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**Back to *Which* Future:
The U.S. Aging Crisis Revisited**

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The AARP Public Policy Institute, formed in 1985, is part of the Policy and Strategy Group at AARP. One of the missions of the Institute is to foster research and analysis on public policy issues of importance to mid-life and older Americans. This publication represents part of that effort.

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FOREWORD

In 2001, AARP released a report entitled *Global Aging: Achieving Its Potential*. It argued that the increase in life expectancy over the past century represents a remarkable success story. Although an aging world poses real challenges to income security, health, and long-term care programs, the report argued that the challenges are manageable if institutions and individuals act in a timely fashion to deal with them. The report suggested a number of strategies to help governments, employers, and individuals adjust to an aging world.

This study builds on that analysis. It reviews new and emerging research that bears on the likely dimensions and consequences of population aging. The report focuses on research dealing with demographic, health, and economic issues surrounding population aging.

The analysis concentrates primarily on research dealing with the United States, but it also touches on other countries relevant to what America is experiencing now or is likely to experience in the future. It concludes with a discussion of implications for the way both individuals and policymakers think about retirement planning for an aging population.

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EXECUTIVE SUMMARY

Background

The simple arithmetic of demographic change is clear. More people are surviving to age 65, and living longer after 65, than in the past. Some believe that the needs of the elderly will result in a massive shift of both public and private resources from such purposes as education and investment in productive capacity to nursing homes and health care.

Yet researchers by no means agree that population aging represents a crisis. Many argue that the aging of the world's population is just as manageable as the youth explosion of the 1950s and 1960s turned out to be.

Purpose and Methodology of the Report

The report reviews and compares the results of new and published research dealing with the demographic, health, and economic aspects of an aging population, with a primary focus on aging in the U.S. This literature affects forecasts of the likely numbers of the elderly, their needs, and what they will be able to contribute to society.

Empirical Results

Key issues examined in the report include the following:

Forecasting Mortality. Mortality rates declined throughout the 20th century, both in the United States and in other developed countries. There is some disagreement, however, on what this decline means for the future. Some observers believe that America is approaching the biological limits on longevity, while others believe those limits are still far away.

Changing Old-Age Dependency Ratios. The Social Security dependency ratio, a key index of population aging in the United States, measures the ratio of the number of people receiving benefits to the number of persons paying into the system. This ratio will rise in future years. But the confidence interval for projections of future dependency ratios is broad.

Health At Retirement, Beyond, and Before. Today's retirees are not just living longer; many are also living healthier. As a result, their chances of entering nursing homes have declined for several decades. But some of these trends may not apply to today's working-age adults.

Health Care Spending. Researchers are finding that aging alone does not increase the elderly's health care needs or spending on them. Health status independently influences health care spending on the aged.

Savings, Capital Investment, and Rates of Return. An older population will typically have more savings than a younger one. The aging of the population will thus increase the ratio of capital to labor, raising real wages and driving down capital returns. But elderly retirees will then need to consume their retirement savings, thus reducing capital levels. At the same time,

different aging paths among countries may mean that some countries will be able to benefit from the capital-labor imbalances of others. The United States, as a relatively young country, could be one of the beneficiaries.

Income. Many of the favorable trends affecting elderly Americans in recent years have not been broadly shared across the income distribution. At the same time, however, there is evidence that it is not income alone that clears the path to a healthy and long old age once a minimum threshold has been met. Such factors as education may play an important role, suggesting that public policies to improve health awareness can be used to spread these benefits more broadly.

Lessons From Abroad—And At Home. All of the countries of the world are not aging at the same rate. Examples from both at home and abroad can help guide the formation of U.S. policies. Some countries—notably Germany and Japan—are already as “old,” measured as the percent of the population age 65 and older, as the United States will be 20 years from now. The U.S. spends much more on health care than many “older” countries, but it has the advantage of higher labor force participation and later retirements among older workers.

And the United States is not homogeneous. For example, health care spending on behalf of the elderly varies dramatically by state, even after accounting for health status. Some researchers have suggested that the reasons for these differences need more study and could point the way to improved health care cost control.

Retirement Income Adequacy. Increased longevity can cause problems not just for the Social Security program, but also for employer pension plan beneficiaries. Employers, employees, and policymakers will face the challenges of making sure workers set aside enough for retirement, make it grow, and make it last.

Conclusions

The report draws three major conclusions from the literature review:

- Today’s elderly Americans are healthier, will live longer, and are better able to live independently than recent generations.
- Population aging alone does not mean much for the rest of society. It does not determine economic growth, the allocation of gross domestic product (GDP) among goods and services, or the distribution of these goods and services among different age and income groups. Rather, the allocational and distributional effects of an aging population depend critically on both the characteristics of the elderly and public policy choices affecting the whole society.
- Neither the dimensions nor the consequences of population aging are predictable, especially when forecasting over a horizon of more than one or two decades.

Recent research that bears on the likely dimensions and consequences of population aging suggests that the dimensions of population aging for the United States are by no means certain; and that policy choices are available for mitigating many consequences of aging.

Although the future is certainly not clear, research does suggest what will matter as the United States and other countries devise policies for dealing with population aging. Several trends and decisions seem to count the most. Continued improvements in health and mortality will reduce both the personal and social costs of population aging. Increasing disability rates among working-age adults, resulting in part from higher rates of obesity, can threaten such improvements. Finally, public policy choices concerning health care coverage, occupational and public safety, and public health education will reduce the cost of aging and improve the quality of life at all ages.

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A little-understood global hazard—the greying of the developed world's population—may actually do more to reshape our collective future than deadly superviruses, extreme climate change or the proliferation of nuclear, biological and chemical weapons.

—Peter G. Peterson, chairman of the U.S. Institute for International Economics, and chairman of the Council on Foreign Relations (1999).

...[D]emography is not cause for despair, at least not in the United States.

—Gerard F. Anderson and Peter Sotir Hussey, writing in the journal *Health Affairs* (2000).

INTRODUCTION

Is population aging a disaster waiting to happen, or a manageable challenge to public and private decision making?

The simple arithmetic of demographic change is clear. More people are surviving to age 65, and living longer after 65, than in the past. Between 1970 and 2000, the share of the U.S. population age 65 or older increased from 9.8 percent to 12.4 percent (U.S. Bureau of the Census 1996, 2001b). The U.S. Bureau of the Census projects that the population under age 65 will grow by about 35 million between 2002 and 2030—as will the 65-and-over population (Figure 1).¹

Proponents of the crisis view of aging predict that the needs of the elderly will result in a massive shift of both public and private resources from such purposes as education and investment in productive capacity to nursing homes and health care.² Yet researchers by no means agree that an aging population is a “global hazard,” to use Peter Peterson’s phrase (above). Many argue that the aging of the world’s population is manageable, just as the youth explosion of the 1950s and 1960s turned out to be (Anderson and Sotir Hussey 2000, AARP 2001, Leone 1996).

A body of new research on both the elderly and on older workers who are still short of retirement is further refining the way many people think about an aging nation. This AARP report reviews that research. The research deals with the demographic, health, and economic aspects of an aging population. The results reported in this literature affect forecasts of the likely numbers of the elderly, their needs, and what they will be able to contribute to society. The report draws three major conclusions from this review:

¹ These statistics follow the general convention of measuring the elderly as those age 65 or older. The use of this convention does not necessarily mean that all those age 65 or older are retired, or that only those age 65 or older are retired. In particular, there is evidence that the recent U.S. trend toward retirement well before age 65 may be leveling off (see, for example, Quinn (1999)).

² Lee and Skinner (1999) summarize a selection of studies with this point of view.

- Today’s elderly Americans are healthier, will live longer, and are better able to live independently than recent generations.
- Population aging alone does not mean much for the rest of society. It does not determine economic growth, the allocation of gross domestic product (GDP) among goods and services, or the distribution of these goods and services among different age and income groups. Rather, the allocational and distributional effects of an aging population depend critically on both the characteristics of the elderly and public policy choices affecting the whole society.
- Neither the dimensions nor the consequences of population aging are predictable, especially when forecasting over a horizon of more than one or two decades.

