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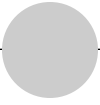
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# Introduction

David A. Wise and Richard Woodbury

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This volume marks thirty years since the inception of the NBER program on aging. When the program began, the baby boom generation was in their twenties and thirties, and life expectancy at older ages was nearly three years shorter than it is today. The program was created with a forward-thinking orientation, drawing together economists from multiple subfields of the profession to consider together what would become one of the most important demographic, social, and economic transitions of the twenty-first century. The underlying focus of the program is to study the health and financial well-being of people as they age, and of a population that is increasingly composed of older people.

This is the sixteenth in a series of NBER volumes that highlight economics of aging research. The previous volumes are *The Economics of Aging*, *Issues in the Economics of Aging*, *Topics in the Economics of Aging*, *Studies in the Economics of Aging*, *Advances in the Economics of Aging*, *Inquiries in the Economics of Aging*, *Frontiers in the Economics of Aging*, *Themes in the Economics of Aging*, *Perspectives on the Economics of Aging*, *Analyses in the Economics of Aging*, *Developments in the Economics of Aging*, *Research Findings in the Economics of Aging*, *Explorations in the Economics of Aging*, *Investigations in the Economics of Aging*, and *Discoveries in the Economics of Aging*.

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The demographic backdrop to the research in this volume is substantially different from when the program began thirty years ago. Today, the leading edge of the baby boom generation is entering their seventies. Many are retiring from paid work, yet they are living longer than ever. Their health and financial well-being are shaped by individual decisions people made through the life course, as well as by unanticipated events, economic conditions, medical innovations, and a rapidly evolving landscape of policy incentives and supports. What is most apparent from the mass of research conducted through the program over the years is how integrally related are the multiple dimensions of people's well-being.

As we confront the demographic challenges of a substantially larger population of older people, opportunity lies in three sets of trends, all of which are a focus of continuing research. First, saving in 401(k) and similar plans is now a mainstream aspect of retirement preparation. Though large parts of the population appear to save too little, and access to employment-based saving programs is far from universal, a policy foundation for the accumulation of personal retirement resources is in place, and financial preparation can be improved through saving-related interventions. Second, many, though not all, measures of health are improving, and these improvements can be accelerated through health-related interventions. Third, some of the bounty of longer and healthier lives can reasonably be allocated to prolonging the labor force participation of older workers, among those who are able, helping to pay for higher social security and health care costs, and moderating the macroeconomic challenges we collectively face. But whether people work or retire at one age or another depends significantly on how we structure our public policies and work environments. Each of these issues is being considered in ongoing program research.

The current volume is organized in three sections, corresponding to three aspects of well-being: financial, physical, and emotional. The first four chapters look at factors relating to people's financial circumstances in later life, such as saving, home ownership, and the use of accumulated assets in retirement. Chapter 1 analyzes the effects of pension cash-out at job change on people's long-term financial balance sheets. Chapter 2 considers the trade-offs between allowing liquidity in retirement savings systems versus penalizing preretirement withdrawals. Chapter 3 looks at the implications of housing price risk in influencing people's investments in housing as a financial asset. Chapter 4 is a retrospective analysis of asset holdings and pathways at older ages, looking back from a date near the end of life.

The next five chapters in the volume focus on health and disability. Chapter 5 considers the factors underlying the improvements in disability-free life expectancy in the elderly population. Chapter 6 looks at racial differences in mortality following heart attacks, what causes these differences, and how they are changing. Chapter 7 is a methodological study of the difficulties in measuring disease prevalence in different kinds of data. Chapter 8

analyzes Medicare spending among patients with highly complex combinations of medical conditions. Chapter 9 assesses the impact and pitfalls of a major health intervention experiment in reducing anemia in a very poor region of the world.

The last two chapters in the volume explore issues in mental health, emotional well-being, life satisfaction, or happiness. Chapter 10 focuses specifically on suicide, and the degree to which suicide relates to other measures of physical and mental health. Chapter 11 asks whether retirement makes people more or less happy with their lives.

As with previous volumes, the collection of studies is not intended to cover economics of aging research in a broad or comprehensive way, but rather to highlight selected investigations that are at the cutting edge of the field. Many of the studies are components of longer-term research themes of the NBER program on aging. Through these sixteen volumes, the large majority of this research has been funded by the National Institute on Aging, which has made a long-term commitment to advancing the economics of aging field.

