420	473,136	104,998	19,839	16.4	957,152	70,016	378,210	477,307	31,619	49.9
75 and over	206,173	12,878	127,024	61,994	4,277	30.1	415,938	34,652	84,299	286,508	10,479	68.9
Denmark												
1970												
55 to 64	266,499	23,955	215,864	11,862	14,818	4.5	284,835	27,815	189,277	47,679	20,064	16.7
65 and over	267,785	21,551	181,551	55,457	9,226	20.7	342,456	47,998	124,958	154,680	14,820	45.2
75 and over	91,710	6,581	49,619	33,294	2,216	36.3	127,693	19,072	26,203	78,229	4,189	61.3
1984												
55 to 64	259,041	21,448	206,028	11,726	19,839	4.5	278,757	16,898	191,979	44,941	24,939	16.1
65 and over	317,829	24,953	220,280	56,838	15,758	17.9	443,742	44,903	160,494	209,959	28,386	47.3
75 and over	116,038	8,771	68,576	34,579	4,112	29.8	198,627	25,116	40,903	122,344	10,264	61.6
1988												
55 to 64	246,548	20,438	192,434	11,123	22,553	4.5	264,292	14,592	181,376	41,819	26,505	15.8
65 and over	327,558	25,010	225,922	58,379	18,247	17.8	463,443	40,978	167,399	222,770	32,296	48.1
75 and over	126,193	9,558	75,402	36,033	5,200	28.6	218,577	24,291	45,449	136,450	12,387	62.4
1991												
55 to 64	242,100	19,700	186,300	10,500	25,600	4.3	256,500	13,000	175,500	39,000	29,000	15.2
65 and over	330,700	24,900	226,200	59,300	20,300	17.9	471,200	37,700	169,600	229,000	34,900	48.6
80 and over	63,100	4,600	32,900	23,300	2,300	36.9	129,200	14,600	17,600	90,100	6,900	69.7
France												
1977												
55 to 64	2,133,608	185,516	1,796,121	91,896	60,075	4.3	2,389,708	194,106	1,623,560	477,261	94,781	20.0
65 and over	2,814,161	216,482	2,040,539	499,832	57,308	17.8	4,409,488	434,915	1,523,015	2,331,037	120,521	52.9
75 and over	916,605	59,680	565,618	278,799	12,508	30.4	1,897,529	203,787	345,672	1,308,857	39,213	69.0
1987												
55 to 64	2,829,063	264,794	2,347,412	104,386	112,471	3.7	3,117,299	235,945	2,182,303	542,687	156,364	17.4
65 and over	2,865,962	213,622	2,100,203	476,298	75,839	16.6	4,535,745	388,255	1,581,611	2,406,407	159,472	53.1
75 and over	1,216,803	87,804	775,866	326,761	26,372	26.9	2,375,929	220,211	495,629	1,591,504	68,585	67.0

Table 7.
Marital Status of Older Persons by Sex: Selected Years 1970 to 1995—Con.

Country, year, and age	Males						Females					
	Total	Single	Married	Widowed	Separated/ divorced	Percent widowed	Total	Single	Married	Widowed	Separated/ divorced	Percent widowed
1990												
55 to 64	2,614,986	235,586	2,194,804	98,060	86,536	3.7	2,902,748	229,922	2,023,751	522,574	126,501	18.0
65 and over	2,773,479	211,885	2,022,866	477,313	61,415	17.2	4,421,124	403,594	1,512,800	2,367,851	136,879	53.6
75 and over	1,114,976	76,838	712,221	306,957	18,960	27.5	2,193,119	218,872	450,458	1,469,550	54,239	67.0
1991												
55 to 64	2,878,300	282,000	2,366,000	103,900	126,400	3.6	3,149,100	240,100	2,213,000	529,300	166,700	16.8
65 and over	3,139,500	242,300	2,344,500	473,400	79,300	15.1	4,860,700	416,200	1,780,300	2,495,300	168,900	51.3
80 and over	649,000	43,900	378,400	216,400	10,300	33.3	1,465,600	140,600	209,000	1,078,400	37,600	73.6
Germany												
1970												
55 to 64	3,136,600	135,849	2,795,380	123,806	81,565	3.9	4,304,130	391,801	2,501,628	1,240,028	170,673	28.8
65 and over	3,086,797	132,357	2,317,143	585,809	51,488	19.0	4,903,787	573,521	1,547,339	2,655,939	126,988	54.2
75 and over	879,316	36,175	517,775	315,902	9,464	35.9	1,680,054	200,600	275,032	1,172,131	32,291	69.8
1982												
55 to 64	2,737,400	110,800	2,445,600	101,800	79,200	3.7	3,806,500	338,900	2,494,500	788,400	184,700	20.7
65 and over	3,216,000	130,100	2,425,600	595,500	64,800	18.5	5,957,100	568,700	1,702,800	3,478,200	207,400	58.4
75 and over	1,251,000	55,800	793,100	383,500	18,600	30.7	2,631,400	287,600	422,800	1,853,800	67,200	70.4
1988												
55 to 64	3,265,133	171,216	2,822,046	126,924	144,947	3.9	3,638,278	278,386	2,515,148	650,779	193,965	17.9
65 and over	3,245,688	123,379	2,473,976	567,492	80,841	17.5	6,269,329	575,328	1,874,546	3,581,410	238,045	57.1
75 and over	1,403,904	57,930	921,075	397,205	27,694	28.3	3,158,012	301,265	515,681	2,247,150	93,916	71.2
1991												
55 to 64	4,373,900	222,400	3,763,800	167,100	220,600	3.8	4,666,500	314,800	3,274,100	782,600	295,000	16.8
65 and over	4,020,000	135,000	3,068,800	713,300	102,900	17.7	7,894,300	684,600	2,422,900	4,431,400	355,400	56.1
80 and over	839,100	32,800	464,100	328,000	14,200	39.1	2,173,200	201,800	221,700	1,682,600	67,100	77.4
Greece												
1971												
55 to 64	443,948	21,160	404,516	13,760	4,512	3.1	475,724	27,660	330,596	109,892	7,576	23.1
65 and over	418,340	20,520	333,732	60,980	3,108	14.6	537,928	27,268	209,620	296,292	4,748	55.1
1981												
55 to 64	423,832	18,590	392,225	9,090	3,927	2.1	474,844	29,626	339,831	96,267	9,120	20.3
65 and over	549,829	21,442	455,562	69,132	3,693	12.6	689,372	32,763	300,341	349,441	6,827	50.7
75 and over	189,998	7,189	139,959	41,876	974	22.0	264,206	10,700	75,114	176,850	1,542	66.9
1991												
55 to 64	631,100	24,400	583,800	15,100	7,800	2.4	669,000	37,200	505,800	111,100	14,900	16.6
65 and over	617,900	21,300	506,700	85,200	4,700	13.8	786,200	39,900	333,700	403,300	9,300	51.3
80 and over	127,800	3,800	83,200	40,300	500	31.5	182,400	7,400	38,200	135,800	1,000	74.5

Table 7.
Marital Status of Older Persons by Sex: Selected Years 1970 to 1995—Con.

Country, year, and age	Males						Females					
	Total	Single	Married	Widowed	Separated/ divorced	Percent widowed	Total	Single	Married	Widowed	Separated/ divorced	Percent widowed
Italy												
1971												
55 to 64	2,801,212	298,550	2,349,235	122,338	31,089	4.4	3,113,265	462,317	1,964,472	658,670	27,806	21.2
65 and over	2,551,027	274,118	1,767,979	490,320	18,610	19.2	4,291,661	560,307	1,199,330	2,516,342	15,682	58.6
75 and over	792,656	76,604	440,808	271,304	3,940	34.2	1,599,749	196,832	231,759	1,167,450	3,708	73.0
1981												
55 to 64	2,701,149	202,979	2,373,486	88,985	35,699	3.3	3,101,906	346,690	2,106,252	603,772	45,192	19.5
65 and over	3,069,244	202,032	2,332,399	508,423	26,390	16.6	4,415,882	559,459	1,574,337	2,255,207	26,879	51.1
75 and over	968,219	58,630	610,114	293,738	5,737	30.3	1,715,514	226,393	328,589	1,155,103	5,429	67.3
1991												
55 to 64	3,181,517	280,975	2,743,058	101,805	55,679	3.2	3,508,194	319,232	2,514,835	611,081	63,046	17.4
65 and over	3,543,710	266,190	2,723,996	521,379	32,145	14.7	5,187,215	598,889	1,936,734	2,609,396	42,196	50.3
75 and over	1,390,939	98,795	934,508	349,425	8,211	25.1	2,412,277	296,759	521,426	1,583,248	10,844	65.6
Luxembourg												
1970												
55 to 64	19,244	1,979	15,556	987	722	5.1	21,480	2,536	13,220	5,060	664	23.6
65 and over	17,886	1,875	11,717	3,929	365	22.0	24,953	3,513	8,121	12,933	386	51.8
75 and over	5,214	541	2,581	2,030	62	38.9	8,252	1,213	1,363	5,594	82	67.8
1981												
55 to 64	15,768	1,152	13,320	730	566	4.6	19,580	1,991	12,702	4,234	653	21.6
65 and over	19,475	1,828	13,483	3,753	411	19.3	30,071	3,770	9,354	16,393	554	54.5
75 and over	6,355	640	3,562	2,064	89	32.5	12,003	1,666	2,002	8,198	137	68.3
1990												
55 to 64	20,987	1,541	17,622	905	919	4.3	22,355	1,716	15,488	4,196	955	18.8
65 and over	18,605	1,448	13,364	3,403	390	18.3	32,079	3,478	10,077	17,804	720	55.5
75 and over	7,490	652	4,464	2,253	121	30.1	15,305	1,795	2,586	10,657	267	69.6
1991												
55 to 64	20,000	1,600	17,400	900	100	4.5	21,700	1,500	15,200	4,000	1,000	18.4
65 and over	18,700	1,400	13,600	3,400	300	18.2	31,500	3,400	10,100	17,400	600	55.2
80 and over	3,500	300	1,800	1,400	-	40.0	8,200	1,000	900	6,200	100	75.6
Norway												
1977												
55 to 64	225,959	25,747	183,355	7,811	9,046	3.5	240,003	22,689	170,526	36,105	10,683	15.0
65 and over	246,374	29,372	169,746	41,329	5,927	16.8	330,581	56,141	122,789	141,280	10,371	42.7
75 and over	87,866	10,638	49,369	26,362	1,497	30.0	137,309	27,338	28,632	77,551	3,788	56.5

Table 7.
Marital Status of Older Persons by Sex: Selected Years 1970 to 1995—Con.