This report examines several issues surrounding the dimensions and consequences of population aging:

- **Forecasting mortality.** Mortality rates declined throughout the 20th century, both in the United States and in other developed countries. There is some disagreement, however, on what this decline means for the future.
- **Changing dependency ratios.** The Social Security dependency ratio—a key measure of population aging in the United States—will rise over time. But how quickly it rises, and what else is happening in the economy, will have a great impact.
- **Health At Retirement, Beyond, and Before.** Contrary to popular perceptions, aging does not necessarily mean a “home,” arthritis, and a walker. Today’s retirees are not just living longer; many are also living healthier, even at older ages. But some of these trends may not apply to their children (Cutler and Meara 2001).
- **Health Care Spending.** If caring for the elderly demands a large and growing share of GDP, less could be available for investing in younger generations (Gruber and Wise 2001). At the same time, however, researchers are finding that aging alone does not increase health care needs or spending.
- **Savings, Capital Investment, and Rates of Return.** Older people typically have more savings than younger people. To the extent that this pattern continues, the aging of the population will increase the ratio of capital to labor, raising real wages and driving down capital returns (Boersch-Supan et al. 2001). But elderly retirees will then need to consume their retirement savings, thus reducing capital levels. At the same time, however, different aging paths among countries may mean that some countries will be able to benefit from the capital-labor imbalances of others (Boersch-Supan et al. 2001).
- **Income.** The relationships among income, health, and survival are complex and not fully understood. In addition, the population aging and the accompanying changes in capital investment and productivity will affect real incomes of workers.

- **Lessons from abroad—and at home.** All the countries of the world are not aging at the same rate. Some countries—notably Germany and Japan—are already as “old,” measured as the percent of the population age 65 and older, as the United States will be 20 years from now. And the United States as a nation is not homogeneous. For instance, health care spending on behalf of the elderly varies dramatically by state, even after accounting for health care status (Reinhardt 2000). Examples from both at home and abroad can help guide the formation of U.S. policies.
- **Retirement income adequacy.** Increased longevity can cause problems not just for the Social Security program, but also for employer pension plan beneficiaries. Defined contribution plan beneficiaries are at risk of outliving their retirement benefits, and defined benefit plan beneficiaries can see inflation erode the real value of their benefits.

In the following sections of this report new research on these issues is discussed and the implications of these issues for the numbers, spending needs, and retirement income adequacy of the future elderly are explored.

This report does not address the effects of population aging on the Social Security program. Although Social Security costs and benefits are an important aspect of population aging, there is already extensive research and policy literature on this issue. More importantly, the potential impacts of aging on the population and on the economy extend beyond the Social Security program. It is these broader effects that form the focus of this report.

FORECASTING MORTALITY

Understanding and predicting mortality rates is key to understanding the dimensions of population aging. Age-adjusted mortality rates declined at fairly constant rates through much of the 20th century (Lee and Skinner 1999, Cutler and Meara 2001). However, various age groups benefited differently over the course of the century:

- Mortality reductions early in the century were attributable to public health and other measures that improved the ability to withstand disease (Cutler and Meara 2001). These reductions were concentrated at younger ages.
- By the middle of the century, medical advances became more important in reducing mortality, and all age groups benefited.
- In the latter decades of the 20th century, medical advances continued to be important in reducing mortality, and most of the years added to life were at older ages.

This pattern raises questions about whether these gains can be expected to continue. The conclusion one reaches depends in part on the forecasting approach used.

Some researchers approach forecasting mortality by picking a biological limit on longevity. Several researchers choose 85, others 100.³ A higher limit leaves more room for mortality improvements, but any limit is inherently arbitrary.

Instead of seeking a biological limit, others look to international experience. Japan, Sweden, France, and the Netherlands all have higher healthy life expectancy⁴ than the United States (Mathers et al. 2001). Lee and Skinner (1999) argued that international comparisons provide evidence that the U.S. mortality decline is facing neither biological limits nor limits posed by existing medical technology. Based on their evaluation, they argued that Social Security Administration (SSA) forecasts of mortality decline are “...far too low.”

Mortality forecasts based on past experience—whether in the United States or abroad—are inherently backward-looking in that they assume that past trends and experience provide an adequate guide to the future. This assumption is reasonable if one believes that people do not change, so that today’s 50- and 65-year-olds are much like their counterparts 20 years ago, and that 50- and 65-year-olds 20 years from now will resemble their counterparts of today. But people change over time in habits, behavior, and expectations. For this reason, later in this report it will be argued that backward-looking mortality forecasts may be misleading.⁵

OLD-AGE DEPENDENCY RATIOS

Although this report does not address issues related to the Social Security program’s fiscal balance, the Social Security dependency ratio is a basic measure of population aging for the United States.⁶ This ratio compares the number of people receiving benefits to the number paying into the system.

In 2000, 100 workers supported every 29 beneficiaries of the Old-Age, Survivors, and Disability Insurance (OASDI) program (Figure 2). By the year 2030, when virtually all of the baby boomers will be retired⁷, each 100 workers will support from 43 (low-cost projection) to 52 (high-cost projection) retirees, with an intermediate projection of 47 (Figure 2).⁸

³ See studies summarized in Lee and Skinner (1999).

⁴ Healthy Life Expectancy (HALE) is the expected number of years to be lived in what might be termed full health. To calculate HALE, the years of ill health are weighted according to severity and subtracted from the total expectancy to give the equivalent years of healthy life.

⁵ On the other hand, it may not be possible to modify mortality forecasts to take account of long-term behavior changes. Weight loss at 45, for example, may reduce the risk of disability or death at 65, but many other factors can also intervene.

⁶ More broadly, the overall dependency ratio measures the ratio of those, young or old, who are unable to work, relative to those who can produce goods and services both for domestic use and export. The overall dependency ratio is influenced by such factors as fertility rates, decisions about years of schooling, and the labor force participation of married women. This report does not consider trends in *overall* dependency ratios, as opposed to *old-age* dependency ratios, in part because few people (if any) are sounding doom over an impending “youth crisis.”

⁷ The youngest baby boomers will turn 67, the age of eligibility for unreduced old-age benefits, in 2031.

⁸ The Social Security Administration’s intermediate assumptions are its “best estimate” assumptions about the key economic (unemployment, average earnings, inflation, interest rates, and productivity) and demographic (fertility, mortality, net immigration, marriage, divorce, retirement patterns, disability incidence, benefit termination rates, and changes in the labor force) variables that affect the Social Security system’s financial balance. More optimistic

However, projections based on low, intermediate, and high assumptions, although widely used, are not fully satisfactory. One problem is that such projections have no probabilistic interpretation (Lee and Tuljapurkar 1998). They allow the analyst to say which scenario is “better” from a given standpoint, such as Social Security program costs, but not which is more likely. Therefore, the Social Security dependency ratio does not allow an assessment of the likelihood of an aging crisis.

New research attempts to address some of these problems by attaching probabilities to the future age distribution of the population. In a series of papers, Lee and his colleagues⁹ developed stochastic (probability-based) forecasts of mortality, population and its age distribution, and the long-term finances of the Social Security system.

Reflecting the range of outcomes in their underlying forecast parameters, Lee and Tuljapurkar (1998) derived a correspondingly broad range of forecasts of the Social Security system’s finances.¹⁰ Their assessment of the reasons for this uncertainty is important for an understanding of population aging. Through 2070, the greatest sources of uncertainty in their model are fertility, productivity growth, interest rates, and mortality. In contrast, the SSA Board of Trustees puts uncertainty about mortality first in importance, and that about fertility and interest rates last.

Mortality influences the numerator of the dependency ratio and fertility influences the denominator. No matter whether population is forecast stochastically or on a judgmental basis, therefore, the dependency ratio (a key measure of population aging) is highly uncertain.

The confidence intervals for estimates of the Social Security dependency ratio become wider over time. The 95 percent confidence interval for the dependency ratio in 2020 ranges from 0.26 to 0.30, with a mean of 0.28. By 2070, the 95 percent interval ranges from 0.26 to 0.68. Although the population is aging, in other words, one cannot say exactly by how much, especially over the long term. What is known right now simply does not allow researchers to determine whether there is a long-term aging crisis.

HEALTH AT RETIREMENT, BEYOND, AND BEFORE

Even if it is assumed that the U.S. population will age significantly during the lifetimes of those alive today, that says nothing about the quality of this longer life. Falling mortality rates at specific ages could mean either better or poorer health during the added period of life. For example, consider the effect of improved treatment of stroke patients on health and mortality (Cutler 2001). With improved treatment, fewer stroke patients would die, but more would probably spend the remainder of their lives significantly disabled. However, suppose that better treatment meant preventing more strokes. Then people would live longer *and* in better health.

economic and demographic assumptions result in lower costs than under the intermediate assumptions. More pessimistic assumptions result in higher costs.

⁹ For references and a summary of the results of this work, see Lee and Skinner (1999).

¹⁰ Their 95 percent confidence interval for the tax rates Social Security would require in 2070 ranged from a lower limit of 16 percent to an upper limit of 34 percent.

Whether long life means better life is thus an empirical question. This section discusses trends in health and disability among retirees as well as among workers well short of retirement.

Long Life *and* Health?

A discussion of the health and disability status has to begin with definitions. Disability and health, although related, are not the same concept.¹¹ The World Health Organization defines health as “a state of complete physical, mental, and social well-being, and not merely the absence of disease or infirmity.” Defining disability is more complicated.