The remainder of this introduction provides an overview of the studies contained in the volume, relying to a significant extent on the authors' own language to summarize their work.

### **Financial Well-Being**

Certainly one aspect of well-being at older ages is financial. Among the resources potentially available to support people in their later years are Social Security, employer-provided pension benefits, financial asset savings, housing wealth, and earnings. Of course the amount and distribution of financial support from these various resource categories varies significantly across households, with a significant number of households relying on Social Security almost entirely.

Notwithstanding the wide variability in financial circumstances across households, one significant trend of the last two decades is the emergence of retirement saving accounts, and particularly employer-sponsored 401(k) plans, as a mainstream component of financial preparation for retirement. How much people save in these plans, however, and how much they withdraw from their accounts before retirement depend on a multitude of factors, including the tax treatment of the plans, employer-matching provisions, plan enrollment protocols, default saving rates, investment allocations, management fees, loan provisions, and early withdrawal penalties. Chapters 1 and 2 consider the particular options, prevalence, and implications of pre-retirement withdrawals.

In chapter 1, Philip Armour, Michael D. Hurd, and Susann Rohwedder explore "Trends in Pension Cash-Out at Job Change and the Effects on Long-Term Outcomes." Federal tax rules discourage such pension cash-

outs, notably by imposing a 10 percent tax penalty on preretirement withdrawals, but the limited evidence available suggests the practice is common. The study reported in chapter 1 takes advantage of long-term longitudinal data in the Health and Retirement Study to update prior findings on pension cash-out behavior, investigate cohort differences, and study the long-term consequences of cash-outs for household finances.

The authors find that pension cash-out is more concentrated among workers who experience economic or health shocks around the time of job separation. The events most likely to trigger cash-outs are issues with mortgages; in particular, over half of those who fell behind on their mortgage cashed out pension accounts. Health was another important factor: more than one-third of those losing their health insurance at job separation engaged in cash-outs, and only a quarter of those whose health worsened did so.

Comparing cash-out behavior across cohorts, the most recent cohort of older workers more often cashed out pension balances and more frequently used the balances for spending or to pay off debt. This is likely due to most of the job separations for this cohort occurring during or in the aftermath of the Great Recession, which brought about economic shocks at higher frequency.

Long-term outcomes for those who cashed out pension balances are worse than for those who did not cash out, but so were their baseline characteristics. Taking this together with the fact that outcomes are largely similar across populations of workers with or without access to pension cash-out, the authors conclude that the worse financial outcomes of workers who cashed out are due to the experience of shocks leading to cash-out behavior rather than due to their having access to the cash-out option.

In a related study reported in chapter 2, John Beshears, James J. Choi, Joshua Hurwitz, David Laibson, and Brigitte C. Madrian consider “Liquidity in Retirement Savings Systems: An International Comparison.” Moving beyond the United States experience, this study compares the policy provisions imposed in several different countries, as they relate to preretirement withdrawals. The positive side of greater liquidity, they suggest, is that it allows people to flexibly respond to unexpected preretirement events, such as temporary job loss or medical expenses. The negative side of liquidity is the risk that too much money is withdrawn from the plans and too little saved, particularly if people are subject to self-control problems or planning mistakes.

The six countries analyzed in chapter 2 fall into three groups. Germany, Singapore, and the United Kingdom have the most illiquid systems. In these countries, withdrawals for general consumption in employer-based defined-contribution (DC) plans are banned no matter the level of transitory income.

In Canada and Australia, liquidity in employer-based DC plans is income

related. For Canadian households that normally earn US\$60,000, for example, DC accounts are completely illiquid unless annual income falls substantially. But for those households that temporarily have very low income, the incentive reverses. In these adverse circumstances, there are actually strong incentives for households to withdraw their DC balances. Hence, the Canadian DC system has the intuitively appealing property that, for a typical household, DC withdrawals are barred when income is near its normal level, but are encouraged when income declines substantially.

The United States stands alone in allowing a high degree of liquidity in its DC system, regardless of income. Penalties for early withdrawals are relatively low (the 10 percent tax penalty), even at normal levels of income, and early withdrawals are slightly subsidized (through lower marginal tax rates) as income falls transitorily. According to the authors, this liquidity generates significant preretirement “leakage” in the United States: for every \$1 contributed to the DC accounts of savers under age fifty-five (not counting rollovers), \$0.40 simultaneously flows out of the DC system (not counting loans or rollovers).