Country, year, and age	Males						Females					
	Total	Single	Married	Widowed	Separated/ divorced	Percent widowed	Total	Single	Married	Widowed	Separated/ divorced	Percent widowed
1987												
55 to 64	205,426	22,396	162,185	6,938	13,907	3.4	214,785	13,942	154,254	32,800	13,789	15.3
65 and over	279,469	30,272	196,651	43,209	9,337	15.5	389,091	48,425	149,830	175,993	14,843	45.2
75 and over	103,545	11,613	62,201	27,508	2,223	26.6	175,379	28,112	37,746	104,299	5,222	59.5
1990												
55 to 64	189,896	19,499	148,294	6,241	15,862	3.3	197,620	11,176	141,924	29,311	15,209	14.8
65 and over	287,792	30,270	202,542	43,934	11,046	15.3	403,097	44,698	157,295	184,534	16,570	45.8
75 and over	109,513	11,652	66,783	28,460	2,618	26.0	187,275	26,518	41,784	112,943	6,030	60.3
Sweden												
1977												
55 to 64	485,407	60,352	373,892	17,190	33,973	3.5	503,768	41,444	353,317	69,435	39,572	13.8
65 and over	569,226	72,692	379,408	93,513	23,613	16.4	731,307	111,360	277,795	306,841	35,311	42.0
75 and over	196,040	24,546	108,314	57,709	5,471	29.4	299,053	55,811	61,415	170,692	11,135	57.1
1987												
55 to 64	430,710	51,961	314,445	12,890	51,414	3.0	453,167	29,892	312,671	54,378	56,226	12.0
65 and over	656,804	75,836	442,831	97,296	40,841	14.8	873,689	92,422	344,972	375,320	60,975	43.0
75 and over	262,793	30,692	155,617	65,161	11,323	24.8	418,064	56,500	97,876	241,690	21,998	57.8
1990												
55 to 64	410,001	47,096	300,165	11,379	51,361	2.8	430,341	27,471	292,651	49,418	60,801	11.5
65 and over	656,389	73,101	453,183	87,668	42,437	13.4	883,652	82,936	347,240	384,817	68,659	43.5
75 and over	267,774	29,616	169,597	57,379	11,182	21.4	431,817	50,656	102,240	253,530	25,391	58.7
1991												
55 to 64	410,000	47,100	296,500	11,700	54,700	2.9	430,400	27,500	292,700	49,400	60,800	11.5
65 and over	656,400	73,100	440,600	96,800	45,900	14.7	883,700	82,900	347,200	384,900	68,700	43.6
80 and over	131,900	14,600	69,400	42,900	5,000	32.5	245,500	33,300	37,500	162,500	12,200	66.2
United Kingdom												
1971												
55 to 64	3,066,265	261,004	2,625,123	144,487	35,651	4.7	3,429,830	381,665	2,362,674	627,135	58,356	18.3
65 and over	2,797,594	205,576	2,017,125	558,282	16,611	20.0	4,478,190	670,920	1,560,502	2,215,089	31,679	49.5
75 and over	836,948	54,024	477,624	302,586	2,714	36.2	1,758,765	286,784	328,555	1,138,201	5,225	64.7
1986												
55 to 64	2,887,500	254,700	2,378,300	122,800	131,700	4.3	3,081,300	215,300	2,206,300	496,500	163,200	16.1
65 and over	3,353,200	253,000	2,424,800	595,600	79,800	17.8	5,141,000	543,800	1,901,900	2,560,500	134,800	49.8
75 and over	1,200,900	90,200	735,900	355,300	19,500	29.6	2,401,500	304,900	513,600	1,543,600	39,400	64.3
1989												
55 to 64	2,858,414	243,222	2,338,294	112,999	163,899	4.0	3,016,178	190,734	2,170,898	460,063	194,483	15.3
65 and over	3,572,010	274,562	2,575,814	620,944	100,690	17.4	5,381,756	523,576	2,025,176	2,664,399	168,605	49.5
75 and over	1,337,065	102,474	827,817	380,173	26,601	28.4	2,595,328	301,632	575,773	1,664,908	53,015	64.2

Table 7.
Marital Status of Older Persons by Sex: Selected Years 1970 to 1995—Con.

Country, year, and age	Males						Females					
	Total	Single	Married	Widowed	Separated/ divorced	Percent widowed	Total	Single	Married	Widowed	Separated/ divorced	Percent widowed
1991												
55 to 64	2,830,900	239,000	2,302,100	111,300	178,500	3.9	2,972,200	181,300	2,141,800	440,300	208,800	14.8
65 and over	3,615,000	270,100	2,588,200	649,500	107,200	18.0	5,395,100	500,500	2,067,700	2,664,000	162,900	49.4
80 and over	623,800	42,600	335,600	236,500	9,100	37.9	1,464,200	181,200	225,200	1,037,000	20,800	70.8
Eastern Europe												
Bulgaria												
1975												
55 to 64	399,856	5,200	371,413	18,158	5,085	4.5	421,076	7,511	325,704	79,592	8,269	18.9
65 and over	443,012	5,261	337,884	96,187	3,680	21.7	523,533	7,397	254,612	256,559	4,965	49.0
75 and over	124,090	1,302	72,341	49,703	744	40.1	168,484	1,994	47,626	117,873	991	70.0
1985												
55 to 64	546,879	12,003	496,119	25,456	13,301	4.7	585,811	12,275	440,441	112,741	20,354	19.2
65 and over	457,842	7,580	337,949	106,035	6,278	23.2	565,291	10,024	244,652	300,620	9,995	53.2
75 and over	167,096	2,710	97,001	65,537	1,848	39.2	227,723	3,910	61,026	159,920	2,867	70.2
Czech Republic												
1980												
55 to 64	646,909	30,915	560,440	25,694	29,860	4.0	757,775	35,490	501,161	175,962	45,162	23.2
65 and over	748,674	30,868	552,105	144,297	21,404	19.3	1,142,571	70,785	362,731	669,794	39,261	58.6
75 and over	216,008	8,322	128,248	75,290	4,148	34.9	423,983	30,902	65,033	317,468	10,580	74.9
1989												
55 to 64	720,089	34,655	614,501	29,873	41,060	4.1	846,664	30,023	554,083	199,660	62,898	23.6
65 and over	704,266	28,969	533,614	118,548	23,135	16.8	1,130,671	55,210	359,250	664,393	51,818	58.8
75 and over	265,668	10,527	175,047	74,270	5,824	28.0	511,891	27,642	91,946	375,925	16,378	73.4
1991												
55 to 64	485,282	21,760	409,028	21,265	33,229	4.4	565,195	16,135	368,270	131,779	49,011	23.3
65 and over	489,675	19,107	356,042	93,838	20,688	19.2	811,044	34,933	239,197	492,742	44,172	60.8
80 and over	75,446	2,608	37,850	33,167	1,821	44.0	181,553	10,137	15,299	150,259	5,858	82.8
Hungary												
1976												
55 to 64	471,397	16,807	418,320	19,074	17,196	4.0	564,878	31,121	361,430	139,244	33,083	24.7
65 and over	557,457	20,147	414,958	108,933	13,419	19.5	800,008	50,955	257,228	464,137	27,688	58.0
75 and over	162,652	4,692	94,283	60,856	2,821	37.4	280,962	18,199	38,698	217,790	6,275	77.5
1986												
55 to 64	567,845	22,572	487,560	27,575	30,138	4.9	685,094	29,792	433,756	166,222	55,324	24.3
65 and over	515,498	18,487	374,827	107,177	15,007	20.8	819,853	47,980	231,717	503,256	36,900	61.4
75 and over	192,833	7,412	113,810	67,929	3,682	35.2	357,205	23,005	49,790	273,930	10,480	76.7

Table 7.
Marital Status of Older Persons by Sex: Selected Years 1970 to 1995—Con.

Country, year, and age	Males						Females					
	Total	Single	Married	Widowed	Separated/ divorced	Percent widowed	Total	Single	Married	Widowed	Separated/ divorced	Percent widowed
1989												
55 to 64	547,931	22,285	465,530	27,561	32,555	5.0	662,671	25,597	416,800	161,665	58,609	24.4
65 and over	535,389	18,887	390,517	109,317	16,668	20.4	862,052	47,279	248,978	521,985	43,810	60.6
75 and over	204,680	7,760	121,514	71,327	4,079	34.8	385,184	23,653	52,833	296,162	12,536	76.9
1990												
55 to 64	539,776	21,090	453,667	29,436	35,583	5.5	653,691	24,073	409,295	163,563	56,760	25.0
65 and over	527,464	16,842	390,600	102,433	17,589	19.4	846,458	44,039	253,434	509,434	39,551	60.2
75 and over	199,768	6,594	125,595	62,906	4,673	31.5	376,704	21,843	58,239	284,462	12,160	75.5
Poland												
1978												
55 to 64	1,211,200	38,400	1,101,700	45,200	25,900	3.7	1,522,000	113,600	993,200	368,600	46,600	24.2
65 and over	1,388,900	43,000	1,104,900	222,300	18,700	16.0	2,172,200	181,500	703,300	1,258,800	28,600	58.0
75 and over	385,600	11,400	256,700	113,900	3,600	29.5	766,200	67,800	123,000	570,100	5,300	74.4
1984												
55 to 64	1,641,271	54,071	1,473,349	73,417	40,434	4.5	2,024,326	123,823	1,345,924	483,866	70,713	23.9
65 and over	1,341,418	38,950	1,043,812	241,080	17,576	18.0	2,207,176	166,816	666,087	1,344,280	29,993	60.9
70 and over	938,479	26,397	695,277	205,868	10,937	21.9	1,644,993	128,420	397,829	1,101,010	17,734	66.9
1990												
55 to 64	1,742,197	70,907	1,533,881	83,049	54,360	4.8	2,074,692	118,507	1,377,955	491,912	86,318	23.7
65 and over	1,404,164	46,287	1,081,221	253,365	23,291	18.0	2,322,883	184,703	721,607	1,378,164	38,409	59.3
75 and over	528,952	18,610	348,848	155,425	6,069	29.4	1,042,532	89,835	170,848	772,187	9,662	74.1
Russia												
1979												
55 to 64	3,598,610	32,251	3,322,879	139,191	104,289	3.9	7,055,198	411,867	3,545,580	2,519,277	578,474	35.7
65 and over	3,700,362	26,021	3,098,671	517,776	57,894	14.0	9,968,778	363,730	2,142,027	7,140,170	322,851	71.6
70 and over	1,998,396	14,470	1,565,276	392,666	25,984	19.6	6,182,892	203,761	948,649	4,883,918	146,564	79.0
1989												
55 to 64	6,942,945	102,302	6,116,488	364,262	359,893	5.2	9,771,292	488,703	5,699,250	2,631,832	951,507	26.9
65 and over	3,692,094	35,229	2,930,172	649,073	77,620	17.6	10,398,320	565,746	2,440,030	6,921,921	470,623	66.6
70 and over	2,329,920	20,141	1,750,402	521,426	37,951	22.4	7,268,664	343,289	1,186,416	5,492,090	246,869	75.6
1994												
55 to 64	366,460	9,155	317,394	19,729	20,182	5.4	486,535	21,691	291,920	119,644	53,281	24.6
65 and over	252,865	4,148	201,743	40,672	6,302	16.1	610,580	46,964	173,707	352,483	37,425	57.7
70 and over	118,227	2,128	86,897	27,074	2,128	22.9	371,823	30,489	68,415	255,071	17,847	68.6
Ukraine												
1979												
55 to 64	1,536,226	12,883	1,434,156	55,538	33,649	3.6	2,830,603	157,805	1,491,656	978,717	202,425	34.6
65 and over	1,817,794	12,834	1,498,157	285,300	21,503	15.7	4,014,982	123,325	1,013,444	2,768,943	109,270	69.0
70 and over	1,057,319	7,467	811,681	227,721	10,450	21.5	2,488,489	67,845	477,088	1,894,225	49,331	76.1

Table 7.
Marital Status of Older Persons by Sex: Selected Years 1970 to 1995—Con.