Three concepts are set out by Cutler (2001):

- A *disability* begins with a pathology, or a cell or tissue change caused by disease or other agents. A pathology may lead to impaired or abnormal physical or mental functioning.
- An *impairment* resulting from disability can lead to functional limitations, defined as the inability to perform certain physical or mental tasks in daily life.
- *Dependence* results from a health-related difficulty in executing activities that are typical or expected of a person. Dependence is related to functional limitations but relies on context. For example, an attorney who is unable to lift 20 pounds would face a functional limitation, but would not be limited in work-related activities. A construction worker, in contrast, would be limited both functionally and occupationally.

Trends in disabilities. Past research suggested that increased life expectancy would mean that most people would spend a longer period of time suffering from poor health and disability.¹² More recent research and evidence contradicts this pessimistic view. For example, disability among all age groups declined throughout the 20th century (Costa and Steckel 1997). Consistent measures of disability suitable for assessing long-term trends are only available for roughly the past two decades, however (Cutler 2001).

If disability rates among the elderly continue to decline over the next two decades as they have in the past, the number of disabled older persons could increase by as little as 15 percent between 2000 and 2020 (Jacobzone 2000). By comparison, both the over-65 and the over-85 populations are projected to grow by more than 50 percent during this period (calculations are based on U.S. Bureau of the Census 2002).

Reasons for the disability decline include medical care improvements; better health behavior (particularly a 15-percentage-point decline in adult smokers since 1960); increased use of aids that make it easier to cope with impairments, both personal (for example, bathroom handrails) and public (for example, street ramps instead of curbs); reduced infectious disease exposure; and improvements in the socioeconomic status of the elderly.

¹¹ This discussion is based on Cutler (2001).

¹² See studies cited in Jacobzone (2000), Wolf (2001).

The role of socioeconomic status in explaining disability suggests that not all groups have benefited equally from the disability decline. The elderly's socioeconomic profile changed over the years examined by Cutler. The share of the elderly with some college more than doubled over the past two decades, and white-collar work also increased (Cutler 2001). More-educated persons have up to a 50 percent lower disability rate than do those with less education (Cutler 2001). In fact, the downward trend in disability appears to have occurred only among persons with more than high school educations (Schoeni et al. 2001). And data on disability decline only recently have included black Americans (Manton and Gu 2001).

The exact channels by which socioeconomic status affects disability incidence are not fully understood, in part because of the close correlation among income, education, and socioeconomic status. Workers with higher socioeconomic status tend to be employed in safer jobs. They may also know more about safeguarding their health and using health care services. In addition, higher income may protect health (see further discussion below). However, health habits and behaviors are not fixed. Healthy living habits that begin with more educated and affluent households can spread to the general population through public education campaigns (Wolf 2001).

Trends in dependence. Dependence—receiving help in carrying out daily activities—among the elderly has declined at one to two percent per year over the last two decades (see studies surveyed in Cutler 2001).¹³ There is some evidence that dependence among the younger elderly (ages 65 to 84) has been declining more quickly than among the older elderly (age 85 and above). However, this result may reflect in part the far lower incidence of dependence in the former group; a small decline from a relatively small starting number will yield a larger percentage than would the same decline from a larger starting number.

Health Before Retirement

Those who are 65 or older today were born before 1938. Most were thus children or adolescents during the Great Depression, and lived through the deprivations of at least one world war. Less than 10 years later, however, came the beginning of the post-World War II baby boom, a generation whose lives have been marked by relatively few restrictions. Can baby boomers expect to benefit from the same health trends as their parents?

Research bearing directly and indirectly on this issue is contradictory, and points to some important dangers that the baby boom generation will face as it tries to replicate its parents' health and longevity. Several trends bear on this question.

Education. Baby boomers are the most college-saturated generation currently in the work force. The baby boomers are more likely to have completed some college, or attained associate degrees, other vocational degrees, or bachelor's degrees than any other group between the ages of 25 and

¹³ The levels of decline measured in each study he reviews differ due to differences in definitions of dependence as well as the time intervals considered. For example, he cites data from the National Long-Term Care Study showing that 25 percent of the elderly were dependent in 1984, but only 19 percent in 1999, for an annual decline of 1.81 percent, and an overall 15-year decline of 24 percent.

65 (U.S. Bureau of the Census 2001). To the extent that education protects against poor health and disability, the downward trend in disability could continue.

Disability trends among working-age adults. As disability rates have fallen among the elderly, it appears that the rates have increased in younger groups (Lakdawalla et al. 2001). After 1984, adults under age 45 stopped getting healthier, reversing a trend that had held for most of this group in the 1970s. In particular, between 1990 and 1996, disabilities increased by nearly one full percentage point among those in their 40s, resulting in a 35 to 40 percent increase in the disabled population at these ages. In contrast, the rate of disability among the elderly fell by about one percentage point over the same period. For five 10-year birth cohorts ranging in age from 22 to 52 in 1984, each cohort was uniformly less healthy than older cohorts at the same age. Younger cohorts were also becoming disabled at a more rapid rate than earlier cohorts.

Several trends have been offered as explanations for this increase, although the research to measure their relative importance remains to be done (Lakdawalla et al. 2001). The increased prevalence of asthma and diabetes, both of which can cause substantial activity limitations, has coincided with the growth in disability. In fact, growth in asthma alone would be more than enough to account for these disability trends (Lakdawalla et al. 2001). Self-reported measures of health status also declined between 1990 and 1996, particularly for people under age 50.

Health status trends are variable, are sensitive to underlying demographic changes, and often reverse every few decades (see, for example, Lakdawalla et al. 2001, Cutler and Meara 2001, Cutler 2001, and Wolf 2001). Further, these trends measured over one or two decades may either mask or be outweighed by longer-term trends in the opposite direction. Twentieth-century trends in age-adjusted death rates are one example of the latter phenomenon. Age-adjusted death rates declined an average of 1 percent per year for men and 1.4 percent per year for women between 1900 and 1991, but the rate for men *rose* by an average of 0.2 percent per year between 1954 and 1968 (Lee and Skinner 1999).

Recent pre-retirement disability trends might thus not continue over the longer term. If they do, however, they have two important potential implications. First, there could be more disabled elderly in the future. Second, depending on the disability, disabled workers may also have a shorter life expectancy.

Obesity and the baby boom generation. The so-called “obesity epidemic” deserves some more detailed attention in assessing the dimensions and consequences of population aging, particularly as the post-war baby boom prepares to enter retirement. Over the last 40 years, overweight American adults have come to outnumber those of healthy weight (U.S. Centers for Disease Control 2000). The share of adults ages 20 to 74 considered *overweight*¹⁴ increased from 43.5 percent from 1960 to 1962 to 55 percent from 1988 to 1994 (Figure 3). The share considered *obese*¹⁵ increased from 12.8 percent from 1960 to 1962 to 22.6 percent from 1988 to 1994.

¹⁴ An adult with a Body Mass Index (BMI) greater than or equal to 25 is considered overweight. BMI is calculated as weight in kilograms divided by height in meters squared.

¹⁵ An adult with a BMI greater than or equal to 30 is considered obese.

These trends have coincided with the baby boom generation's passage into adulthood. The baby boom is the generation born between 1946 and 1964. From 1960 to 1962, when 56.5 percent of adults were of normal weight, none of the baby boomers were yet adults. Twenty-eight years later (by 1988 to 1994), when 55 percent of adults were overweight, all the baby boomers were adults. The growth in obesity has far outpaced the gradual aging of the population into those age groups where "putting on a few pounds" is a common hazard.

Obesity among U.S. adults ages 18 and older is estimated to account for 280,000 to 325,000 deaths per year (Allison et al. 1999). Based on a total of about 2.3 million deaths among persons age 18 and older in 1998, this figure would suggest that from 1 in 7 to 1 in 8 deaths of adults are attributable to obesity. It has been estimated that mortality due to overeating and inadequate exercise is second only to smoking in the annual number of deaths preventable by behavior changes (McGinnis and Foege 1993).

The risk of death increases significantly with body weight, and one long-term study found that the size of this increase varied inversely with age. A study of more than 6,000 overweight and obese patients (followed for a median interval of nearly 15 years) measured the effect of age on the excess mortality associated with various degrees of obesity (Bender et al. 1999). Excess mortality was measured using standardized mortality ratios (SMRs).¹⁶

Obese men ages 18 to 29 had an SMR of 2.46, compared with 1.31 for those ages 50 and older. The difference by age for women was smaller, but still striking—1.81 for ages 18 to 29 compared with 1.26 for those 50 and older. Put another way, obesity carries from three (for women) to five (for men) times the excess risk of death under age 30 as it does at age 50 or older. On the other hand, those obese persons who survive to age 50 and older would seem to face mortality risks closer to those in their age group who are not obese.