Chapter 3, by James Banks, Richard Blundell, Zoë Oldfield, and James P. Smith, looks at investments in home equity, focusing on “House Price Volatility and the Housing Ladder.” One of the most critical consumption and investment decisions that individuals and families make over their life cycle involves the amount of housing services to consume and whether or not to combine consumption with ownership. Housing is an important component of consumption, both as a large fraction of the household budget and a key ingredient in defining one’s lifestyle. But housing, or more particularly housing wealth, can be even more critical as an investment as it is the biggest marketable asset of most households.

The contribution of this chapter is to bring together two key elements of housing consumption and home ownership decisions into an empirical model of housing purchases. The first of these is the housing ladder. Rather than modeling home ownership as a one-time durable purchase, the study models it as a series of purchase decisions, or a housing ladder, where the desired flow of housing services rises with family formation and growing family size over the life cycle. The second is house price risk. In some geographic markets, housing can be a risky asset with unpredictable price volatility, while in other places the market is more stable.

The study analyzes the role of home ownership as a form of insurance against future house price risk as individuals move up the ladder. Both their modeling and empirical findings suggest that in a market with more house price risk, there is an incentive to become a homeowner earlier and, once an owner, to move more rapidly up the housing ladder. The study uses micro-data from both the United States and the United Kingdom, and the results are consistent with theory, both across and within the two countries.

In chapter 4, James M. Poterba, Steven F. Venti, and David A. Wise con-

sider “What Determines End-of-Life Assets? A Retrospective View.” Many individuals reach the end of life with limited financial assets. The study explores the determinants of asset balances at death by following respondents in the Health and Retirement Study (HRS) “backward” from the last wave prior to their death to the first wave in which they were observed.

Because the prevalence of low wealth among those near the end of life is of particular interest, we begin by describing several potential pathways that can lead a household to have very little wealth in old age. One is by entering retirement with certain assets, and then experiencing unanticipated events that drain financial resources such as widowhood or divorce, an acute health event, the onset of a chronic illness, or a general decline in health. A second pathway to having low assets at the end of life is to enter retirement with assets, but to “outlive” them. A third pathway is simply failing to save adequately before retirement. Our aim is to determine which of these three alternative pathways is most consistent with observed asset trajectories late in life.

In our descriptive analysis, we find little difference between median assets in the first year observed and median assets in the last year observed. For the younger (HRS) cohort, 70 percent of the persons that had less than \$50,000 in total assets when last surveyed before death also had fewer than \$50,000 in assets when first surveyed. For the older (AHEAD) cohort, 52 percent of the persons that had less than \$50,000 in assets when last surveyed before death also had fewer than \$50,000 in assets when first surveyed. Low levels of both housing and financial assets are also persistent. Most of those who had substantial assets at the end of life also had substantial asset balances when first observed. The persistence of wealth is confirmed in a series of figures showing median total assets in each survey wave between the wave first observed and the last wave observed before death.

Our regression estimates and simulations reinforce this core finding that in the absence of change in family composition or health status, asset trajectories are relatively flat. However, many people do exhibit asset declines in connection with important medical events or disruptions in family composition. In addition, changes in assets between first and last year observed is strongly, and negatively, related to the respondent’s education level. Those with more education exhibit slower asset declines.

### **Health and Disability**

No aspect of well-being is more fundamental than health. As people live longer, it is important whether those increased years of life are characterized by poor health and functional disability, or by good health and functional independence. Health also affects one’s ability to work at older ages, and is strongly associated with financial well-being. Health also has societal implications for labor markets, government finances, and health

care costs. The second section of the volume explores some of the trends and determinants of health, and how health might be improved through medicine or public health interventions.

Chapter 5, by Michael Chernew, David M. Cutler, Kaushik Ghosh, and Mary Beth Landrum is on “Understanding the Improvement in Disability-Free Life Expectancy in the US Elderly Population.” Data on life expectancy is easy to obtain, but data on healthy life expectancy is more difficult. To a great extent, this is because there is no single measure of good or bad health commonly accepted in the literature. In a predecessor to this investigation, and in much of the literature, there is a focus on disabled and nondisabled life expectancy. The predecessor study, for example, shows that between 1992 and 2005, life expectancy increased by 0.7 years while disability-free life expectancy increased by 1.6 years. Thus disabled life expectancy fell by 0.9 years. However, little research has examined why disability-free life expectancy has increased so greatly, and in particular what role medical advances may have played in this.