Country, year, and age	Males						Females					
	Total	Single	Married	Widowed	Separated/ divorced	Percent widowed	Total	Single	Married	Widowed	Separated/ divorced	Percent widowed
1989												
55 to 64	2,587,874	29,964	2,327,836	128,685	101,389	5.0	3,591,248	202,424	2,148,575	925,496	314,753	25.8
65 and over	1,760,852	15,367	1,388,448	326,937	30,100	18.6	4,272,908	203,089	1,110,959	2,790,571	168,289	65.3
70 and over	1,098,497	8,774	808,501	266,538	14,684	24.3	2,891,993	114,439	514,048	2,180,036	83,470	75.4
North America/Oceania												
Australia												
1971												
55 to 64	545,204	45,336	447,152	25,203	27,513	4.6	561,775	40,449	379,001	113,384	28,941	20.2
65 and over	446,861	39,512	304,336	84,045	18,968	18.8	618,134	66,024	205,434	327,640	19,036	53.0
75 and over	139,676	11,843	76,882	46,206	4,745	33.1	245,906	29,185	43,297	168,544	4,880	68.5
1981												
55 to 64	650,931	49,771	529,859	25,983	45,318	4.0	675,286	32,792	473,366	120,806	48,322	17.9
65 and over	601,119	44,954	433,077	94,236	28,852	15.7	828,278	67,572	307,052	423,622	30,032	51.1
1990												
55 to 64	732,290	56,128	602,022	24,079	50,061	3.3	725,232	30,065	528,761	111,423	54,983	15.4
65 and over	812,087	56,227	609,784	112,308	33,768	13.8	1,095,493	66,573	476,259	510,286	42,375	46.6
75 and over	281,389	19,384	188,195	65,739	8,071	23.4	474,737	35,973	132,427	294,852	11,485	62.1
1991												
55 to 64	710,813	54,128	566,398	22,934	67,353	3.2	709,389	31,267	507,554	100,234	70,334	14.1
65 and over	816,199	56,745	599,208	111,264	48,982	13.6	1,090,493	67,929	469,178	499,139	54,247	45.8
Canada												
1976												
55 to 64	928,045	76,195	777,515	32,395	41,940	3.5	996,385	79,035	689,700	177,195	50,455	17.8
65 and over	875,410	83,760	627,260	133,350	31,040	15.2	1,126,900	115,260	421,745	561,060	28,835	49.8
75 and over	295,525	29,160	176,600	81,415	8,350	27.5	452,260	47,805	94,615	303,770	6,070	67.2
1986												
55 to 64	1,124,055	83,035	925,650	36,590	78,780	3.3	1,204,255	72,305	849,405	188,285	94,260	15.6
65 and over	1,133,320	85,555	843,940	153,370	50,455	13.5	1,505,735	76,300	618,240	753,915	57,280	50.1
75 and over	394,450	32,270	255,565	93,035	13,580	23.6	653,025	65,000	146,185	428,370	13,470	65.6
1991												
55 to 64	1,180,025	80,375	976,260	33,670	89,720	2.9	1,219,600	68,575	864,175	169,170	117,680	13.9
65 and over	1,330,435	92,385	1,001,765	171,620	64,665	12.9	1,842,540	141,155	755,165	859,380	86,840	46.6
75 and over	478,980	34,990	320,305	105,820	17,865	22.1	795,925	73,545	191,820	509,490	21,070	64.0
New Zealand												
1976												
55 to 64	127,006	8,974	107,512	5,224	5,296	4.1	136,617	8,869	97,188	24,638	5,922	18.0
65 and over	118,528	8,005	87,948	19,074	3,501	16.1	159,917	15,828	62,423	77,594	4,072	48.5
75 and over	35,170	2,405	21,654	10,368	743	29.5	61,522	6,816	13,161	40,616	929	66.0

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Country, year, and age	Males						Females					
	Total	Single	Married	Widowed	Separated/ divorced	Percent widowed	Total	Single	Married	Widowed	Separated/ divorced	Percent widowed
1986												
55 to 64	142,167	10,149	114,519	5,778	11,721	4.1	142,566	6,996	101,250	23,196	11,124	16.3
65 and over	141,021	8,697	103,446	22,389	6,489	15.9	195,846	14,643	77,778	96,273	7,152	49.2
75 and over	47,736	2,910	30,357	12,903	1,566	27.0	81,558	7,431	18,600	53,670	1,857	65.8
1991												
55 to 64	137,658	9,312	108,423	5,502	14,421	4.0	136,578	6,048	95,712	20,871	13,947	15.3
65 and over	157,056	9,573	113,310	25,248	8,925	16.1	215,802	13,983	85,413	106,851	9,555	49.5
70 and over	97,992	5,724	67,209	20,589	4,470	21.0	150,327	10,656	46,923	87,549	5,199	58.2
Africa												
Egypt												
1976												
55 to 64	958,317	37,177	874,779	41,407	4,954	4.3	899,492	40,880	443,885	405,378	9,349	45.1
65 and over	634,402	33,320	514,470	82,736	3,876	13.0	667,501	38,058	153,724	470,612	5,107	70.5
1986												
55 to 64	1,238,704	48,149	1,120,342	63,506	6,707	5.1	1,259,315	43,457	680,465	518,032	17,361	41.1
65 and over	948,486	83,080	724,867	135,776	4,763	14.3	849,250	71,024	201,228	569,026	7,972	67.0
Liberia												
1974												
55 to 59	17,775	860	14,676	824	1,415	4.6	11,742	323	7,496	2,783	1,140	23.7
60 and over	51,862	2,317	38,598	5,418	5,529	10.4	37,525	1,252	14,539	17,150	4,584	45.7
1984												
55 to 64	45,432	2,228	37,237	2,391	3,576	5.3	36,603	1,204	22,801	9,348	3,250	25.5
65 and over	50,088	2,323	37,362	5,606	4,797	11.2	37,029	1,475	14,740	17,105	3,709	46.2
75 and over	21,859	1,005	15,579	3,112	2,163	14.2	15,661	663	4,952	8,440	1,606	53.9
Malawi												
1977												
55 to 64	113,484	1,541	105,276	2,670	3,997	2.4	121,332	1,248	75,813	30,271	14,000	24.9
65 and over	122,194	1,740	106,166	8,794	5,494	7.2	125,828	1,711	49,739	61,215	13,163	48.6
1987												
55 to 64	146,761	1,847	135,439	3,620	5,855	2.5	163,741	1,211	101,139	38,944	22,447	23.8
65 and over	157,832	1,725	136,110	12,234	7,763	7.8	168,526	1,724	65,391	79,558	21,853	47.2
Morocco												
1971												
55 to 64	332,610	11,022	304,773	10,540	6,275	3.2	299,453	10,486	132,260	139,550	17,157	46.6
65 and over	373,255	13,137	314,402	36,746	8,970	9.8	340,641	14,275	65,949	243,393	17,024	71.5

Table 7.
Marital Status of Older Persons by Sex: Selected Years 1970 to 1995—Con.

Country, year, and age	Males						Females					
	Total	Single	Married	Widowed	Separated/ divorced	Percent widowed	Total	Single	Married	Widowed	Separated/ divorced	Percent widowed
1982												
55 to 64	481,613	8,035	451,518	13,881	8,179	2.9	456,984	5,515	240,762	188,131	22,576	41.2
65 and over	424,846	7,546	367,417	40,397	9,486	9.5	375,217	7,542	85,414	266,817	15,444	71.1
75 and over	170,260	3,703	137,207	24,492	4,858	14.4	143,225	2,939	18,571	116,189	5,526	81.1
Tunisia												
1975												
55 to 64	158,120	3,920	147,150	5,810	1,240	3.7	129,470	3,090	81,400	41,840	3,140	32.3
65 and over	118,990	3,390	100,740	13,540	1,320	11.4	100,420	4,160	30,890	61,720	3,650	61.5
1984												
55 to 64	191,330	4,390	180,140	5,840	960	3.1	172,480	3,340	113,800	53,310	2,030	30.9
65 and over	167,260	6,490	141,600	18,220	950	10.9	131,950	4,780	44,280	81,490	1,400	61.8
75 and over	48,480	3,510	35,850	8,870	250	18.3	41,190	2,690	6,760	31,420	320	76.3
Zimbabwe												
1982												
55 to 64	144,250	6,495	127,455	4,515	5,785	3.1	126,060	3,852	76,407	39,088	6,713	31.0
65 and over	115,930	6,906	94,868	9,267	4,889	8.0	122,770	5,902	44,383	66,995	5,490	54.6
75 and over	47,310	3,523	36,815	5,255	1,717	11.1	53,440	3,138	14,879	33,147	2,276	62.0
1992												
55 to 64	190,189	4,733	170,402	6,016	9,038	3.2	170,913	2,809	101,725	53,358	13,021	31.2
65 and over	161,452	4,502	133,898	14,600	8,452	9.0	181,464	3,796	57,980	110,813	8,875	61.1
75 and over	51,977	1,616	40,495	7,223	2,643	13.9	68,301	1,670	14,061	49,974	2,596	73.2
Asia												
Bangladesh												
1974												
55 to 64	1,695,311	14,144	1,595,451	83,804	1,912	4.9	1,339,206	4,104	577,702	752,369	5,031	56.2
65 and over	1,372,987	12,345	1,211,675	147,891	1,076	10.8	1,001,340	4,916	208,707	785,640	2,077	78.5
1981												
55 to 64	1,969,488	28,747	1,864,985	74,559	1,197	3.8	1,599,535	13,736	743,735	838,107	3,957	52.4
65 and over	1,704,863	4,187	1,518,419	181,204	1,053	10.6	1,249,841	1,360	344,564	901,865	2,052	72.2
China												
1982												
50 to 59	38,995,450	1,158,670	33,740,040	3,315,600	781,140	8.5	35,626,300	75,270	29,271,140	6,112,760	167,130	17.2
60 to 79	33,773,360	858,010	23,850,350	8,534,660	530,340	25.3	37,708,310	109,310	16,658,820	20,794,240	145,940	55.1
80 and over	1,760,680	44,160	654,620	1,047,130	14,770	59.5	3,280,380	8,710	234,240	3,033,140	4,290	92.5
1990												
55 to 64	39,380,260	1,257,460	33,411,980	4,083,470	627,350	10.4	36,427,780	72,370	27,982,040	8,234,090	139,280	22.6
65 and over	28,717,770	645,970	19,113,740	8,623,420	334,640	30.0	34,476,600	104,770	12,794,280	21,463,040	114,510	62.3

Table 7.
Marital Status of Older Persons by Sex: Selected Years 1970 to 1995—Con.