Premature mortality is not the only risk associated with obesity. Obesity is strongly related to adult-onset diabetes, which can be severely disabling (U.S. Centers for Disease Control 2002).

The relationships among age, obesity, mortality, and disability would seem to have at least two potentially contradictory implications. On the one hand, today's elderly could be healthier than in the past at least in part because they were healthier in their youth. Obesity was far less prevalent when today's 65-year-olds were 20, or even 40—so even if they gained weight in later life, they may have had less time to develop the associated medical conditions. As a result, mortality improvement forecasts based on the experiences of today's elderly may be relatively optimistic for their children's or grandchildren's generations. These generations face risks of early death that were far less prevalent when their grandparents were young. In other words, life expectancy projections based on the experience of today's elderly could significantly overestimate the proportion of adults who will survive to become elderly.

¹⁶ The SMR is the observed crude death rate in a given population divided by the expected crude death rate, multiplied by 100. It is used to compare the cause-specific death rate in a standard population to the cause-specific death rate for the same disease in other populations.

Alternatively, the death risks associated with obesity may decline by age 50 (Bender et al. 1999). Based on the limited evidence available it is not clear whether the next generation of retirees will be healthy and long-lived like their parents, or will survive an adulthood of obesity only to enter old age with the associated chronic and often debilitating conditions caused by diabetes.

In summary, today's elderly are living both longer and healthier lives. But recent trends in disability and obesity in adults still well short of retirement age and/or "elderly" status suggest that the baby boom and later generations might not be as fortunate.

HEALTH CARE SPENDING

In 1997, the United States spent 5 percent of GDP on health care for the elderly, a share substantially higher than in Germany (3.5 percent) and Japan (3.4 percent), two countries substantially older than the United States (Reinhardt 2000). Rising health care costs are already a serious American public policy problem. Health care spending—on behalf of all age groups—as a share of U.S. GDP more than doubled from 5.2 percent in 1960 to 13.2 percent in 2000 (Anderson et al. 2000, Levit et al. 2002). This increase occurred even without the level of population aging expected over the next two decades. If population aging pushes health care costs up further, policymakers could find it harder to expand coverage, maintain the quality of health care services, and achieve other public policy goals.

What lies ahead? Must the United States give up all hope of restraining the growth of health care costs or improving coverage and delivery as the population ages? This section addresses the relationship between aging and health care costs and the impact of aging on the market for long-term care.

The Medical Cost of Aging

Research on the relationship between medical costs and aging suggests that the future may not be quite as bleak as standard forecasts of medical spending suggest (Cutler 2001). Standard forecasts assume that relative spending by age and sex will remain stable over time. If the population is increasingly healthy, however, spending needs by age and sex will decline. Several studies have found that age alone does not, in fact, explain why older people spend more on health care than younger people. These studies have used different variable specifications, units of analysis, and even countries. This section reviews and compares the results of these studies.

The impact of disabilities on the elderly's health care spending. Cutler (2001) attempted to isolate the separate effect of aging on the elderly's health care spending. He related per capita health spending among Medicare beneficiaries first to age and sex alone, then to age, sex, and disability. If disability was not considered, age was the most powerful predictor of health care spending, with the oldest elderly averaging nearly \$3,500 more in medical spending per year than the youngest elderly.

However, when disability was considered, the impact of age was far less significant. Each disability or functional impairment raised spending by \$653 to \$1200 per year, and dying in the

year after the measurement year—one measure of a person's health status in the measurement year—increased health care spending by \$7,500.

Since health status affects spending, Cutler concluded, future health care spending on the elderly will grow more slowly than the aged population to the extent that the elderly's health status improves. The reverse is also true, however. If the growth in disability among working-age adults observed by Lakdawalla et al. (2001) continues as these adults age, caring for the elderly of the future could be more expensive than caring for those of today.

The impact of mortality rates on the elderly's health care services utilization. The idea that health status influences health care use seems to be fairly robust with respect to variable specification and the unit of observation. Rather than relate individual spending levels to disability measures, Fuchs et al. (2001) considered the impact of inter-area differences in health status on a weighted index of quantities of health care services provided by Medicare. They measured health status by mortality rates, in part because mortality is an objective measure of health status, and measured services rather than spending to avoid the problem of deflating Medicare expenditures for inter-area differences in reimbursements.

They, too, found that health status dominated other variables—including region, population size, and various socioeconomic factors—in explaining health care utilization. Fuchs et al. did not directly test the impact of age composition on utilization, however, so their results only indirectly support those derived by Cutler.

Population aging and health care spending around the world. Chernichovsky and Markowitz (2001) have extended the analysis beyond the United States. In reviewing a series of studies attempting to explain health care spending in different groups of countries, they concluded that differences in population aging have little power in explaining cross-sectional differences in aggregate health expenditures among developed countries. In an analysis of eight industrialized countries, Anderson and Sotir Hussey (2000) likewise found little correlation between the share of GDP spent on health care for those age 65 and older and the share of the population in this age group—their analysis yields a correlation coefficient of -0.07 .

These results do not preclude the possibility that population aging increases health care spending within a country over time. Chernichovsky and Markowitz addressed this issue by attempting to explain health spending per capita in Israel from 1966 to 1998. They found that the only statistically significant predictor of spending per capita in Israel over this period was GDP per capita. Also, they found that shifting disease to higher age groups (resulting from increased longevity and better health among the younger elderly) lowered the demand for disease-related care, thereby lowering the cost of care.

In summary, the increased health care costs generally presumed to accompany an aging population seem to be costs accompanying declining health status and increased rates of disability. As a result, a healthy elderly population need not be an expensive one.

The Changing Market for Long-Term Care¹⁷

Today's workers will probably barely have finished paying off their college loans before they are urged to buy long-term care insurance. With a year in a nursing home costing up to twice as much as one at a top university, planning ahead for long-term care would seem to be prudent (though buying long-term care insurance may not be the appropriate way for everyone to plan, of course). Moreover, one can plan for college tuition, and most students will be able to help defray their college expenses by working, borrowing, or both. Long-term care, in contrast, represents "...an unpredictable need for an unmanageable expense..." (Feder 2001).

Some employers are offering benefits to meet this perceived need. Six percent of employees in medium and large private firms had access to long-term care insurance as an employee benefit in 1999 (U.S. Bureau of Labor Statistics (BLS) 2001). Yet aging does not necessarily bring the need for long-term care. For one thing, an estimated half of Americans who currently need long-term care are under age 65 (Feder et al. 2000).¹⁸

Even more importantly, population aging has been *negatively* related to market output of long-term care in recent years (Lakdawalla and Philipson 2002). For the past two decades, the population over age 75—those who would be more at risk of entering long-term care—has grown at a fairly steady rate of 2.7 percent per year. Various market forces would seem to have propelled an increasing share of this population into nursing homes, including the following:

- Birth rates fell between 1920 and 1940, reducing the number of children available to provide non-market care by the 1990s;
- Changes in the labor market affecting women, the main providers of nonmarket care, increased the opportunity cost of such care;
- Barriers to entry and investment in the nursing home industry were relaxed; and
- The nursing home occupancy rate declined from 91.5 percent in 1991 to 82.7 percent by 1999 (National Center for Health Statistics 2001, U.S. Bureau of the Census 1996, Cutler 2001). This decline suggests that adequate space would have been available if demand were increasing.

Nevertheless, growth in nursing home residents declined between 1971 and 1995, reducing the proportion of elderly in nursing homes by almost 20 percent. Although the number of nursing home residents has continued to grow, this growth has been far slower than the growth in the over-75 population. Put another way, the chances that an older elderly person would live in a nursing home declined by nearly 20 percent between 1971 and 1995. Cutler (2001) found similar results, reporting that *on an age-adjusted basis* the proportion of the elderly in nursing

¹⁷ Long-term care can include nursing home care, assisted living, in-home care, and other arrangements. However, trend data on utilization are only available for nursing home care.

¹⁸ Because the focus of this report is on the needs of the aging population, it does not address trends in long-term care needs among the under-65 population.

homes declined 0.7 percent per year between 1985 and 1995. People are living longer, *and* are not spending the additional years of life in nursing homes.

The most important reasons for the decline in nursing home use appear to be improved health among the elderly and changing sex ratios resulting from improved survival rates of older men. Improved health among the elderly both reduces the number of people who need care and increases the potential supply of nonmarket or family care to those who do. Changes in disability explain an estimated 70 percent of the decline in nursing home demand (Lakdawalla and Philipson 2002). Cutler also cited data from a number of sources showing that, on an age- and sex-adjusted basis, the incidence of both dependence and functional impairment has declined over the last two decades, even among those ages 85 and older (Cutler 2001).