The study in chapter 5 addresses these issues in three ways. First, the authors calculate disabled and disability-free life expectancy for a longer period of time than has been done previously. This by itself does not change the conclusions materially, but the additional three years does encompass an era of relatively low growth in medical spending, so it is important to note that even with slow medical care cost increases, disability-free life expectancy kept increasing.

Second, the chapter examines which medical conditions are associated with the greatest additions to disability-free life expectancy. The investigators decompose both mortality and disability into fifteen medical conditions, ranging from acute but recoverable diseases such as heart disease and vision impairment, to chronic degenerative conditions such as Alzheimer’s disease and Parkinson’s disease, and to chronic but nonfatal conditions such as arthritis and diabetes. The central finding is that the vast bulk of the increase in disability-free life expectancy is accounted for by improvements in acute, recoverable conditions, and two in particular: heart disease and vision problems. An estimated 85 percent of the improvement in disability-free life expectancy is attributed to these two conditions.

Third, the chapter considers how much improvements in medical care have contributed to the health improvements associated with heart disease and vision problems. This analysis is the most speculative, but the results suggest that treatment changes are responsible for about half of the overall health improvements observed. Most of the treatment improvements for heart disease are pharmaceutical—cholesterol-lowering agents and anti-hypertensives are the major ones, but some are surgical as well. In the case of vision, the study focuses primarily on increased use of cataract surgery, and finds significant benefits of cataract surgery on both vision and disability trends. People who receive cataract surgery are less likely to experience



adverse disability trends than people who do not receive cataract surgery, controlling for the prior year's level of vision impairment.

Chapter 6, by Amitabh Chandra, Tyler Hoppenfeld, and Jonathan Skinner asks "Are Black-White Mortality Rates Converging? Acute Myocardial Infarction in the United States, 1993–2010." There is a vast literature documenting racial disparities in US health care. Some of the literature focuses on how physicians treat patients of different races and ethnicities. A much different source of health disparities arises from the fact that black and white patients go to different providers. One study, for example, documented that nearly half of all black acute myocardial infarction (AMI) patients were admitted to 571 hospitals serving just 7 percent of white AMI patients (see reference in chapter 6). Moreover, the authors estimated that most of the gap between black and white ninety-day mortality was the consequence of the quality of the hospital to which the patient was admitted, and not because of how black and white patients were treated within the hospital.

Chapter 6 explores two trends related to these past findings. First, to what extent (if at all) are the racial differences in which hospitals patients choose converging over time? And second, are differences in the quality of hospitals converging so that provider choice is less relevant to health outcomes? The chapter explores these questions by analyzing hospital admissions for acute myocardial infarction, or AMI, using a sample of more than four million patients.

The study first explores trends in the ninety-day mortality rates of black and white patients with an AMI diagnosis. From 1993 to 1998, black AMI patients experienced risk-adjusted mortality rates 0.4 percentage points greater than white AMI patients, increasing to a gap of 1.6 percentage points from 1999 to 2005, and then attenuating to a gap of 1.0 percentage points from 2006 to 2010. The authors then try to decompose the sources of the gap into "within hospital" and "between hospital" racial variations.

Of the overall racial disparity in risk-adjusted outcomes, the study finds that most was the consequence of "between" hospital differences in quality; black patients were admitted to lower-quality hospitals (where quality was measured by risk-adjusted outcomes for white patients), and these between-hospital disparities have shown little evidence of convergence. At the same time, the "within-hospital" disparities have been growing, not declining. In sum, the study does not find evidence that black patients have sorted or migrated to higher-quality hospitals, or that racial differences in treatment within hospitals have converged.

The authors emphasize that black and white AMI patients going to different hospitals is, in many respects, the consequence of racial segregation in where people live and not a systematic effort to discriminate against black AMI patients. Of greater interest is segmentation of markets not driven by distance alone; for example, black patients who are admitted to lower-

quality hospitals when there are higher-quality hospitals nearby. Studying these more granular travel patterns is a topic for future research.