Country, year, and age	Males						Females					
	Total	Single	Married	Widowed	Separated/ divorced	Percent widowed	Total	Single	Married	Widowed	Separated/ divorced	Percent widowed
India												
1971												
55 to 64	14,352,002	347,164	11,826,418	2,112,133	66,287	14.7	12,841,066	58,031	5,965,813	6,753,204	64,018	52.6
65 and over	9,383,212	226,541	6,620,836	2,491,958	43,877	26.6	8,928,952	32,093	2,220,930	6,646,582	29,347	74.4
1981												
55 to 64	17,887,880	368,498	15,361,824	2,087,576	69,982	11.7	16,697,610	59,948	9,116,951	7,438,739	81,972	44.5
65 and over	12,625,093	253,621	9,375,358	2,947,660	48,454	23.3	12,377,227	50,035	3,579,769	8,705,536	41,887	70.3
Indonesia												
1971												
55 to 64	2,208,419	35,096	1,950,347	194,512	28,464	8.8	2,356,115	20,125	932,949	1,314,944	88,097	55.8
65 and over	1,439,842	19,751	1,128,295	269,286	22,510	18.7	1,528,535	12,753	354,997	1,115,343	45,442	73.0
75 and over	380,399	5,848	268,882	99,578	6,091	26.2	406,459	3,749	68,887	324,097	9,726	79.7
1976												
55 to 64	2,599,515	20,860	2,316,786	249,730	12,139	9.6	2,649,323	20,146	1,058,867	1,545,260	25,050	58.3
65 and over	1,572,899	9,595	1,251,201	301,798	10,305	19.2	1,803,247	12,599	348,882	1,431,870	9,896	79.4
75 and over	417,437	2,362	300,153	111,812	3,110	26.8	478,171	2,938	58,956	414,644	1,633	86.7
1980												
55 to 64	3,279,731	23,881	3,015,928	191,399	48,523	5.8	3,339,175	32,654	1,618,490	1,477,193	210,838	44.2
65 and over	2,188,609	19,761	1,787,537	340,079	41,232	15.5	2,581,307	26,825	657,722	1,764,132	132,628	68.3
75 and over	688,422	7,251	507,540	159,786	13,845	23.2	836,951	9,420	144,331	648,026	35,174	77.4
1985												
55 to 64	4,150,070	56,189	3,771,237	264,788	57,856	6.4	4,473,933	40,512	2,041,873	2,061,647	329,901	46.1
65 and over	2,618,922	26,118	2,124,396	426,160	42,248	16.3	2,954,026	21,759	549,132	2,213,245	169,890	74.9
75 and over	729,005	5,767	532,776	178,879	11,583	24.5	916,813	6,372	90,512	780,658	39,271	85.1
1990												
55 to 64	4,540,690	113,977	4,088,207	272,502	66,004	6.0	4,817,458	53,968	2,655,717	1,856,429	251,344	38.5
65 and over	3,142,674	118,932	2,518,407	449,038	56,297	14.3	3,608,432	70,754	1,021,497	2,361,881	154,300	65.5
75 and over	867,636	47,364	606,681	193,902	19,689	22.3	1,104,720	31,098	194,441	842,176	37,005	76.2
Israel												
1972												
55 to 64	127,355	3,596	116,915	4,918	1,926	3.9	134,120	3,310	94,420	32,802	3,588	24.5
65 and over	110,538	2,677	88,717	17,656	1,488	16.0	113,961	3,430	41,604	66,832	2,095	58.6
1983												
55 to 64	141,342	4,226	129,478	4,393	3,245	3.1	163,422	3,530	119,598	34,253	6,041	21.0
65 and over	169,283	4,030	137,302	24,744	3,207	14.6	192,019	4,951	79,336	102,411	5,321	53.3
75 and over	60,465	1,388	43,366	14,684	1,027	24.3	67,408	2,055	15,846	47,982	1,525	71.2

Table 7.
Marital Status of Older Persons by Sex: Selected Years 1970 to 1995—Con.

Country, year, and age	Males						Females					
	Total	Single	Married	Widowed	Separated/ divorced	Percent widowed	Total	Single	Married	Widowed	Separated/ divorced	Percent widowed
Japan												
1970												
55 to 64	3,772,600	43,100	3,478,000	198,500	53,000	5.3	4,343,800	78,400	2,722,200	1,414,300	128,900	32.6
65 and over	3,226,900	32,100	2,442,700	711,900	40,200	22.1	4,107,700	48,500	1,281,600	2,704,200	73,400	65.8
75 and over	876,600	8,400	529,800	329,200	9,200	37.6	1,361,100	14,200	186,200	1,141,500	19,200	83.9
1985												
55 to 64	5,784,982	109,141	5,364,533	191,339	119,969	3.3	6,609,453	263,400	4,881,645	1,181,843	282,565	17.9
65 and over	5,095,746	47,209	4,180,133	797,467	70,937	15.6	7,351,751	124,142	2,694,778	4,346,636	186,195	59.1
75 and over	1,813,509	13,310	1,278,654	500,860	20,685	27.6	2,887,622	32,324	538,231	2,265,126	51,941	78.4
1990												
55 to 64	6,990,985	176,504	6,413,813	221,829	178,839	3.2	7,410,535	312,820	5,710,590	1,071,493	315,632	14.5
65 and over	5,963,891	64,365	4,988,364	823,176	87,986	13.8	8,810,928	204,089	3,569,894	4,773,326	263,619	54.2
75 and over	2,220,234	17,428	1,645,043	531,680	26,083	23.9	3,686,493	53,258	777,384	2,776,361	79,490	75.3
1995												
55 to 64	7,518,569	272,591	6,701,187	227,297	254,228	3.0	7,910,020	325,156	6,144,309	1,030,404	373,261	13.0
65 and over	7,504,253	105,804	6,303,893	932,077	128,926	12.4	10,756,569	321,441	4,634,464	5,391,760	344,639	50.1
75 and over	2,563,989	22,958	1,936,331	567,389	30,047	22.1	4,605,588	86,456	1,010,944	3,366,835	106,299	73.1
Malaysia												
1970												
55 to 64	251,597	9,898	214,974	20,924	5,801	8.3	227,642	4,287	122,921	93,206	7,228	40.9
65 and over	164,368	9,384	119,938	29,028	6,018	17.7	152,489	3,535	43,179	99,730	6,045	65.4
1980												
55 to 64	287,996	8,654	255,709	18,763	4,870	6.5	299,080	5,477	172,777	104,199	16,627	34.8
65 and over	233,965	8,795	178,027	40,205	6,938	17.2	239,300	5,088	71,172	145,507	17,533	60.8
1991												
55 to 64	402,570	9,852	368,465	20,408	3,845	5.1	419,473	8,510	273,984	124,282	12,697	29.6
65 and over	305,244	5,785	245,931	48,512	5,016	15.9	350,597	4,970	126,996	204,693	13,938	58.4
75 and over	98,529	1,936	70,060	24,467	2,066	24.8	120,098	1,804	28,858	84,330	5,106	70.2
Pakistan												
1972												
55 to 64	1,683,118	80,865	1,393,651	204,778	3,824	12.2	1,273,400	20,178	809,238	440,741	3,243	34.6
65 and over	1,478,378	44,024	1,079,356	352,154	2,844	23.8	3,234,616	21,044	2,030,933	1,179,010	3,629	36.4
75 and over	552,803	18,045	362,656	171,132	970	31.0	419,931	9,162	119,092	290,965	712	69.3
1981												
55 to 59	859,488	14,884	794,801	48,028	1,775	5.6	751,369	7,281	605,383	136,584	2,121	18.2
60 and over	3,313,787	86,400	2,831,735	388,411	7,241	11.7	2,419,875	63,724	1,200,062	1,148,854	7,235	47.5

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	Total	Single	Married	Widowed	Separated/ divorced	Percent widowed	Total	Single	Married	Widowed	Separated/ divorced	Percent widowed
Philippines												
1970												
55 to 64	713,283	20,114	630,558	58,108	4,503	8.1	705,960	55,312	461,663	181,836	7,149	25.8
65 and over	504,464	13,479	381,080	106,603	3,302	21.1	525,339	38,095	207,556	276,324	3,364	52.6
1975												
55 to 64	877,576	40,727	768,372	63,484	4,993	7.2	827,618	48,835	580,469	189,778	8,536	22.9
65 and over	604,964	33,886	461,399	105,292	4,387	17.4	595,711	42,056	269,671	277,730	6,254	46.6
1980												
55 to 64	968,578	29,252	854,546	77,289	7,491	8.0	1,029,004	72,616	693,846	250,470	12,072	24.3
65 and over	792,595	24,520	616,185	146,465	5,425	18.5	838,298	69,601	366,999	394,730	6,968	47.1
75 and over	228,270	8,051	154,003	64,728	1,488	28.4	246,437	21,440	67,126	156,115	1,756	63.3
1990												
55 to 64	1,252,033	38,677	1,116,273	86,573	10,510	6.9	1,313,456	87,637	892,949	315,344	17,526	24.0
65 and over	948,705	29,669	738,412	173,753	6,871	18.3	1,108,875	97,039	467,385	534,591	9,860	48.2
75 and over	307,422	10,761	208,594	85,965	2,102	28.0	378,595	38,167	103,757	234,128	2,543	61.8
Singapore												
1970												
55 to 64	59,042	3,531	50,314	4,751	446	8.0	55,246	3,133	28,893	22,784	436	41.2
65 and over	30,589	2,147	21,621	6,582	239	21.5	38,775	2,161	8,787	27,683	144	71.4
75 and over	5,840	453	3,347	2,000	40	34.2	11,187	527	1,325	9,311	24	83.2
1980												
55 to 64	66,784	3,176	59,039	3,749	820	5.6	64,308	2,252	38,520	22,372	1,164	34.8
65 and over	51,202	2,350	38,762	9,548	542	18.6	62,722	3,405	18,485	40,337	495	64.3
75 and over	12,036	579	7,702	3,643	112	30.3	19,234	1,030	2,999	15,111	94	78.6
1990												
55 to 64	90,500	5,700	78,100	5,500	1,200	6.1	91,400	3,200	60,100	26,400	1,700	28.9
65 and over	73,300	3,700	54,200	14,800	600	20.2	89,000	3,400	29,800	55,000	800	61.8
70 and over	44,000	2,000	30,500	11,200	300	25.5	58,800	2,500	15,600	40,300	400	68.5
South Korea												
1975												
55 to 64	783,671	1,095	728,831	50,993	2,752	6.5	892,965	1,254	467,699	420,490	3,522	47.1
65 and over	458,360	615	355,840	100,902	1,003	22.0	748,040	941	181,991	563,677	1,431	75.4
1980												
55 to 64	894,976	1,912	834,595	55,062	3,407	6.2	1,052,347	1,466	565,995	480,351	4,535	45.6
65 and over	539,414	876	431,132	106,394	1,012	19.7	906,571	913	220,236	683,937	1,485	75.4
75 and over	116,991	268	74,234	42,324	165	36.2	283,692	286	32,966	250,092	348	88.2

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	Total	Single	Married	Widowed	Separated/ divorced	Percent widowed	Total	Single	Married	Widowed	Separated/ divorced	Percent widowed
1995												
55 to 64	1,596,591	5,927	1,499,393	74,968	16,303	4.7	1,810,937	5,942	1,186,514	598,709	19,772	33.1
65 and over	974,330	1,808	815,153	153,578	3,791	15.8	1,665,290	2,927	440,708	1,215,198	6,457	73.0
75 and over	260,048	427	186,012	73,003	606	28.1	573,460	834	65,165	506,334	1,127	88.3
Sri Lanka												
1971												
55 to 64	342,783	25,214	293,162	21,899	2,508	6.4	274,747	12,435	177,589	82,827	1,896	30.1
65 and over	292,430	22,033	223,007	45,656	1,734	15.6	246,160	11,096	100,276	133,899	889	54.4
1981												
55 to 64	405,454	25,772	355,413	21,676	2,593	5.3	358,507	14,579	244,312	97,734	1,882	27.3
65 and over	338,873	22,779	265,274	48,884	1,936	14.4	305,118	14,813	136,087	152,809	1,409	50.1
Thailand												
1970												
55 to 64	687,607	25,334	594,563	54,016	13,694	7.9	721,851	15,945	434,047	243,036	28,823	33.7
65 and over	460,737	23,922	333,654	91,808	11,353	19.9	583,995	11,594	202,726	353,804	15,871	60.6
1980												
55 to 64	932,326	15,364	822,471	77,139	17,352	8.3	997,614	25,938	613,225	320,551	37,900	32.1
65 and over	671,668	10,201	501,902	145,231	14,334	21.6	853,188	17,268	296,823	517,907	21,190	60.7
70 and over	386,275	5,939	267,797	103,989	8,550	26.9	528,191	10,279	146,404	360,432	11,076	68.2
1990												
55 to 64	1,627,822	52,846	1,417,897	127,917	29,162	7.9	1,723,075	56,163	1,142,804	465,812	58,296	27.0
65 and over	1,131,407	44,519	835,546	231,174	20,168	20.4	1,363,274	30,205	536,726	764,705	31,638	56.1
70 and over	667,111	27,407	460,389	167,344	11,971	25.1	860,452	17,973	274,956	550,120	17,403	63.9
Turkey												
1970												
55 to 64	951,639	16,694	865,461	60,010	9,474	6.3	946,802	11,550	638,241	284,091	12,920	30.0
65 and over	684,680	11,572	549,466	117,734	5,908	17.2	817,867	11,765	308,100	486,917	11,085	59.5
1975												
55 to 64	895,135	32,224	805,594	48,186	9,131	5.4	914,943	38,931	614,073	245,626	16,313	26.8
65 and over	801,249	44,047	619,132	130,474	7,596	16.3	969,729	60,407	388,614	500,981	19,727	51.7
1980												
55 to 64	967,439	22,123	893,743	41,817	9,756	4.3	975,850	13,164	693,394	256,682	12,610	26.3
65 and over	955,360	20,399	752,991	172,800	9,170	18.1	1,157,887	14,871	481,671	648,208	13,137	56.0
1985												
55 to 64	1,380,066	28,291	1,284,548	54,261	12,966	3.9	1,398,850	18,976	1,017,093	346,272	16,509	24.8
65 and over	954,926	18,470	748,052	180,204	8,200	18.9	1,170,704	16,223	475,642	667,269	11,570	57.0

Table 7.
Marital Status of Older Persons by Sex: Selected Years 1970 to 1995—Con.