The ratio of elderly men to elderly women can be assumed to represent the rate of marriage among elderly women (Lakdawalla and Philipson 2002). As men are the scarcer sex in old age, relative growth in elderly males raises the prevalence of marriage among the elderly and increases the supply of spousal caregivers. The relative decline in the number of elderly men in the 1970s thus pushed nursing home output upward by reducing marriage rates and the potential availability of spousal caregivers. After the 1970s, in contrast, the male/female ratio improved, contributing to a reduction in nursing home demand.

These results further underscore the importance of mortality and health status to understanding the broader impacts of population aging. However, although they may be surprising, the results must be understood in context.

First, Lakdawalla and Philipson define long-term care as nursing home care. But many elderly who are not disabled enough to need nursing home care might still not be able to live independently, or even if able to do so, might not be able to care for an even frailer spouse. It would thus be interesting to know whether per capita output of long-term care defined more broadly to include such arrangements as assisted living or home care also has declined.

Second, the decline in per capita long-term care risk depends substantially on the relationship between male/female ratios and marriage rates in the elderly population. Marriage rates among the elderly have been roughly stable among those ages 65 to 74 and among men over age 75. The rates have increased substantially (more than 4 percentage points) among women ages 75 and older since the period covered by Lakdawalla and Philipson's work (Table 1). These numbers appear to be good news, especially for older women.

On the other hand, it is too soon to say what baby boomers will do in old age. Many married late in life, and have experienced divorce. They might not choose to marry in old age even if improved male/female ratios make it possible. Staying single could increase their nursing home risk.

SAVINGS, CAPITAL INVESTMENT, AND RATES OF RETURN

When the ratio of active workers to retirees declines, it is reasonable to expect broader impacts in the general economy. But the magnitude and direction of these effects is not a priori clear. On

the one hand, countries with aging populations can face many of the same issues as countries with a large proportion of children: devoting a greater share of national resources to a relatively less productive segment of the population can depress economic growth by diverting income from savings and investment to transfer payments (see, for example, Bloom et al. 2001, Kotlikoff et al. 2001).

On the other hand, as the United States ages, the number of elderly wealth-holders will grow relative to the number of young workers. One consequence of this increase can be growth in the amount of capital per worker, which would increase worker productivity and real wages (Kotlikoff et al. 2001).

Two recent studies assess how population aging will affect savings, capital investment, and rates of return—and when. These analyses suggest the wide range of ways that population aging could affect macroeconomic conditions, as well as ways that investors may be able to use international differences in population aging to their benefit.

United States

Kotlikoff et al. (2001) developed an innovative dynamic general equilibrium life-cycle simulation model to study the conflicting economic forces likely to be unleashed by an aging population. Their model projected more rapid growth of labor than capital throughout the 21st century, resulting in a 4-percent real wage decline per effective unit of labor over the next 30 years. For the same period, it projected an increase of 100 basis points in the real rate of return to capital.

Later retirement, often touted as a solution to fiscal imbalances caused by an aging population, would generate more labor income, but would also reduce retirement-oriented wealth accumulation, since people would be planning for shorter retirements. This reduction would forestall improvement in real wages, they argue. The researchers predicted that only technological change will prevent the next generation of workers from experiencing absolute declines in their living standards, by increasing the effective labor supply.

Germany

Kotlikoff et al. ignored a number of economic factors that are likely to influence the economic consequences of population aging, including international financial flows. Such flows could be important because not all the world is on the same aging timetable. There are major differences in aging among major regions of the world and even among industrialized countries (Anderson and Sotir Hussey 2000, Bloom et al. 2001). Theory and empirical evidence both lead to the conclusion that international differences in demographic patterns will affect international capital flows.¹⁹ These flows will generally favor relatively younger countries, where capital is scarcer relative to labor.

Boersch-Supan et al. (2001) presented an innovative multi-country quantitative analysis of these flows for Germany. They predicted that population aging will result in a larger capital stock

¹⁹ See studies summarized in Boersch-Supan et al. (2001).

relative to labor, lowering capital returns. This reduction in returns could happen as soon as 2010 to 2026 in the absence of reform in the German pay-as-you-go public pension system.

However, the resulting decrease in capital returns will be moderated substantially by capital exports from Germany. By 2020, these exports could exceed seven percent of gross national product. Boersch-Supan et al. hypothesized that most of the exported capital would go to younger countries in the European Union or the Organization for Economic Cooperation and Development (OECD). If capital flows from older to younger countries, the United States (which is in the youngest third of OECD countries by old-age dependency ratio²⁰) would seem to be poised to benefit from these flows.

Microeconomic Evidence

The studies discussed above are based on macroeconomic models. But macroeconomic data may not reflect what is happening at the household level. Examination of household data on the elderly has generally concluded that they do not dissave significantly (see, for example, Weil 1994). Many households have accumulated significant wealth even in the face of the decline in the measured savings rate. However, the National Income and Product Accounts (NIPA) saving rate may not be useful in judging whether households are preparing for retirement or other contingencies, in part because of the way pensions are treated in the NIPA (Lusardi et al. 2001).

In short, it is likely that population aging will affect macroeconomic conditions and performance. But what will happen and when is far from clear, younger economies may be able to benefit from conditions in relatively older ones, and doomsday scenarios of an American economy weakened by the aged may not come to pass.

INCOME

Income is likely to affect the dimensions and consequences of population aging in several, possibly contradictory, ways. Income confers a protective effect against mortality and disability. However, there is some evidence that economic expansions are unhealthy, and there is a sizable amount of literature investigating the mortality implications of income inequality.

The Effect of Income on Disability and Mortality

Whether health is measured by disability or by mortality, higher socioeconomic status offers important protective effects (see, for example, Cutler 2001, Cutler and Meara 2001, Schoeni et al. 2001, Ruhm 2001). As discussed above, however, the relative importance of the direct and indirect effects of socioeconomic status is not fully understood.

In addition, various studies have found contradictory results on the relationship between health and income—or to be more precise, on the relative contributions of income and education to better health. Some studies have found that income is strongly protective of health, even after

²⁰ This calculation is based on data presented in Visco (2001) for 24 of the 30 OECD countries.

controlling for education. But more education tends to mean that people work in safer jobs and can spend more on their health (see **Long Life and Health?** above). Better-educated people also usually earn more than those with less education, however, so some argue that it is not clear whether it is income or education that protects health. Still other studies have found that after controlling for education, higher income is mildly hazardous to health.²¹ The only clear conclusion that can be drawn is that income interacts with other factors that promote better health in complex ways.

Health, Business Cycles, and Economic Growth

Economic growth, both cyclical and long-term, will also influence the dimensions and consequences of population aging. More income is typically associated with better health. However, some research suggests that the time pattern of income changes may be important—economic growth that takes place in a relatively smooth fashion could have different long-term effects than growth that occurs in the form of disruptive business cycles.

Health and the business cycle. Ruhm (2001) provides evidence that economic expansions—measured as a decline in unemployment—are associated with deterioration in a number of measures of physical health, including medical problems, ailments, and “bed-days.” Acute medical problems are more likely to increase during an economic expansion than are chronic problems. In contrast, the incidence of non-psychotic mental disorders declines when the economy improves.

There may be several reasons why physical health could decline when the economy improves. Working, or working longer hours, may leave people with less time for healthy behaviors such as exercise or attention to diet. Health may suffer if people work longer hours or are under greater pressure, particularly in cyclically sensitive industries where it is understood that the good times will not last. Finally, good times may lead people to increase risky behaviors such as drinking and driving or participating in dangerous sports.

This deterioration in health during economic expansions appears to be real. It is stronger among workers than among nonworkers. Workers are more likely to have health care coverage than nonworkers, and most health care coverage in the United States is employment-based. Therefore, Ruhm argues, this deterioration does not appear to reflect improved identification of already-existing problems due to higher income or better health care coverage or access. In other words, health care coverage expansion related to the business cycle does not appear to offset the detrimental effects of economic upturns on health.

Ruhm concludes, however, “...the negative effects of economic expansions result from some combination of greater time costs for making health-preserving investments and increases in job-related medical problems but not from higher income.” Rather, his analysis shows that higher income during a temporary economic upturn tends to have a protective effect on health.

Health and economic growth. Temporary economic expansions may worsen health, but long-term economic growth need not have the same effect. Over the longer term, consumers can

²¹ See results and literature reviewed in Deaton and Lubotsky (2001).

change their behaviors and employers can change work place conditions in ways that eliminate the dangers to health and even enhance it (Ruhm 2001).