Chapter 7, by Florian Heiss, Daniel McFadden, Joachim Winter, Amelie Wuppermann, and Yaoyao Zhu, is on “Measuring Disease Prevalence in Surveys: A Comparison of Diabetes Self-Reports, Biomarkers, and Linked Insurance Claims.” Much of the existing literature on the health-wealth nexus relies on survey data, such as self-reported survey data in the Health and Retirement Study (HRS). Such survey data typically contain self-reported measures of disease prevalence, which are known to suffer from reporting error. Two more recent developments—the collection of biomarkers and the linkage with data from administrative sources such as insurance claims—promise more reliable measures of disease prevalence. The goal of the study in chapter 7 is to systematically compare these three measures of disease prevalence.

The comparison is made between three measures of diabetes that are now integrated into the consolidated Health and Retirement Study database: (a) the commonly used survey measure of diabetes, (b) diabetes as measured by HbA1c levels collected in the HRS biomarker data, and (c) diabetes in the Medicare insurance claims linked to the HRS data. Self-reported diabetes and biomarker data align for a large part of the sample (85 percent). Most of the differences between the two measures is likely explained by the fact that treatment lowers HbA1c levels in some cases even below the 6.5 percent threshold.

When considering the three data sources, roughly 2–3 percent of individuals have diabetes according to HbA1c, but do not report diabetes and do not receive diabetes treatment according to their claims records. Even in the Medicare population there is thus a fraction of individuals who likely have undiagnosed diabetes. Somewhat surprisingly, however, the study does not find that the probability of being undiagnosed is related to socioeconomic status.

Importantly, comparing the three measures of diabetes, as well as taking into account information on treatment, suggests that none of the three measures should be taken as a gold standard. In particular, the results indicate that both the presumably more objective biomarker as well as the claims data suffer from error just as the self-reports contain errors. While the biomarker data can be influenced by treatment and thus may not identify cases as diabetic because their diabetes is well managed, the claims data may falsely classify individuals as diabetics. In addition, individuals who have diabetes but are not treated for it will also be misclassified based on the claims data.

In a final section, the chapter discusses the potential for integrative statistical models that take advantage of the combined information in all three measures. Even in more simplistic integration of the measures, the authors

find that adding claims information to combined self-reports and biomarkers reduces undiagnosed diabetes cases from 3.26 percent to 2.4 percent in 2006 and from 4.05 percent to 3.1 percent in 2008, that is, by between one-quarter and one-third. Thus, including all three measures in a major study such as the HRS improves measurement of disease prevalence substantially.

In chapter 8, Thomas MaCurdy and Jay Bhattacharya look at “Challenges in Controlling Medicare Spending: Treating Highly Complex Patients.” They point out that any policy offering hope of success in mitigating the unsustainable rise in Medicare expenses must focus its impacts on the highest-cost users of Medicare. The goal of the study, therefore, is to better understand these high-cost users. What the study reveals is that beneficiaries with multiple illnesses cost considerably more than would be predicted by adding up the costs of treatment for each disease/illness condition in isolation. Put differently, increasing the number of comorbidities induces a multiplicative rather than an additive cost structure. Moreover, the patterns of disease/illness combinations are quite diverse with individual combinations populated by small numbers of patients. These empirical findings demonstrate that most Medicare expenditures are associated with small sets of medically complex patients.

Among the more specific quantitative findings of the study, about 52 percent of Medicare spending goes to treat 8 percent of the total service months when beneficiaries are afflicted by four or more major health conditions (e.g., cancer, diabetes, renal failure, chronic heart failure, etc.). During these periods of treatment, beneficiaries suffer from nearly 5.5 million combinations of major health conditions. Around 31 percent of spending goes to treat less than 3 percent of the time when Medicare beneficiaries suffer from six or more major health conditions; during these periods, beneficiaries suffer from nearly 4.2 million combinations of major conditions.

Translated into an annual context for beneficiaries, 18 percent of Medicare beneficiaries are afflicted by four or more major health conditions sometime during the year, and they account for 63 percent of total Medicare spending. These beneficiaries suffer from nearly 7.5 million combinations of major health conditions during the year. About 7 percent of Medicare beneficiaries are afflicted by six or more major health conditions and account for 41 percent of Medicare spending. These beneficiaries alone suffer from more than 6.4 million combinations of major illnesses, with an average of three distinct combinations per Medicare beneficiary with six or more health conditions. Regardless of the perspective used to assess medical complexity, patients are strikingly more expensive to treat and more distinct as the number of comorbidities grows.