Country, year, and age	Males						Females					
	Total	Single	Married	Widowed	Separated/ divorced	Percent widowed	Total	Single	Married	Widowed	Separated/ divorced	Percent widowed
1990												
55 to 64	1,761,298	34,446	1,650,099	59,431	17,322	3.4	1,793,326	22,037	1,335,717	413,793	21,779	23.1
65 and over	1,090,850	20,965	886,618	173,513	9,754	15.9	1,325,943	18,206	569,358	724,501	13,878	54.6
Latin America/Caribbean												
Argentina												
1970												
55 to 64	938,600	118,650	749,600	49,950	20,400	5.3	992,750	124,750	614,800	226,800	26,400	22.8
65 and over	724,450	87,850	493,150	129,950	13,500	17.9	876,700	110,850	308,400	445,750	11,700	50.8
75 and over	208,200	24,000	117,300	64,100	2,800	30.8	291,500	36,750	63,700	188,650	2,400	64.7
1980												
55 to 64	1,090,965	116,159	896,474	50,401	27,931	4.6	1,191,687	133,844	755,984	262,711	39,148	22.0
65 and over	987,982	107,117	706,281	155,419	19,165	15.7	1,302,582	160,471	452,848	669,452	19,811	51.4
70 and over	590,415	64,492	395,104	120,372	10,447	20.4	826,343	103,444	222,769	490,740	9,390	59.4
1991												
55 to 64	1,129,077	120,783	888,809	57,121	62,364	5.1	1,319,846	127,009	807,549	296,062	89,226	22.4
65 and over	1,138,581	110,297	812,425	174,899	40,960	15.4	1,627,578	176,108	522,746	881,156	47,568	54.1
75 and over	386,680	36,748	243,419	95,506	11,007	24.7	648,202	74,766	110,816	451,171	11,449	69.6
Brazil												
1970												
55 to 64	2,080,906	117,992	1,758,355	133,771	70,788	6.4	2,043,382	175,812	1,124,890	621,538	121,142	30.4
65 and over	1,396,751	72,597	1,015,451	258,351	50,352	18.5	1,544,432	140,333	441,444	893,075	69,580	57.8
1980												
55 to 64	2,709,662	143,380	2,356,365	132,353	77,564	4.9	2,778,572	231,878	1,673,165	716,213	157,316	25.8
65 and over	2,199,520	117,384	1,668,831	347,749	65,556	15.8	2,470,392	235,135	793,478	1,356,397	85,382	54.9
Chile												
1971												
55 to 64	247,633	24,539	197,296	19,359	6,439	7.8	276,181	37,411	151,615	74,114	13,041	26.8
65 and over	201,118	18,802	136,287	41,207	4,822	20.5	251,027	37,912	74,803	131,433	6,879	52.4
75 and over	60,675	5,427	35,258	18,761	1,229	30.9	86,307	13,288	15,349	56,174	1,496	65.1
1982												
55 to 64	302,711	31,299	241,927	19,558	9,927	6.5	344,408	43,255	203,488	76,669	20,996	22.3
65 and over	287,638	28,954	197,508	52,482	8,694	18.2	371,879	53,125	126,330	178,798	13,626	48.1
75 and over	92,864	8,885	55,420	26,075	2,484	28.1	137,260	21,109	28,832	83,984	3,335	61.2
1992												
55 to 64	406,075	41,716	323,126	20,700	20,533	5.1	462,026	58,346	280,729	88,224	34,727	19.1
65 and over	373,449	37,657	257,933	62,475	15,384	16.7	503,595	63,813	180,658	235,912	23,212	46.8
75 and over	132,292	12,463	81,197	34,045	4,587	25.7	207,623	27,380	48,547	125,070	6,626	60.2

Table 7.
Marital Status of Older Persons by Sex: Selected Years 1970 to 1995—Con.

Country, year, and age	Males						Females					
	Total	Single	Married	Widowed	Separated/ divorced	Percent widowed	Total	Single	Married	Widowed	Separated/ divorced	Percent widowed
Colombia												
1973												
55 to 64	395,786	43,414	316,836	26,770	8,766	6.8	403,634	69,306	207,199	111,126	16,003	27.5
65 and over	299,484	31,809	207,661	53,065	6,949	17.7	342,120	60,872	105,687	167,070	8,491	48.8
1985												
55 to 59	345,873	26,764	290,287	14,411	14,411	4.2	352,050	41,175	203,819	74,116	32,940	21.1
60 and over	784,394	65,881	586,751	100,880	30,882	12.9	831,744	107,056	308,816	364,403	51,469	43.8
Costa Rica												
1973												
55 to 64	39,351	4,115	32,029	1,909	1,298	4.9	39,167	6,458	23,106	7,096	2,507	18.1
65 and over	32,702	3,599	22,642	5,168	1,293	15.8	33,296	6,299	12,145	13,548	1,304	40.7
75 and over	10,807	1,247	6,291	2,851	418	26.4	11,544	2,302	2,770	6,202	270	53.7
1984												
55 to 64	54,514	5,213	45,003	1,913	2,385	3.5	56,027	8,763	34,001	8,522	4,741	15.2
65 and over	52,041	5,477	36,492	7,570	2,502	14.5	55,933	9,852	21,046	21,942	3,093	39.2
Guatemala												
1973												
55 to 64	100,058	8,159	83,279	7,953	667	7.9	94,108	13,023	53,138	26,247	1,700	27.9
65 and over	73,959	6,582	51,972	14,867	538	20.1	74,802	11,814	24,653	37,424	911	50.0
75 and over	23,579	2,097	14,316	7,007	159	29.7	25,081	3,993	5,524	15,362	202	61.2
1981												
55 to 64	125,908	5,644	108,742	9,040	2,482	7.2	117,092	8,227	70,359	31,774	6,732	27.1
65 and over	93,140	3,968	69,588	17,315	2,269	18.6	94,014	7,839	33,092	48,828	4,255	51.9
75 and over	32,128	1,342	21,124	8,915	747	27.7	33,955	2,971	7,922	21,920	1,142	64.6
1990												
55 to 64	195,354	7,863	172,362	10,005	5,124	5.1	199,174	7,543	118,131	56,075	17,425	28.2
65 and over	146,250	3,228	116,379	23,400	3,243	16.0	159,006	3,788	61,285	83,944	9,989	52.8
Jamaica												
1970												
55 to 64	53,807	16,138	34,415	2,199	1,055	4.1	50,360	13,974	27,288	8,114	984	16.1
65 and over	43,594	11,381	26,398	5,028	787	11.5	55,256	20,420	16,128	18,108	600	32.8
1982												
55 to 64	49,521	15,240	30,697	2,050	1,534	4.1	54,979	17,464	28,053	7,977	1,485	14.5
65 and over	61,420	15,029	36,874	7,793	1,724	12.7	73,341	24,550	24,016	23,453	1,322	32.0

Table 7.
Marital Status of Older Persons by Sex: Selected Years 1970 to 1995—Con.

Country, year, and age	Males						Females					
	Total	Single	Married	Widowed	Separated/ divorced	Percent widowed	Total	Single	Married	Widowed	Separated/ divorced	Percent widowed
Mexico												
1970												
55 to 64	952,598	55,632	823,597	53,600	19,769	5.6	977,114	81,251	623,100	229,334	43,429	23.5
65 and over	859,166	81,679	645,216	110,833	21,438	12.9	932,239	120,540	392,106	382,919	36,674	41.1
75 and over	271,779	37,022	177,074	50,339	7,344	18.5	328,790	54,929	102,390	159,468	12,003	48.5
1980												
55 to 64	1,273,532	65,294	1,113,910	69,869	24,459	5.5	1,304,622	98,556	860,345	286,550	59,171	22.0
65 and over	1,203,238	62,144	937,252	179,373	24,469	14.9	1,353,191	117,562	617,558	577,993	40,078	42.7
1990												
55 to 64	1,675,140	82,527	1,477,323	79,133	36,157	4.7	1,797,342	125,817	1,226,032	356,232	89,261	19.8
65 and over	1,556,114	77,296	1,206,941	234,191	37,686	15.0	1,766,379	139,195	796,040	766,937	64,207	43.4
Peru												
1972												
55 to 64	280,616	20,816	227,278	26,798	5,724	9.5	288,578	32,227	169,416	77,644	9,291	26.9
65 and over	235,807	18,545	161,290	51,956	4,016	22.0	279,079	35,798	98,591	139,363	5,327	49.9
70 and over	147,746	12,549	94,501	38,427	2,269	26.0	182,453	24,630	54,489	100,448	2,886	55.1
1981												
55 to 64	368,119	23,428	307,249	29,661	7,781	8.1	363,542	30,159	232,596	86,250	14,537	23.7
65 and over	323,413	19,897	231,329	65,962	6,225	20.4	356,488	30,420	139,776	176,824	9,468	49.6
Uruguay												
1975												
55 to 64	125,100	17,700	97,000	5,100	5,300	4.1	132,000	17,500	79,500	27,500	7,500	20.8
65 and over	118,100	14,800	81,100	17,500	4,700	14.8	150,500	23,100	47,600	74,500	5,300	49.5
75 and over	37,500	4,700	21,900	9,700	1,200	25.9	59,100	9,900	10,900	36,700	1,600	62.1
1985												
55 to 64	141,422	17,790	110,433	5,090	8,109	3.6	155,862	15,924	95,950	31,577	12,411	20.3
65 and over	138,397	16,131	97,208	18,833	6,225	13.6	191,265	24,851	61,440	96,336	8,638	50.4
75 and over	49,013	5,327	30,593	11,225	1,868	22.9	79,218	11,440	14,451	50,854	2,473	64.2

Note: Data for "Married" include people living in consensual unions. Data for Czech Republic prior to 1991 refer to Czechoslovakia.

Source: U.S. Census Bureau, 2000a.