However, economic growth and development may increase, not reduce, certain health hazards. For example, obesity has increased in developed countries despite more dieting and recreational exercise. Philipson and Posner (1999) explained this paradox as a byproduct of technological progress. Technology has lowered the cost of food, but by reducing the expenditure of calories required both in the workplace and in the home, has increased the cost of expending calories. At one time people may have been able to maintain healthy weight by working and keeping up their households, but today they may need to set aside time, money, or both for exercise.

Since technological progress increases income, however, Philipson and Posner contended that the obesity epidemic could be self-limiting. Thinness is an attractive and valued attribute. Therefore, they argued, at some point the thinness-promoting effects of income growth will overtake the obesity-promoting effects of technological progress. Indeed, they cited research showing that obesity does fall with rising income and education in wealthier countries.

Positing a high income elasticity of demand for thinness has the interesting result of framing obesity and its related health hazards as economic questions rather than questions of medical care or public health education. However, overweight U.S. adults came to outnumber those of healthy weight over roughly the last quarter-century (although whether this resulted despite or due to continued economic growth is not clear). Therefore, even if Philipson and Posner's assessment of the economics of obesity is valid, there may simply not be enough time for income growth alone to save today's overweight adults from unhealthy retirement or early death

Mortality and Income Inequality

Another hazard today's adults may have to face before they can survive long enough to contribute to an aging crisis is income inequality. It has been hypothesized that individuals are less healthy, and die sooner, where income is less equally distributed. The relationship between health and income inequality has become a fact that "everyone" knows—or thinks they do. For example, an Internet search on "health and income inequality" yielded over 169,000 hits.

Income inequality affects mortality, it is argued, because more egalitarian countries are more socially cohesive (Wilkinson 1999). Social cohesion, in turn—or its lack—may indicate underlying psychosocial risk factors that are known to be closely associated with health. There seems to be a particularly close relationship between income inequality and causes of death related to accidents, alcohol, and violence—all of which may be reflections of the social fabric of society. Individual, area, cross-country, and time-series data have all been used to support this hypothesis.²²

Whether there is a relationship between health status and income inequality is important to Americans. Wage and earnings inequality increased substantially in the United States during the 1970s and 1980s, and has not abated since that time (Levy and Murnane 1992, Gottschalk and

²² Deaton (2001) summarizes this debate.

Smeeding 1997). If income inequality is a hazard to health and survival, therefore, it can determine who is most likely to enjoy a longer and healthier life.

Yet the evidence underlying this hypothesis is controversial. Deaton and Lubotsky (2001) review a series of studies that have failed to find a connection between health and income inequality, and argue that the connection between income inequality and mortality is spurious. They find that, after controlling for the fraction of the population that is black, there is no relationship between income inequality and mortality across either states or cities. These results reflect not only the fact that black mortality is typically higher, but also the fact that white mortality is higher in places where a larger percentage of the population is black. The fraction of the population that is black influences mortality even after controlling for a wide range of factors. It is important within as well as across regions (excluding the possibility that this relationship is a Southern phenomenon), for all age groups, and for both genders (except for boys ages one to nine). Deaton and Lubotsky are unable to explain why racial heterogeneity should be unhealthy, although they do explore and rule out several possible explanations, including education and health care provision.

To summarize, income levels and economic growth probably affect the dimensions and consequences of population aging in ways that are not fully understood. Cyclical changes in the economy may affect physical health adversely, while both short- and long-term economic growth generally improves health status and lowers mortality rates. However, income inequality by itself does not appear to affect health status and mortality.

LESSONS FROM ABROAD—AND AT HOME

As the U.S. population gets older, it is not venturing into entirely unknown territory. The share of the American population over age 65 in 2020 will be roughly comparable to the share already in that age group in Japan, Germany, France, and the United Kingdom in 2000 (Anderson and Sotir Hussey 2000).

What “Older” Countries Can Show Us

Based on an analysis of eight industrialized countries,²³ Anderson and Sotir Hussey (2000) feel that the United States is well positioned to cope with population aging. Next to Japan, for example, the United States has the highest workforce participation among the elderly and the highest average age of retirement. These factors increase the elderly’s economic contribution.

One of this country’s strengths as it confronts population aging is that retirees typically derive their incomes from a mix of public and private sources. However, gaps in private pension coverage and inadequate individual savings will increase income inequality among the elderly. In addition, Anderson and Sotir Hussey find that the United States has important gaps in the financing of prescription drug coverage and long-term care compared with the other countries considered, and these gaps could become more disruptive and costly as they impact a larger share of the population.

²³ Australia, Canada, France, Germany, Japan, New Zealand, United Kingdom, and United States.

International Comparisons Of Aging And Public Spending

Gruber and Wise (2001) examined some of the distributional and fiscal effects of population aging in a group of otherwise similar OECD nations.²⁴ They found that public spending on the elderly did little to raise their average incomes, possibly because higher spending resulted in earlier retirement. However, this spending significantly protected the elderly against poverty.

Gruber and Wise also found that population aging led to significant increases in transfers to the elderly. Based on past trends in the countries studied, they projected that population aging over the next 50 years will increase average transfers to the elderly by almost 40 percent, to more than 11 percent of GDP on average. They found that population aging did increase health spending. However, there was little relationship between within-country changes in the elderly population on the one hand, and total spending on transfers to the elderly, on those to the non-elderly, and on health on the other. They concluded from this that increased spending on the elderly in these countries has been paid for at least in part by reductions in transfer spending on other age groups.

Learning from Ourselves

International lessons responding to population aging can be difficult to apply due to institutional, political, and other differences among countries. But even the United States does not seem to be homogeneous in its response to population aging.

It has long been known, for example, that Medicare outlays per enrollee vary widely by county (Wennberg et al. 1999). Even after adjusting for intercounty differences in the elderly's age and gender composition and health status, along with differences in medical practice costs, Medicare outlays per enrollee vary by a factor of *two or more* across counties. Understanding whether this variation makes any difference to the health care or well being of the elderly could be useful in devising equitable and efficient responses to the increased expenditure needs likely to accompany population aging (Reinhardt 2000).

Evidence on health care costs from both other countries and within the United States thus seems consistent with evidence presented earlier in this report about the improved health status of older Americans. An aging population need not cost increasingly more in health care spending. Age may really be “just a number”—and without a dollar sign in front of it.

RETIREMENT INCOME: WILL IT BE ENOUGH?

Whether Americans live long and well will influence the adequacy of their retirement incomes, and thus should be considered by both the sponsors and the regulators of pension plans. The research reviewed in this report suggests that retirement could hold some surprises, especially for middle- and upper-income workers. Indeed, patterns emerging from recent research suggest that retirement, not death, could be “the great equalizer.” This discussion is only speculative, however, and much research is needed to quantify the potential importance of these effects.

²⁴ Belgium, Canada, France, Germany, Italy, Japan, Netherlands, Spain, Sweden, United Kingdom, and United States.

Future retirees may spend longer in retirement than previous generations, but may not have the additional income they will need to do so comfortably. Benefits in employer-sponsored plans can be vulnerable to longevity in two ways: employees who depend primarily on defined contribution plans may outlive their resources, while those depending primarily on defined benefit plans could find that their incomes decline in real value.

Outliving Retirement Savings

Current workers could be in greater danger of outliving their retirement savings than their parents were because they are more likely to be covered by defined contribution retirement plans. The baby boom generation will be among the first retirees to derive all or most of their private pension income (if any) from defined contribution plans. In 1977, there were more than two active participants in private sector defined benefit plans for every individual in a defined contribution plan (U.S. Department of Labor 2001).²⁵ By 1984, defined benefit plans held an edge of one percent. In every year since 1985, the number of defined contribution plan participants has exceeded those in defined benefit plans. By 1997, there were 1.34 defined contribution plan participants for each one in a defined benefit plan.

Defined contribution plans are often optional from the employees' point of view, are not designed to replace a specific proportion of pre-retirement income, and typically do not pay out benefits in annuity form. Workers thus risk not accumulating enough to replace their pre-retirement income (by not participating, not contributing enough, or investing too conservatively), or spending their money too quickly when they do retire.

Poterba et al. (2001) argued that the increase in defined contribution plan assets over the last two decades is "enormous," dwarfing any potential displacement of defined benefit plan assets. If this were true, workers with defined contribution plans would seem to be well protected against even an unexpectedly long retirement.

However, Mitchell (2001) takes the possibility of outliving one's assets seriously. She systematically looked at the issue of decumulation of assets in retirement, and found that annuity products have an important role in this process. She argued that public policies can improve the performance of annuity markets and that inflation-indexed annuities and related products can have an important role in protecting the real value of retirees' consumption streams.