These findings have some significant policy implications. First, in the area of reimbursement policy, the findings suggest that risk-adjustment models currently used by Medicare inadequately compensate for complex patients due to a cost structure that assumes linearity in health-condition indicators.

Second, quality-improvement programs such as disease management and care coordination must be formulated to individualize treatments necessary for patients suffering from a wide array of illnesses. Although these forms of medical practice can offer flexibility in dealing with comorbidities, the level of variability in comorbidities documented in this report indicates that care coordination models will be continually challenged with novel clinical situations.

In chapter 9, “Movies, Margins, and Marketing: Encouraging the Adoption of Iron-Fortified Salt,” Abhijit Banerjee, Sharon Barnhardt, and Esther Duflo analyze a major experimental intervention designed to reduce anemia in the Bihar region of India. According to the National Family Health Survey, 67 percent of adult women, 34 percent of adult men, and 78 percent of children under the age of three years suffered from some form of anemia in Bihar in 2005–2006. The promise of double-fortified salt to reduce anemia and increase productivity rests on two premises: that households will be willing to buy it and use it, even at a reduced price—or potentially for free—and that it is effective enough, at the levels of fortification that are stable and safe, to make a real difference. The chapter addresses the first question.

A number of experiments were conducted, parts of which provided for the free distribution of fortified salt, parts of which offered shopkeepers the opportunity to stock fortified salt at a subsidized price, and parts of which tested the effectiveness of different forms of social marketing. For example, one marketing approach used a twenty-six-minute “edutainment movie,” screened during the intermission of a very popular film. Another hand delivered flyers with information about the product.

The study finds that the basic marketing campaign conducted by the manufacturer at launch was completely ineffective at conveying why this salt should be purchased: two years after the introduction of the product, absent any additional information campaign, no one who bought the salt knew that it helps reduce anemia or reports buying it because it is good for the health of household members. Even when the salt was provided for free, only about half of households actually used it for cooking. And when they could buy it for just below half price, with no other intervention, about 20 percent of households give it a try, but only 10 percent still used it after three years.

Against this backdrop, the chapter also shows the power of a strong communication campaign. In villages where about 20 percent of residents saw the movie, consumption of doubled-fortified salt increased by 5.5 percentage points, an increase of 50 percent over the mean for households who get price subsidies, and more than 10 percent over the mean usage among those who get the salt for free. Eight percent of households who reported buying fortified salt at the end of the experiment period indicate that they bought this salt because it helps fight anemia (although that leaves 92 percent who do so for other reasons), and because it is subsidized (as advertised in the movie).

The chapter also highlights how powerful shopkeepers are in influencing what households do. A small increase in retailer margins resulted in an increase in take-up at least as large as that caused by the movie screening. There is some ambiguity on how this was achieved. The retailers claim that they dropped the final price of the salt (very little). Village households do not report such a decline and instead claim that they bought the salt because it was the only one available. More generally, over half of the buyers report that they just bought whatever the shopkeeper gave them. While the study is informative, there remains substantial work in refining these interventions to be as effective as possible.

### **Life Satisfaction or Happiness**

Extending beyond traditional measures of health, some of the most recent research in the NBER aging program has considered well-being in a more general sense. It has explored issues in mental health, emotional well-being, life satisfaction, and happiness.

In chapter 10, Anne Case and Angus Deaton focus specifically on “Suicide, Age, and Well-Being: An Empirical Investigation.” The study juxtaposes suicide rates with other measures of physical and mental well-being, using data from the United States and from other countries to examine patterns of suicide and well-being by age and across space.

Suicide rates, life evaluation, and measures of affect are all plausible measures of the mental health and well-being of populations. Yet in the settings examined in chapter 10, correlations between suicide and measured well-being are at best inconsistent. With a few exceptions, the findings suggest that suicide has little to do with life satisfaction. Differences in suicides between men and women, between Hispanics, blacks, and whites, between age groups of men or of African Americans, between countries or US states, between calendar years, and between days of the week, do not match differences in life evaluation.