Table 8.
Support Ratios: 2000, 2015, and 2030

Country	Total ¹			Youth ²			Elderly ³			Oldest old ⁴		
	2000	2015	2030	2000	2015	2030	2000	2015	2030	2000	2015	2030
United States	70	70	87	48	45	49	21	25	37	26	26	26
Western Europe												
Austria	62	61	77	37	31	32	25	30	45	22	26	28
Belgium	68	68	83	39	35	36	28	33	46	21	29	29
Denmark	63	71	79	39	39	38	24	32	41	27	24	31
France	71	71	81	43	39	38	27	32	44	23	31	31
Germany	60	64	80	34	31	33	26	33	46	22	27	28
Greece	64	66	74	36	32	30	28	34	44	20	30	31
Italy	60	65	75	31	28	26	29	36	49	22	30	32
Luxembourg	63	64	73	40	39	39	23	25	34	21	27	26
Norway	70	70	80	44	41	40	26	30	40	29	26	30
Sweden	71	70	82	41	34	36	29	36	46	29	27	34
United Kingdom	69	68	80	43	37	37	27	31	42	25	27	30
Eastern Europe												
Bulgaria	64	58	69	37	26	25	27	32	44	13	23	28
Czech Republic	59	58	68	37	28	27	22	30	42	17	22	30
Hungary	61	58	66	38	30	29	24	28	37	17	24	28
Poland	67	56	71	46	33	33	20	23	38	17	25	25
Russia	64	54	70	43	33	35	21	21	35	16	23	20
Ukraine	65	57	68	42	34	35	23	24	33	16	21	21
North America/Oceania												
Australia	67	67	77	46	40	40	21	26	37	24	26	28
Canada	63	62	78	42	35	37	21	26	41	25	27	27
New Zealand	69	65	69	49	42	39	19	23	30	25	26	28
Africa												
Egypt	97	73	65	90	64	51	7	9	13	10	12	14
Kenya	139	90	70	133	83	61	7	7	9	13	17	21
Liberia	133	139	115	125	129	106	8	10	9	17	21	25
Malawi	149	115	84	142	109	78	7	7	6	10	13	17
Morocco	103	73	67	93	64	51	9	9	15	14	17	15
Tunisia	87	58	59	76	46	39	11	12	20	13	20	18
Zimbabwe	134	98	84	126	88	72	8	10	12	15	20	28
Asia												
Bangladesh	112	70	61	105	63	49	7	7	12	15	13	13
China	67	56	65	56	41	39	12	15	26	13	18	18
India	94	73	67	85	63	52	9	10	15	13	14	16
Indonesia	82	69	65	74	58	47	8	11	18	10	17	16
Israel	86	76	73	67	56	48	18	20	26	24	27	26
Japan	61	78	82	33	34	31	27	44	52	22	28	39
Malaysia	96	81	79	88	70	62	8	11	17	14	14	17
Pakistan	126	87	68	117	79	57	9	8	11	13	15	14
Philippines	105	85	73	98	76	60	7	9	13	14	15	16
Singapore	46	42	54	36	30	31	10	12	23	21	24	20
South Korea	58	58	68	47	40	35	11	18	33	14	19	21
Sri Lanka	75	62	66	64	46	40	11	15	25	16	18	20
Thailand	65	60	66	54	44	38	11	16	27	14	18	19
Turkey	83	60	60	72	47	40	11	13	21	15	20	19
Latin America/Caribbean												
Argentina	84	76	71	65	55	46	19	21	25	22	26	27
Brazil	80	64	64	71	51	42	10	13	22	15	19	21
Chile	77	65	70	64	47	42	13	18	28	17	19	22
Colombia	86	73	73	77	61	53	9	11	20	12	16	16
Costa Rica	90	67	66	80	55	45	10	12	21	18	19	19
Guatemala	132	109	88	123	101	78	8	9	11	14	18	18
Jamaica	89	61	60	76	49	40	13	12	20	22	24	19
Mexico	95	73	67	87	62	50	8	11	17	15	17	19
Peru	99	75	68	90	64	51	9	11	17	15	18	19
Uruguay	82	79	77	59	55	50	24	24	28	21	28	28

¹Total support ratio is the number of people 0 to 19 years and 65 years and over per 100 people 20 to 64 years.

²Youth support ratio is the number of people 0 to 19 years per 100 people 20 to 64 years.

³Elderly support ratio is the number of people 65 years and over per 100 people 20 to 64 years.

⁴Oldest old support ratio is the number of people 80 years and over per 100 people 65 years and over.

Note: Youth and elderly ratios may not sum to total due to rounding.

Source: U.S. Census Bureau, 2000a.

Table 9.
Parent Support Ratios: 1950, 2000, and 2030

Country	Parent support ratio			Parent support ratio for females		
	1950	2000	2030	1950	2000	2030
United States	8	22	33	16	43	63
Western Europe						
Austria	7	20	33	12	39	66
Belgium	8	21	38	16	41	75
Denmark	8	21	36	16	42	72
France	10	23	39	18	46	78
Germany	6	19	36	11	37	72
Greece	9	20	34	17	39	67
Italy	8	22	37	14	43	73
Luxembourg	8	18	28	16	37	54
Norway	11	27	35	21	54	69
Sweden	9	27	45	18	54	90
United Kingdom	9	23	36	17	46	73
Eastern Europe						
Bulgaria	6	11	30	11	22	57
Czech Republic	6	13	30	12	25	60
Hungary	5	14	27	10	26	52
Poland	6	14	27	11	26	53
Russia	9	13	21	14	23	39
Ukraine	10	13	21	17	23	38
North America/Oceania						
Australia	8	19	32	15	39	64
Canada	9	20	33	18	40	66
New Zealand	8	20	26	16	39	51
Africa						
Egypt	2	4	7	4	8	15
Kenya	4	6	11	7	12	22
Liberia	3	8	14	6	15	26
Malawi	4	4	9	7	8	16
Morocco	3	9	9	5	16	18
Tunisia	11	9	12	21	17	23
Zimbabwe	3	9	30	6	17	65
Asia						
Bangladesh	2	7	7	6	14	13
China	3	8	14	5	16	28
India	3	6	9	6	13	19
Indonesia	4	5	10	9	9	19
Israel	3	20	24	7	39	48
Japan	5	18	50	9	34	100
Malaysia	8	6	12	18	12	23
Pakistan	5	7	7	11	15	15
Philippines	5	6	9	9	12	18
Singapore	7	13	14	12	25	27
South Korea	3	7	19	5	14	38
Sri Lanka	8	9	16	20	17	30
Thailand	5	8	15	9	14	30
Turkey	3	9	12	5	18	25
Latin America/Caribbean						
Argentina	4	17	24	9	34	47
Brazil	4	8	15	8	15	29
Chile	4	10	21	9	19	41
Colombia	6	6	12	11	12	22
Costa Rica	8	10	15	16	20	29
Guatemala	3	7	10	7	14	19
Jamaica	3	18	12	7	34	24
Mexico	6	7	11	12	14	21
Peru	4	8	12	7	16	24
Uruguay	11	20	26	23	37	51

Note: The parent support ratio is the number of people aged 80 and over per 100 people aged 50 to 64. The parent support ratio for females is the number of people aged 80 and over per 100 women aged 50 to 64.

Sources: United Nations, 1997 and U.S. Census Bureau, 2000a.

Table 10.
Labor Force Participation Rates by Age and Sex: Selected Years 1970 to 1999

Country	Year	Males						Females					
		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
United States	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
	1982	92.2	92.0	90.1	81.1	57.9	17.7	69.0	65.3	59.2	50.2	34.2	7.9
	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
	1996	92.8	90.8	86.9	77.9	54.3	16.9	76.4	78.0	71.9	59.8	38.2	8.6
	1999	93.0	90.3	87.0	78.4	54.8	16.9	76.8	78.9	74.0	61.8	38.8	8.9
Western Europe													
Austria	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
	1988	95.0	94.7	90.0	65.3	14.2	1.8	63.9	59.4	51.6	24.6	5.7	0.9
	1996	93.6	94.3	86.6	63.7	16.7	4.6	76.7	69.2	59.3	25.4	8.7	2.0
Belgium	1970	96.2	92.2	89.2	82.3	79.3	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
	1999	94.7	91.1	80.3	52.4	18.6	¹⁶ 2.8	79.3	65.0	48.5	27.6	6.7	¹⁶ 0.8
Denmark	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
	1976	94.3	93.9	91.6	87.7	79.3	24.0	71.7	65.6	58.3	47.5	30.1	4.8
	1979	96.6	96.1	93.3	90.8	62.0	16.3	84.2	76.1	66.9	54.8	32.5	4.3
	1986	94.1	92.7	87.4	81.2	49.6	12.8	87.9	81.9	72.9	60.5	26.6	3.3
	1996	93.2	91.5	87.7	81.2	42.0	¹² 18.5	84.7	82.3	72.7	58.7	20.5	¹² 8.7
France	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
	1982	95.5	94.9	90.9	76.9	39.1	5.0	66.6	58.3	54.1	45.0	22.3	2.2
	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
	1990	96.1	95.9	91.6	68.6	18.1	2.8	77.2	71.8	63.2	46.8	16.7	1.5
	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
Germany	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
	1999	93.8	94.5	90.5	76.5	30.3	4.5	77.1	78.3	70.5	55.3	12.7	1.6
Greece	1971	93.8	¹ 91.7	(NA)	² 75.3	(NA)	33.4	30.9	¹ 27.9	(NA)	² 19.8	(NA)	8.4
	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
	1998	96.2	94.3	86.7	71.7	45.4	9.7	66.2	51.7	40.4	28.1	21.2	3.6
Italy	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
	1998	91.7	93.5	80.1	54.1	31.7	6.3	60.8	50.9	38.7	22.7	8.1	1.7

Table 10.
Labor Force Participation Rates by Age and Sex: Selected Years 1970 to 1999—Con.

Country	Year	Males						Females					
		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
Luxembourg	1970	98.0	95.9	91.4	79.3	45.5	10.1	26.3	23.9	22.1	18.6	12.0	4.0
	1981	97.4	96.0	90.0	54.3	28.0	6.5	46.4	30.3	25.6	20.1	12.4	2.8
	1987	96.0	96.0	90.2	55.4	21.2	3.8	53.4	36.4	28.7	18.6	10.3	1.0
	1996	95.7	95.0	84.0	52.7	16.7	2.5	61.3	49.0	35.6	14.9	5.1	0.9
	1999	95.1	94.7	87.1	53.4	15.5	1.9	65.6	60.3	44.1	24.6	11.7	0.6
Norway	1970	³ 96.1	⁴ 95.7	⁵ 91.4	(NA)	⁶ 73.6	⁷ 15.7	³ 42.9	⁴ 48.7	⁵ 46.8	(NA)	⁶ 28.0	⁷ 3.7
	1980	³ 94.3	⁴ 93.3	⁵ 87.7	(NA)	⁶ 62.7	⁷ 12.6	³ 67.8	⁴ 74.0	⁵ 61.0	(NA)	⁶ 32.2	⁷ 2.9
	1985	95.3	95.2	91.7	86.4	72.7	⁸ 27.1	75.7	78.2	72.6	60.0	35.9	⁸ 14.0
	1989	93.7	93.8	90.5	83.2	64.9	23.6	78.9	82.0	75.8	63.2	44.1	11.8
	1996	92.6	91.9	90.5	83.2	62.5	16.5	81.9	83.2	79.1	68.3	48.9	9.3
	1999	92.3	92.2	89.2	84.8	61.1	⁸ 13.4	83.2	85.9	80.1	71.3	49.5	⁸ 8.8
Sweden	1970	90.0	92.9	91.9	88.4	75.7	15.2	49.6	55.0	50.3	41.1	25.7	3.2
	1975	91.9	92.2	90.2	85.5	68.5	11.0	68.2	74.8	68.8	57.7	35.1	3.5
	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
	1985	90.6	92.1	90.3	85.3	63.2	11.3	85.6	87.5	83.1	72.5	45.6	3.1
	1996	89.6	92.0	89.6	83.3	59.7	(NA)	84.2	89.9	87.6	78.4	49.8	(NA)
	1999	88.7	90.7	89.2	84.4	55.5	(NA)	83.4	88.1	85.6	79.0	46.5	(NA)
United Kingdom	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
	1986	93.9	¹ 91.6	(NA)	80.3	53.4	7.5	66.9	¹ 69.9	(NA)	51.5	18.8	2.7
	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
	1999	¹⁰ 92.6	(NA)	¹⁷ 44.7	(NA)	(NA)	(NA)	¹⁰ 76.6	(NA)	¹⁷ 28.2	(NA)	(NA)	(NA)
Eastern Europe													
Bulgaria	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
	1992	94.4	91.9	84.6	58.0	11.1	4.5	93.7	92.9	75.5	10.7	4.7	2.1
Czech Republic	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
	1997	96.9	94.5	89.8	77.2	30.3	8.9	79.9	90.4	82.3	35.0	13.3	2.7
	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
Hungary	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	4.3	69.8	76.1	55.4	15.5	6.0	2.1
	1999	88.0	81.2	72.5	45.9	10.6	⁸ 3.8	70.4	75.3	61.9	16.6	5.5	⁸ 1.6
Poland	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
	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
Russia	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	¹⁰ 92.1	(NA)	93.9	80.5	38.1	¹³ 20.7	¹⁰ 88.9	(NA)	83.6	43.0	21.0	¹³ 11.0
	1996	¹⁰ 90.1	(NA)	87.4	74.2	¹⁴ 19.0	(NA)	¹⁰ 82.0	(NA)	71.3	30.9	¹⁴ 7.2	(NA)
	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