Mitchell also advocated further work on how people can make better-informed decisions about retirement decumulation. Most retirement income education programs sponsored by employers focus on how to accumulate enough for a secure retirement, primarily through appropriate contribution and investment decisions. As the population ages, these programs should also include information on making retirement income last. This information should consider selecting annuity products; financial asset management, real estate financing, and gift and estate

²⁵ These data are based on the IRS Form 5500 reports and therefore do not take account of the fact that some workers may participate in more than one plan, either simultaneously or sequentially over the course of their employment careers.

planning; incorporating long-term care into a financial plan; and, just simply, how to spend your income in retirement.

Declining Real Value of Retirement Benefits

One consequence of increasing longevity is that the real value of benefits in a defined benefit plan could drop over the course of a long retirement. Three percent of participants in private defined benefit plans and 55 percent of those in state and local government defined benefit plans are in plans offering automatic post-retirement cost-of-living increases (BLS 1999, 2000). However, even these increases are typically equal to only a fraction of the increase in the cost-of-living index on which they are based. An additional number of participants are in plans that offer ad hoc or discretionary benefit increases. As the pool of retirees grows, such benefit increases could become more costly and thus may become smaller or be granted less frequently.

Longevity may pose greater financial dangers to middle- and upper-income Americans than to those in lower-income groups. Social Security benefits, which constitute the foundation of retirement income for most retirees, replace a higher proportion of pre-retirement earnings for lower-income than for middle- and higher-income workers. Retirees who get all or most of their retirement income from Social Security will have inflation-protected income that lasts as long as they live. Middle- and upper-income workers, in contrast, can expect to live longer, and will depend on employer-sponsored pension plans for a greater share of their retirement income than households at the lower end of the income scale.

The paradox thus is that lower-income groups face less financial risk from unexpectedly long retirements than those in the middle- and upper-income groups do. Many observers will be less sympathetic to the retiree who enters retirement affluent and ends it destitute than to the retiree who spends all of his or her retirement living modestly. But affluent people—and those formerly so—tend to be vocal and able to make society listen to their needs. It is thus in everyone's interest to make sure that those who could be responsible for making their retirement incomes last an unexpectedly long time are schooled in how to do so.

Income Adequacy and Spending Needs in Retirement

Retirement income adequacy and spending needs are flip sides of the same coin. Although greater longevity would seem to pose a greater financial risk to better-off households, it could be balanced, at least in part, by the favorable financial effects of better health in retirement. Better health means lower spending for medical care and long-term care.

Better health would seem to benefit middle- and upper-income households relatively more than those at the lower end of the income distribution, for at least two reasons. First, income protects health and reduces mortality, so better-off households can gain more disability-free years than their lower-income counterparts. Second, better-off households have to cover more of their own health expenses, especially for long-term care, in the first place. Poorer households may face more years of disability than those that are better off, but can expect more assistance with long-term care expenses from Medicaid than more affluent households.

CONCLUSIONS AND POLICY IMPLICATIONS

This report has reviewed recent research that bears directly or indirectly on the likely dimensions and consequences of population aging. The literature suggests that the dimensions of population aging for the United States are by no means certain, and that policy choices are available for mitigating those consequences.

Although the future is certainly not clear, recent research does suggest what will matter as the United States and other countries devise policies for dealing with population aging.

Health and Mortality

Most people want more than just years—they want healthy years. A healthy elderly population is also good for policymakers, as it requires fewer hard choices and reallocations of public spending. Today's elderly are healthier than even in the recent past, but disabilities are increasingly prevalent among adults well short of retirement. Increased disabilities—many due to obesity—among today's working-age adults could make it hard for them to achieve the long and healthy retirements their parents are having.

On the other hand, improvements in public health and safety among younger adults can keep them healthier and more productive as they age. Every workplace or road accident avoided can be a long-term, career-ending, disability averted. Expanded coverage for health care and long-term care can also make population aging easier.

Income

People at different points in the income distribution have benefited differently from the health improvements and disability declines of recent decades. People with higher incomes tend to have safer jobs and healthier habits, for example. But to the extent that behavior affects health, public education is one way that these advantages can be spread more broadly. People need to understand, long before retirement, that squandering their health can be as serious as squandering their paycheck.

Retirement Planning

A longer life can mean a greater chance of outliving one's retirement savings. People with no private pension assets—or those with “enough”—may not have to worry about this problem, but without knowing how long one will live, it is hard to know what is “enough.”

Policymakers and employers are already concerned about educating retirement plan participants on how to accumulate retirement assets and make them grow. As the population ages, employers and policymakers may also have to take responsibility for educating workers about how to make their assets last.

On one level, this task may not be more difficult than educating homebuyers about how to shop for affordable homes and mortgages. However, some homeowners do lose their homes due to economic adversity or poor financial planning. For many, this is a temporary setback that can be redressed over the remaining course of their working careers. For retirement income mistakes, in contrast, there may be fewer second chances. Workers who face the prospect of exhausting their retirement savings may have to work longer before retiring from their career jobs, may need to return to work after retirement, or may have to scale down their expectations about their post-retirement living standards.

Research also suggests that macroeconomic policy is an important way to plan for an aging population. Macroeconomic stability and growth expand employment opportunities, make it easier to plan for retirement safely, and may even make it easier for workers to survive to retirement and beyond.