Suicide rates in the United States have risen in recent years, though there is no evidence of decreases in subjective well-being (SWB). Marriage and education do indeed bring more life satisfaction and less suicide, though the relative sizes of the effects do not match the effects on SWB, even for men and women separately. For example, when controlling for age, sex, and race, being married comes with higher life evaluation and lower suicide. For men, as one should expect, those who are divorced have lower well-being and higher suicide rates, but the magnitude of the effect on suicide is much larger relative to the effect on life evaluation than is the case for marriage. When looking at widowers, there is more suicide, comparable to the suicide associated with divorce, yet widowed men actually show slightly higher life evaluation.

Women's suicide rates peak in middle age and men's in old age; yet, both men and women show a U-shape in life evaluation. Suicide rates among non-Hispanic blacks fall with age alongside declines in life evaluation. Sixteen percent of suicides happen on Mondays and only 13 percent happen on Saturdays. Yet life evaluation is the same on all days of the week.

Age patterns of suicide are different for men and women and have changed differentially over time. The authors suggest that the most important facts about suicide over the last decade are that for white non-Hispanics, both men and women, (a) suicide is rising overall, which is driven by (b) increasing suicide rates in middle age, offset by (c) falling suicide rates among the elderly. The suicide epidemic in middle age is the tip of an iceberg of mortality and morbidity, especially pain, among middle-age Americans. In Gallup data, "pain yesterday" is now higher in middle age than in old age. The authors do not know what is driving this epidemic, but it is showing up in at least some of the SWB indicators, including low positive affect in middle age, and perhaps even as some of the dip in middle-age life evaluation, the presence of which they find little evidence of prior to the last decade. Their tentative hypothesis is that pain is an underlying fundamental cause, and that it is driving changes in both suicides and SWB.

There are very large variations in suicides across states in the United States (by a factor of more than two) and across counties (by a factor of more than seven). At the county level, but not the state level, suicide rates are lower where life evaluation is higher, but higher where negative affect is lower, and uncorrelated with positive affect. Pain is strongly correlated with suicide, across both states and counties, and is a significant predictor even conditional on standard predictors, such as income, income inequality, and religious denomination.

Finally, across fifty-two countries in the Organisation for Economic Co-operation and Development (OECD), Latin America, and Eastern Europe, suicide rates are neither well nor consistently correlated with well-being measures. In a majority of countries, suicides are higher among the elderly, particularly for men. In countries where life evaluation is high in old age relative to middle age, suicides are relatively low in old age, and vice versa. At least some of this is driven by the extreme negative effects of the transition on the elderly in Eastern Europe.

In chapter 11, Raquel Fonseca, Arie Kapteyn, Jinkook Lee, and Gema Zamarro ask "Does Retirement Make You Happy? A Simultaneous Equations Approach." Labor force participation may affect subjective well-being in different ways and in different contexts. It may relate to the type of job in which retirees were employed before retirement, whether the retirement is perceived as voluntary or forced, whether retirement affects the financial circumstances of the household, or the cultural context of one country or sociodemographic group versus another. With policy reforms that increase

pension entitlement ages in many countries, and that induce more workers to continue in the labor force until older ages, the relationship between retirement and subjective well-being is an important one.

The study in chapter 11 aims to improve our understanding of these issues using a simultaneous model that accounts for the interplay of pension incentives, retirement, income, and subjective well-being. By estimating the complete system of equations, the aim is to more accurately evaluate the role of retirement induced through Social Security or pension eligibility in determining the subjective as well as financial well-being of the elderly.

In the raw data, the study finds that being retired is positively correlated with the risk of depression and negatively correlated with life satisfaction. However, after accounting for the reverse causal effects of well-being measures on retirement, the estimated relationships are reversed. In the most flexible specification with forty age dummies, the effect of retirement on either depression or life satisfaction is insignificant. Income does not appear to play much of a role in the determination of depression or life satisfaction, once other factors are accounted for. This also contrasts with the correlations in the raw data, which suggested that higher income leads to higher life satisfaction and to fewer depressive symptoms.

As one would expect, household wealth, being married, and educational attainment are all positively related to life satisfaction and reduce the probability of depression. Health conditions and difficulties with activities of daily living increase the probability of depression and reduce life satisfaction.

The fairly weak effects of retirement on life satisfaction and depression suggest that, at least as far as these variables are concerned, gradual increases in retirement ages will have only moderate effects on population measures of well-being. The authors emphasize, however, that these are average effects and do not account for either individual variations in how retirement affects well-being or, possibly, more systematic variations across sociodemographic groups.