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Ukraine	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
	1995	³ 87.8	⁴ 97.9	88.5	82.2	¹⁵ 34.3	(NA)	³ 84.6	⁴ 98.9	82.7	45.8	¹⁵ 22.1	(NA)
	1999	89.2	86.3	76.4	69.7	28.3	⁸ 9.8	83.3	84.3	70.1	33.4	16.7	⁸ 6.0
North America/Oceania													
Australia	1971	94.8	¹ 93.0	(NA)	88.4	75.6	22.2	41.5	¹ 40.0	(NA)	28.3	16.0	4.2
	1976	95.9	94.5	91.9	86.9	68.4	16.8	53.3	55.2	46.2	35.2	18.2	5.1
	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
	1986	92.1	89.8	85.7	76.4	44.8	9.0	59.0	58.2	46.4	30.9	13.6	3.0
	1997	92.6	¹ 87.3	(NA)	72.3	45.7	10.1	69.8	¹ 68.5	(NA)	41.9	18.9	2.9
	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
Canada	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
	1976	91.6	90.7	88.0	82.4	69.1	19.2	53.8	51.7	46.9	39.5	27.6	6.9
	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
	1986	94.9	93.3	89.9	81.3	59.9	14.6	73.0	67.1	57.9	44.7	27.5	4.7
	1996	91.8	90.8	86.8	72.5	44.7	10.3	78.1	76.3	66.2	48.9	23.8	3.5
	1999	92.1	91.1	86.1	72.2	46.6	9.9	79.9	78.6	70.6	50.6	26.0	3.4
New Zealand	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
	1976	98.1	97.7	95.9	90.5	57.9	16.2	40.2	46.6	40.6	29.0	13.9	2.8
	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
	1989	94.4	93.3	91.9	78.1	33.8	10.6	67.6	75.8	69.8	47.1	14.4	3.5
	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
	1997	87.3	90.5	88.5	79.2	50.5	8.9	67.1	77.5	74.2	53.2	29.3	3.0
	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
Africa													
Egypt	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	¹⁰ 89.3	(NA)	⁵ 97.9	(NA)	76.4	36.5	¹⁰ 27.8	(NA)	⁵ 16.0	(NA)	6.6	2.1
	1998	¹⁰ 91.4	(NA)	⁵ 98.3	(NA)	61.8	33.5	¹⁰ 24.7	(NA)	⁵ 15.4	(NA)	6.5	2.1
Liberia	1974	86.8	91.8	90.4	89.6	80.3	66.0	28.8	33.9	31.4	30.4	23.7	16.2
	1984	84.3	92.7	91.3	90.5	85.8	69.7	55.5	63.9	62.8	59.1	49.5	32.5
Malawi	1977	95.3	¹ 96.1	(NA)	² 94.4	(NA)	83.6	67.4	¹ 72.6	(NA)	² 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
Morocco.....	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	¹¹ 90.3	(NA)	(NA)	⁹ 38.1	(NA)	32.5	¹¹ 17.1	(NA)	(NA)	⁹ 8.9	(NA)
	1995	96.0	¹¹ 90.1	(NA)	(NA)	⁹ 33.5	(NA)	38.5	¹¹ 19.0	(NA)	(NA)	⁹ 7.7	(NA)
	1999	95.0	¹¹ 90.0	(NA)	(NA)	⁹ 43.7	(NA)	35.4	¹¹ 30.1	(NA)	(NA)	⁹ 13.0	(NA)

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		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
Tunisia	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
Zimbabwe	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	⁹ 69.1	(NA)	50.3	52.4	50.6	50.7	⁹ 31.5	(NA)
	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
Asia													
Bangladesh	1974	97.9	¹ 98.3	(NA)	² 95.2	(NA)	84.2	3.0	³ 6.6	(NA)	⁴ 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
	1995	98.2	99.2	98.4	96.6	88.9	71.2	61.2	58.9	57.1	49.6	41.1	27.1
China	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
India	1971	³ 96.0	⁴ 97.1	⁵ 94.0	(NA)	⁹ 73.8	(NA)	³ 20.8	⁴ 22.4	⁵ 19.4	(NA)	⁹ 10.5	(NA)
	1981	¹⁰ 96.1	(NA)	⁵ 93.3	(NA)	⁹ 65.0	(NA)	¹⁰ 34.8	(NA)	⁵ 29.8	(NA)	⁹ 14.0	(NA)
	1991	¹⁰ 95.3	(NA)	⁵ 92.6	(NA)	⁶ 71.4	⁷ 42.3	¹⁰ 39.5	(NA)	⁵ 35.5	(NA)	⁶ 20.8	⁷ 8.2
Indonesia	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
	1976	98.2	97.5	96.3	92.4	87.5	69.7	55.1	62.2	60.9	54.1	48.4	31.2
	1980	94.3	94.1	90.0	84.6	76.7	53.4	40.5	46.8	44.3	40.8	32.9	19.0
	1988	97.1	97.8	95.4	89.1	79.2	56.3	59.9	63.6	60.7	55.6	46.1	25.4
	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
	1996	98.0	¹¹ 99.6	(NA)	(NA)	87.9	56.1	57.9	¹¹ 61.4	(NA)	(NA)	42.7	26.3
	1999	97.2	98.0	95.7	87.6	⁹ 66.5	(NA)	57.7	62.2	60.0	54.3	⁹ 34.0	(NA)
Israel	1972	90.7	¹ 92.7	(NA)	² 86.3	(NA)	34.5	35.9	¹ 33.8	(NA)	² 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
	1989	86.0	¹ 89.3	(NA)	78.6	66.3	21.4	60.5	¹ 53.1	(NA)	39.0	19.0	6.3
	1996	84.4	¹ 87.4	(NA)	75.9	59.0	16.9	65.1	¹ 65.8	(NA)	44.7	19.9	5.1
	1999	83.0	¹ 86.5	(NA)	74.3	56.4	14.6	67.5	¹ 69.2	(NA)	47.6	23.6	4.6
Japan	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
	1975	98.4	98.1	97.5	94.7	85.4	49.7	49.2	61.9	58.6	50.9	39.2	15.8
	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
	1985	98.1	98.0	97.1	93.1	78.3	41.6	56.9	65.9	59.8	49.9	37.9	15.2
	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
	1996	97.8	97.7	97.4	94.6	74.5	36.7	63.6	71.6	66.9	58.1	39.0	15.4
	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
Malaysia	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
	1999	98.4	96.8	92.6	74.6	59.2	(NA)	52.3	46.5	38.3	27.6	20.8	(NA)

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Pakistan.....	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	75.7	(NA)	3.3	2.7	3.1	2.4	2.3	(NA)
	1989	98.1	97.4	94.1	91.2	81.0	55.7	12.9	13.8	10.8	11.2	9.4	2.4
	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
Philippines.....	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
	1975	94.0	95.7	93.5	90.7	84.3	62.6	25.4	24.8	23.4	21.7	19.6	13.7
	1978	97.6	¹ 95.9	(NA)	² 89.1	(NA)	60.6	48.1	¹ 47.5	(NA)	² 40.9	(NA)	23.1
	1983	95.5	¹ 96.6	(NA)	² 88.4	(NA)	60.1	56.9	¹ 60.4	(NA)	² 56.4	(NA)	28.0
	1989	97.9	¹ 97.4	(NA)	² 88.9	(NA)	59.0	53.3	¹ 58.2	(NA)	² 50.7	(NA)	29.4
	1996	97.9	¹ 96.8	(NA)	² 87.2	(NA)	57.3	55.3	¹ 62.3	(NA)	² 54.1	(NA)	29.0
	1999	97.4	¹ 96.8	(NA)	² 88.1	(NA)	54.5	57.2	¹ 64.0	(NA)	² 55.8	(NA)	29.8
Singapore.....	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
	1996	97.8	96.8	91.4	77.9	48.6	21.7	66.6	53.9	43.7	28.4	14.9	5.2
South Korea.....	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
	1980	95.8	95.2	90.6	82.6	68.9	40.6	37.9	51.3	49.0	43.3	31.3	13.0
	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
	1992	95.4	94.9	91.6	84.9	71.0	42.3	51.8	60.9	60.8	54.1	44.9	19.6
	1996	94.7	95.3	91.7	83.7	⁹ 54.5	(NA)	56.0	62.2	57.2	53.3	⁹ 29.2	(NA)
	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
Sri Lanka.....	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	⁹ 38.6	(NA)	46.0	39.0	32.3	27.2	⁹ 7.8	(NA)
	1999	95.1	95.3	88.6	81.1	⁹ 43.3	(NA)	48.3	45.8	34.4	30.4	⁹ 9.8	(NA)
Thailand.....	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
	1976	¹⁰ 93.9	(NA)	⁵ 92.3	(NA)	⁹ 54.9	(NA)	¹⁰ 61.5	(NA)	⁵ 56.2	(NA)	⁹ 23.2	(NA)
	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	³ 97.4	⁴ 97.5	⁵ 92.8	(NA)	⁹ 47.2	(NA)	³ 78.0	⁴ 76.7	⁵ 63.8	(NA)	⁹ 23.5	(NA)
	1997	³ 97.1	⁴ 97.5	⁵ 92.6	(NA)	⁹ 46.4	(NA)	³ 83.4	⁴ 83.8	⁵ 67.9	(NA)	⁹ 26.0	(NA)
	1999	³ 96.3	⁴ 97.3	⁵ 92.3	(NA)	⁹ 43.9	(NA)	³ 81.6	⁴ 81.9	⁵ 67.6	(NA)	⁹ 21.1	(NA)
Turkey.....	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
	1975	92.4	92.1	88.6	82.5	76.8	64.9	46.1	48.2	48.9	46.3	40.7	27.9
	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
Latin America/Caribbean													
Argentina.....	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

Table 10.
Labor Force Participation Rates by Age and Sex: Selected Years 1970 to 1999—Con.