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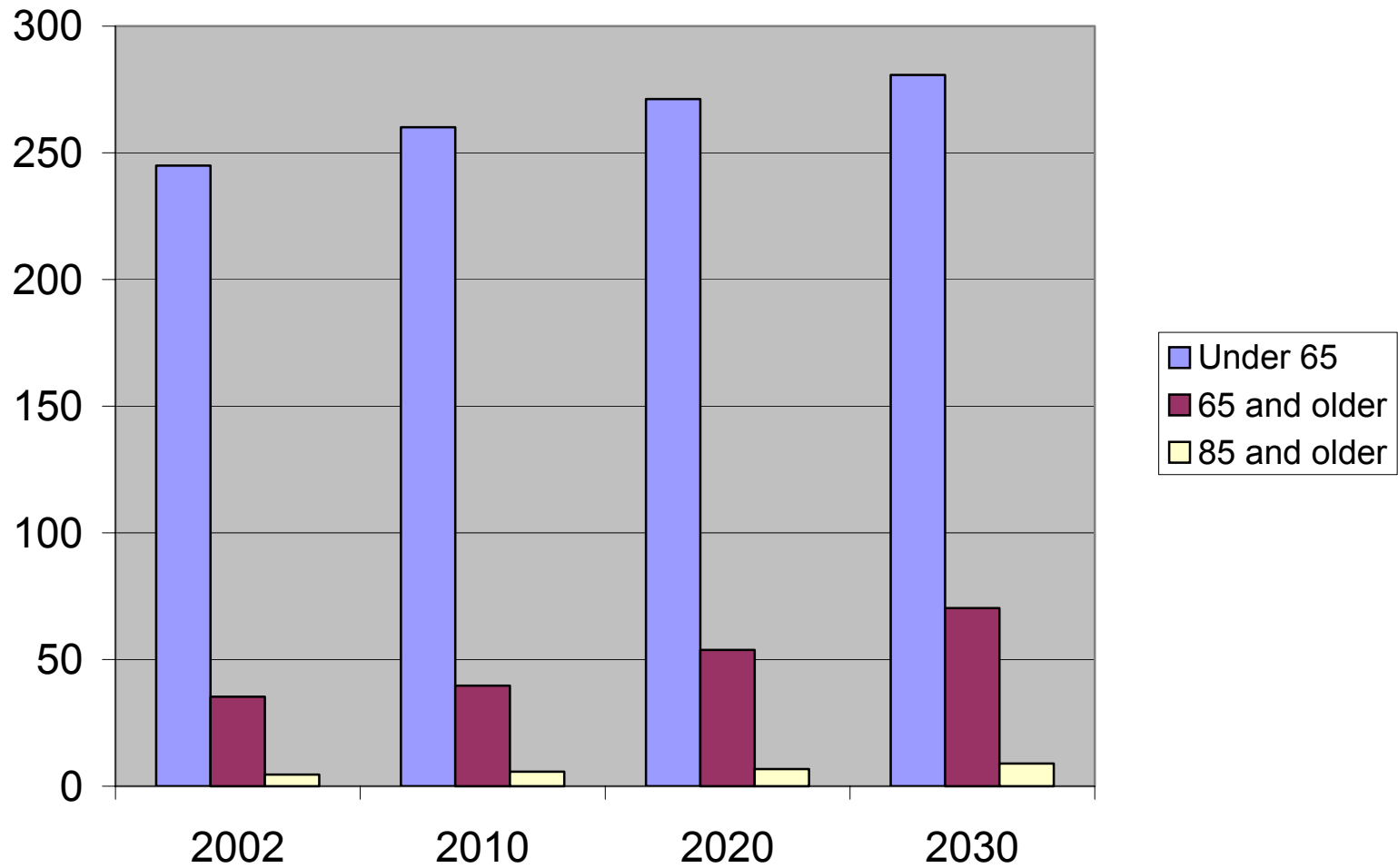
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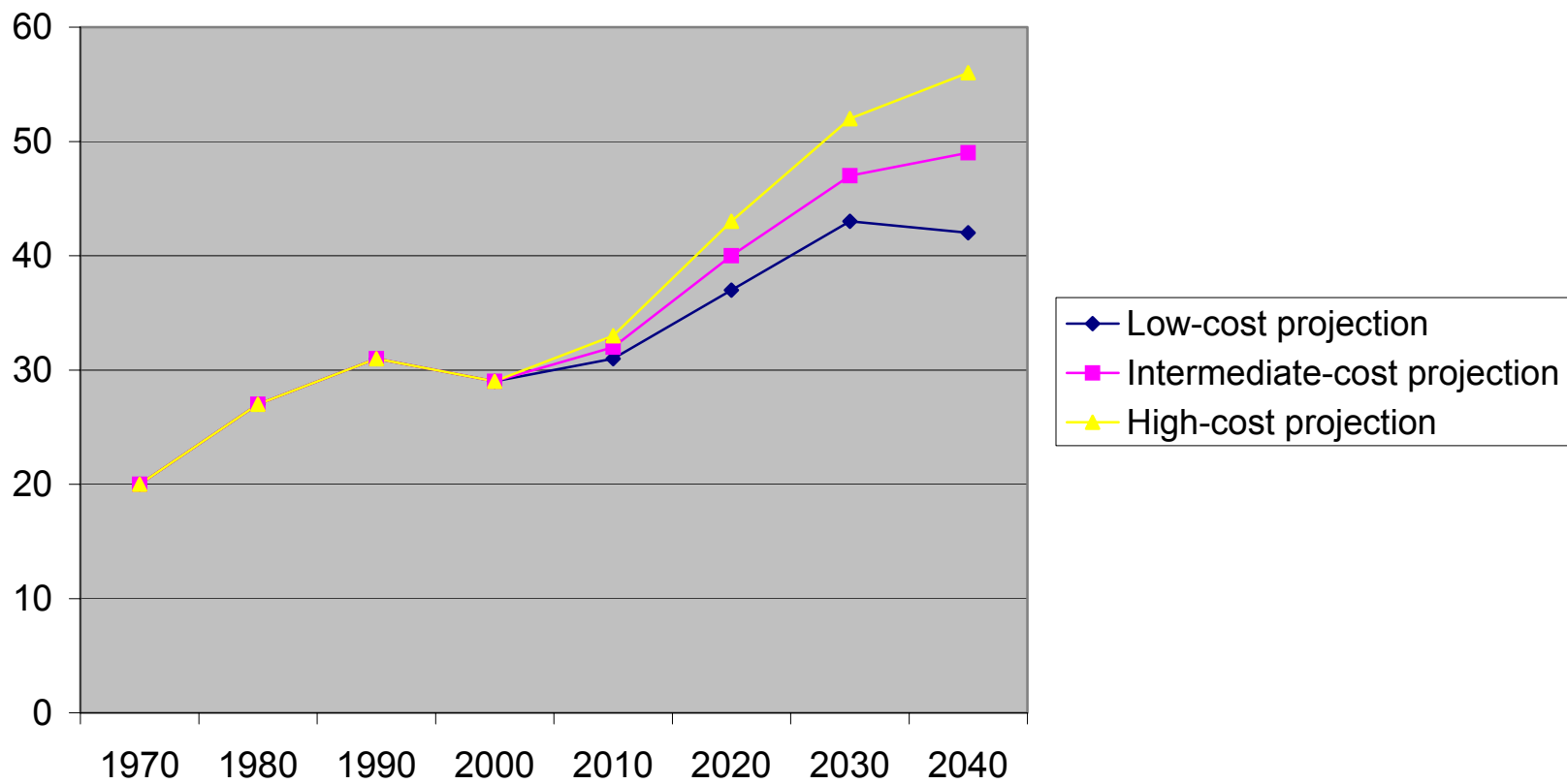
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Figure 1. U.S. Population by Age, 2002-2030 (in millions)



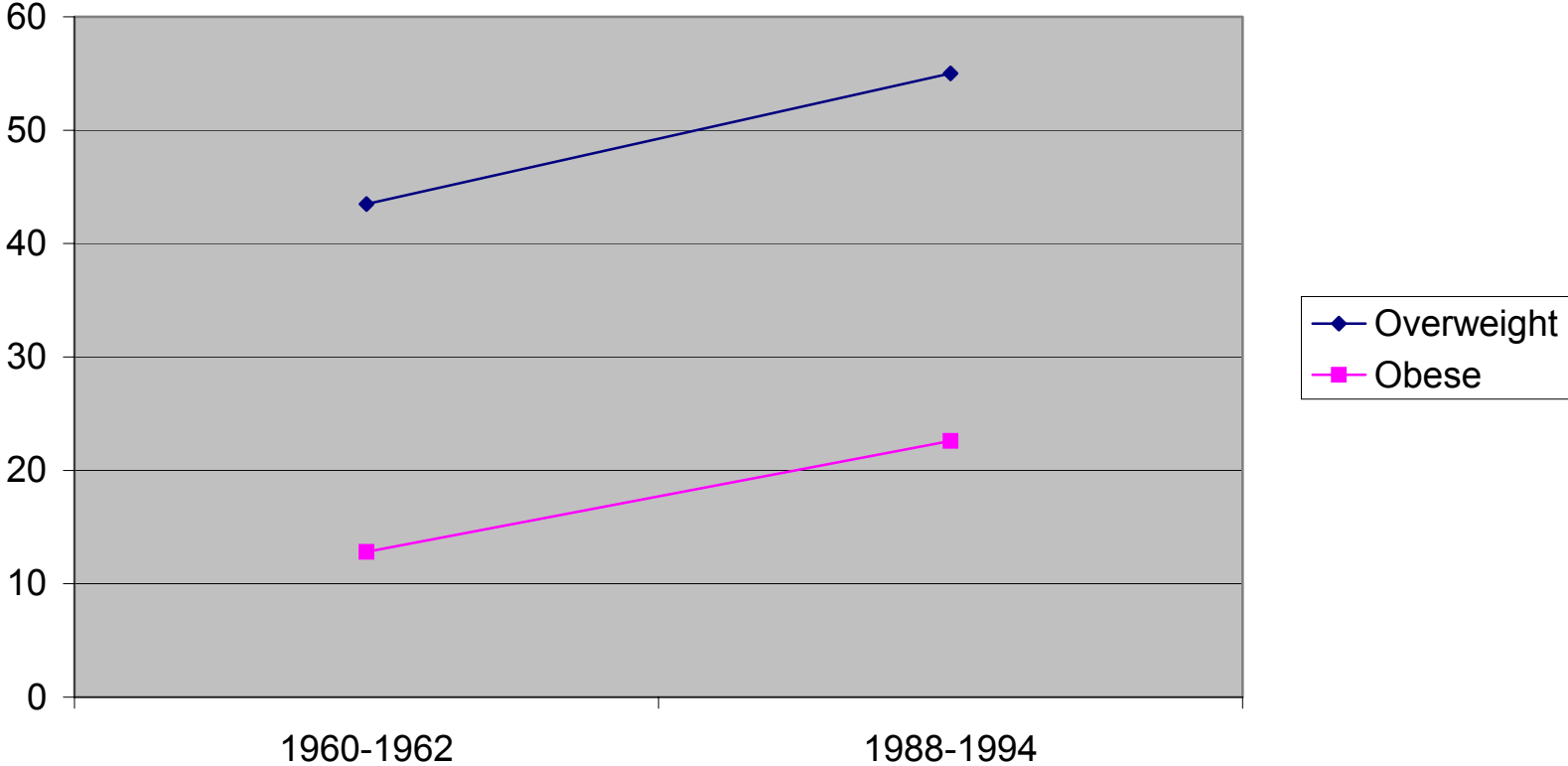
Source: U.S. Bureau of the Census (2002).

Figure 2. Number of OASDI Beneficiaries Per 100 Covered Workers, 1970-2040



Source: U.S. Social Security Administration (2002).

Figure 3. Overweight and Obesity Among Adults Ages 20 to 74, Selected Years (in percents)



Source: Author's tabulation based on U.S. Centers for Disease Control (2000).

Table 1. Marriage Rates Among the Elderly by Age and Gender, 1995 and 2000 (in percents).

Age	1995		2000	
	Men	Women	Men	Women
65 to 74 years old	80.9	55.1	79.6	55.6
75 years old and older	70.8	27.0	69.3	31.1

Source: U.S. Bureau of the Census (1996, 2001a).