Country	Year	Males						Females					
		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
Brazil	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	³ 96.3	⁴ 93.2	⁵ 82.3	(NA)	⁶ 57.5	⁷ 21.8	³ 34.9	⁴ 30.0	⁵ 21.4	(NA)	⁶ 10.3	⁷ 2.8
	1986	¹⁰ 96.3	(NA)	⁵ 80.5	(NA)	⁹ 44.6	(NA)	¹⁰ 48.0	(NA)	⁵ 30.4	(NA)	⁹ 9.5	(NA)
	1996	³ 94.9	⁴ 93.5	⁵ 82.1	(NA)	⁹ 46.9	(NA)	³ 63.2	⁴ 60.8	⁵ 45.3	(NA)	⁹ 18.5	(NA)
	1998	³ 95.3	⁴ 92.9	⁵ 81.5	(NA)	⁹ 47.5	(NA)	³ 65.8	⁴ 62.6	⁵ 46.6	(NA)	⁹ 19.1	(NA)
Chile	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
	1997	95.7	95.3	90.6	81.2	69.0	27.9	47.6	47.5	38.7	31.8	17.1	6.9
	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
Colombia	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	¹⁰ 91.1	(NA)	¹¹ 86.0	(NA)	⁹ 58.4	(NA)	¹⁰ 44.0	(NA)	¹¹ 31.4	(NA)	⁹ 16.7	(NA)
	1996	¹⁸ 92.4	⁴ 95.1	⁵ 85.3	(NA)	⁶ 51.7	⁷ 24.4	¹⁸ 65.9	⁴ 57.5	⁵ 35.3	(NA)	⁶ 15.7	⁷ 6.1
	1999	¹⁸ 92.4	⁴ 96.0	⁵ 88.2	(NA)	⁶ 55.4	⁷ 25.2	¹⁸ 74.8	⁴ 69.1	⁵ 43.7	(NA)	⁶ 19.3	⁷ 5.4
Costa Rica	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
	1989	¹⁰ 96.2	(NA)	⁵ 87.1	(NA)	⁹ 45.3	(NA)	¹⁰ 38.8	(NA)	⁵ 20.5	(NA)	⁹ 6.4	(NA)
	1996	³ 95.9	⁴ 94.4	⁵ 85.4	(NA)	⁶ 51.4	⁷ 21.1	³ 43.3	⁴ 44.2	⁵ 22.2	(NA)	⁶ 9.1	⁷ 2.8
	1999	³ 96.3	⁴ 95.9	⁵ 88.4	(NA)	⁶ 58.2	⁷ 26.7	³ 49.0	⁴ 46.6	⁵ 30.8	(NA)	⁶ 11.8	⁷ 3.8
Guatemala	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
	1994	94.2	94.7	91.1	88.8	81.6	61.9	21.5	18.5	16.0	13.1	11.0	7.9
	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
Jamaica	1975	97.9	¹ 97.2	(NA)	² 90.9	(NA)	64.7	78.6	¹ 76.1	(NA)	² 56.5	(NA)	27.0
	1978	97.3	¹ 96.9	(NA)	² 90.9	(NA)	65.6	86.0	¹ 80.3	(NA)	² 63.6	(NA)	30.7
	1982	80.7	80.1	78.2	75.1	64.7	37.9	52.8	45.1	40.5	34.6	23.7	9.8
	1988	80.1	¹ 94.6	(NA)	² 90.5	(NA)	52.4	60.9	¹ 73.7	(NA)	² 65.4	(NA)	24.9
	1990	95.8	¹ 94.9	(NA)	² 84.3	(NA)	53.6	85.7	¹ 82.0	(NA)	² 61.3	(NA)	23.6
Mexico	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
	1999	97.1	95.7	91.9	86.8	77.3	52.4	46.1	43.0	37.6	32.4	25.9	14.6
Peru	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

Table 10.
Labor Force Participation Rates by Age and Sex: Selected Years 1970 to 1999—Con.

Country	Year	Males						Females					
		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
Uruguay.....	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

NA - Data not available.

¹ Refers to ages 45 to 54 years.

² Refers to ages 55 to 64 years.

³ Refers to ages 25 to 39 years.

⁴ Refers to ages 40 to 49 years.

⁵ Refers to ages 50 to 59 years.

⁶ Refers to ages 60 to 69 years.

⁷ Refers to ages 70 years and over.

⁸ Refers to ages 65 to 74 years.

⁹ Refers to ages 60 years and over.

¹⁰ Refers to ages 25 to 49 years.

¹¹ Refers to ages 45 to 59 years.

¹² Refers to ages 65 to 66 years.

¹³ Refers to ages 65 to 72 years.

¹⁴ Refers to ages 60 to 72 years.

¹⁵ Refers to ages 60 to 70 years.

¹⁶ Refers to ages 65 to 69 years.

¹⁷ Refers to ages 50 years and over.

¹⁸ 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. The discussion in Chapter 10 touches upon other potential discrepancies within and among countries.

Note: Data for Germany prior to 1996 refer to the former West Germany; data for the Czech Republic prior to 1991 refer to the former Czechoslovakia.

Source: U.S. Census Bureau, 2000a and various issues of the International Labour Office Yearbook of Labour Statistics.

APPENDIX B.

Sources and Limitations of the Data

This report includes data compiled by the International Programs Center (IPC), Population Division, 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 Organization for Economic Co-operation and Development and the European Union). It also includes cross-national information from sources such as the Luxembourg Income Study (<http://lisweb.ceps.lu>), the Network on Health Expectancy and Disability Process (see Chapter 4), the Global Burden of Disease study (<http://www.hsph.harvard.edu/organizations.bdu/>), and other university-based research projects. Some ongoing efforts (e.g., the Luxembourg Income Study and the United Nations Economic Commission for Europe Population Activities Unit Census Microdata Samples Project (<http://www.unece.org/ead/pau>)) involve recoding of data from different countries in order to enhance comparability.

The majority of statistics, including all tabular data shown in Appendix A, are contained in an International Data Base (IDB), maintained and updated by the IPC. The IDB contains annotated statistical tables of demographic, economic, and social information for all countries of the world. Available information from 1950 to the present is supplemented with population projections to the year 2050. Most of the projected

data in *An Aging World: 2001* come from data files of the IPC.

With the initial and ongoing support of the Office of the Demography of Aging, 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. 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. To date, 105 countries have been examined in detail, and selected data for a subset of these nations appear in the tables in Appendix A. 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 the following address:

<http://www.census.gov/ipc/www/idbnew.html>

General information about the Census Bureau's IDB may be obtained by contacting the Chief, International Programs Center, 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 otherwise 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. For the most part, the convergence of national, IPC, United Nations, and other projection series is close for the next 20 to 30 years. This is especially true with regard to older population groups, since persons who will constitute the elderly in 2020 and 2030 already have been born. Because the elderly of tomorrow 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 the very old ages. Because the effects of migration on projected cohorts are in most cases minimal, absolute numbers of elderly persons may therefore 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; elderly 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 numerous developed countries, the issue for projections is whether to assume a future rise in fertility. In some developed countries, changes in migration levels could conceivably have a greater future impact than birth rates on overall age structure.

As discussed in Chapter 3, most of the variation in projections of elderly population 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 decline in mortality rates at older ages that have occurred in developed countries. In the Census Bureau's 1987 *Aging World* report, projections made in 1984 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 on the order of 9 percent by the year 2025. For the most part, best-guess demographic forecasts have tended to be "conservative" vis-a-vis assumed mortality improvement, with the result that future numbers of the elderly 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 vis-à-vis numbers of elderly persons. Toward this end, organizational units including the United Nations Population Division, Eurostat, and the U.S. Census Bureau Population Division, in conjunction with members of academia and sponsors such as the U.S. National Institute on Aging and the American Association of Retired Persons, have begun a concerted effort to use their combined expertise to refine and improve projection procedures. For a detailed critique and discussion of such procedures, see Bongaarts and Bulatao, 2000.

IPC 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 elderly 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. 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 elderly 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 elderly as a whole are not undercounted in censuses to any significantly different extent than are other age groups. In many countries, the elderly are less apt than younger age groups to be geographically mobile and thus should be easier in theory to enumerate. Within the elderly population, however, there are strong 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 greater 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 U.S. 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 to compile information in standard formats within the structure of the International Data Base.

IDB data are not always comparable among countries, essentially for two 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 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 in encouraging disparate national statistical agencies to adhere to defined international standards of data collection and tabulation. As a result, some concepts (literacy, for example) are more internationally comparable than others (e.g., labor force participation).

To the extent possible, the U.S. 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 begun to produce 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 cross-national 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.

APPENDIX C.

International Comparisons of Urban and Rural Definitions

Because of national differences in the characteristics that distinguish urban from rural areas, the distinction between urban and rural population is not amenable to a single definition applicable to all countries. For this reason, the United Nations (UN) recommended in 1970 that each country should decide for itself which areas are urban and which are rural.

The rural population as defined by most national statistical organizations is usually not defined directly, but is simply the residual population after the urban population is distinguished. The UN Statistical Office has classified extant urban definitions into the five principal types listed below.

1. **Administrative Area.** This concept treats as urban the administrative divisions (for example, municipalities, cities, communes, districts, boroughs) that have been so classified by the national government, or certain parts of said divisions, such as their administrative centers, capitals, or principal localities. This classification is based primarily on historical, political, or administrative considerations rather than on statistical considerations. It tends to be relatively static and is not automatically changed after each census to recognize the decreasing size of formerly important places or the increasing size of places that have recently become important.

2. **Population Size.** This concept treats as urban those places (for example, cities, towns, agglomerations, localities) having either a specified minimum number of inhabitants or a specified minimum population density. The UN discussion of the concept "population density" recognizes that suburbs of large places, densely populated fringes around incorporated municipalities, and the like, are sometimes classified as urban in this approach.

Within a fairly broad range, the choice of the minimum qualifying size or density value is arbitrary, although original efforts may have based the cutting score on statistics regarding the presence or absence of various facilities or functions in places of given sizes. The variety of minimum sizes that are or have been in use in national statistical programs reflects the lack of consensus on these matters. It also reflects the fact that a place of given size in a small country with a subsistence-agricultural economy will be relatively more important than in a highly industrialized, populous country such as Japan. Similarly, a size that might have represented a fairly important place in feudal Japan might not be relevant to modern Japan. In some countries (for example, New Zealand) the minimum required size used to record the growth of urban population has increased from census to census. The minimum

required size for urban used by countries in this report during the 1980 census round ranged from agglomerations of at least 200 inhabitants to localities of 10,000 or more inhabitants.

3. **Local Government Area.** This concept defines urban in terms of those places, agglomerations, or localities with a local government. For some countries, this practice might be interpreted as referring to a particular form of local government, especially one having relatively great autonomy. The equivalent in the United States would be the incorporated municipality (city, town, borough, or village). Other terms cited by the UN include chartered towns, local government areas, municipal communities, and burghs. No minimum population size is used in this definition. The remarks about the relatively static character of classifications under the first concept apply here also.

4. **Urban Characteristics.** This concept requires an urban place to possess specific characteristics such as established street patterns, contiguously aligned buildings, and public services that might include a sewer system, a piped water supply, electric lighting, a police station, a hospital, a school, a library, a court of law, and/or a local transportation system. A classification of this sort would need to be developed during or shortly before a census enumeration.

5. **Predominant Economic Activity.** In this formulation, places or areas qualify as urban if a specified minimum proportion of their economically active population is engaged in non-agricultural activities.

Individual national definitions of urban areas are included in each International Data Base country file annotation. For a more thorough discussion of international differences and similarities in urban and rural areas, see Henry Shryock, Jacob Siegel, and Associates, 1971,

The Methods and Materials of Demography, Volume 1, U.S. Bureau of the Census, Washington, DC, pp. 151-68.

APPENDIX D.

References

(Many of the data in this report are taken or derived from hundreds of sources not included in the following reference list. These unnamed sources consist mainly of primary census and survey volumes of individual nations, as well as periodic issues of international compendia such as the International Labour Office *Yearbook of Labour Statistics*, the United Nations *Demographic Yearbook*, and the World Health Organization *World Health Statistics Annual*).

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