



August 2019

RETIREMENT SECURITY

Income and Wealth Disparities Continue through Old Age

Why GAO Did This Study

Income and wealth inequality in the United States have increased over the last several decades. At the same time, life expectancy has been rising, although not uniformly across the U.S. population. Taken together, these trends may have significant effects on Americans' financial security in retirement.

GAO was asked to examine the distribution of income and wealth among older Americans, as well as its association with longevity, and identify the implication that these trends may have on retirement security. This report examines (1) the distributions of income and wealth among all older Americans over time; (2) the association between income, wealth, and longevity among older Americans; and (3) how the distributions of income and wealth changed over time for a cohort of individuals as they aged. To conduct this work, GAO analyzed data from two nationally representative surveys: the SCF, using data from 1989 through 2016, and the HRS. GAO used 1992 through 2014 HRS data linked to earnings records from the Social Security Administration. While preliminary 2016 HRS data are available, GAO used 2014 data, which contain more complete information for GAO's analysis. GAO also reviewed studies and interviewed researchers to further analyze the relationships between income, wealth, longevity, and retirement security.

View [GAO-19-587](#). For more information, contact Charles A. Jeszeck at (202) 512-7215 or jeszeck@gao.gov.

RETIREMENT SECURITY

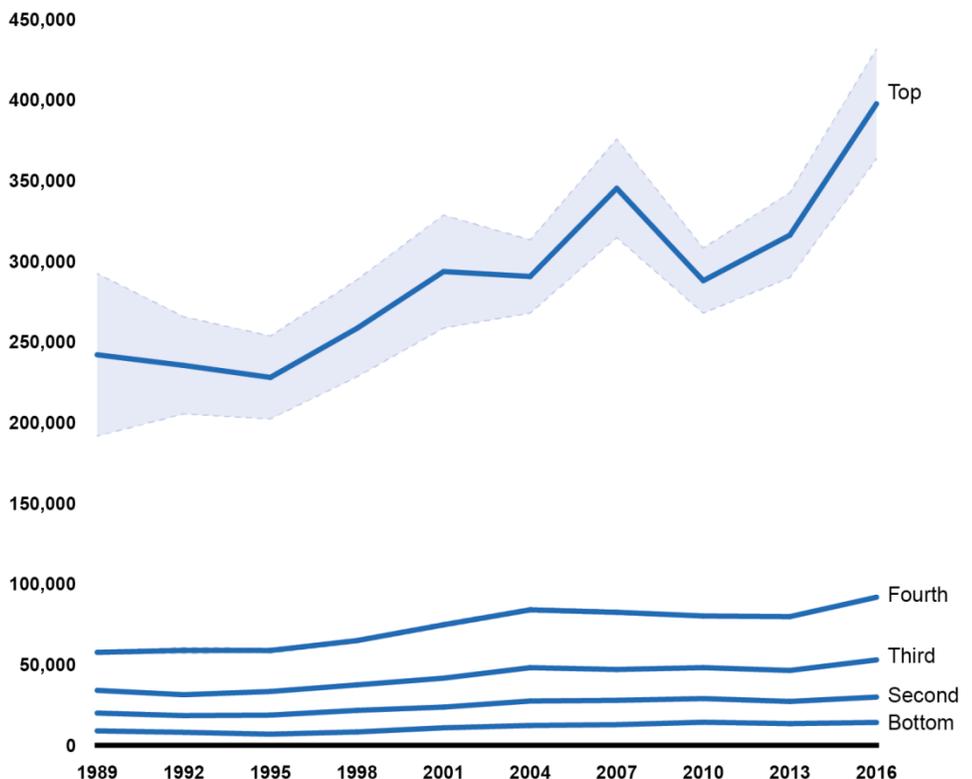
Income and Wealth Disparities Continue through Old Age

What GAO Found

Disparities in income and wealth among older households have become greater over the past 3 decades, according to GAO's analysis of Survey of Consumer Finances (SCF) data. GAO divided older households into five groups (quintiles) based on their income and wealth. Each year of data in the analysis, and, thus, each quintile, included different sets of households over time. Average income and wealth was generally higher over time (see fig. 1 for average income), disproportionately so for the top quintile (top 20 percent). For example, in 2016, households in the top quintile had estimated average income of \$398,000, compared to about \$53,000 for the middle quintile and about \$14,000 for the bottom quintile. GAO also found that for quintiles with lower wealth, future income from Social Security and defined benefit pensions provide a relatively significant portion of resources in retirement for those who expect such income.

Figure 1: Estimated Average Household Income of Older Households by Income Quintiles, 1989 to 2016

Average household income (in 2016 dollars)



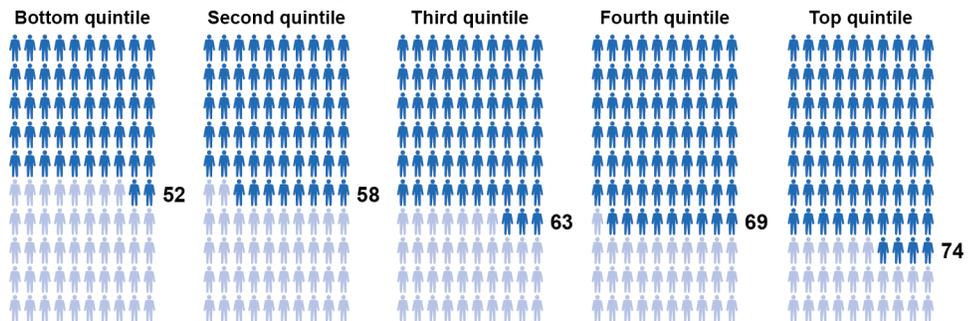
Source: GAO analysis of 1989 through 2016 Survey of Consumer Finances data. | GAO-19-587

Notes: Income is aggregated across all sources, such as wages, Social Security benefits, or withdrawals from retirement savings accounts. Averages represent mean estimates. The shaded portions of the figure represent 95 percent confidence intervals; the intervals for some quintiles are less visible because they are very narrow. The Survey of Consumer Finances is conducted every 3

years. Older households are those where the survey respondents or any spouses or partners were aged 55 or older in the year of the survey. GAO ranked these households by their income and broke them into five equally sized groups, or quintiles. Each year of data in our analysis, and, therefore, each quintile included different sets of households over time.

A substantial number of older Americans born from 1931 through 1941 lived at least into their 70s or early 80s, according to GAO's analysis of data from the Health and Retirement Study (HRS), a nationally representative survey which follows the same individuals over time. GAO divided individuals born from 1931 through 1941 into quintiles based on their mid-career household earnings using records from the Social Security Administration. GAO's analysis, as well as that of other researchers, shows that differences in income, wealth, and demographic characteristics were associated with disparities in longevity. However, even with these disparities, we found a substantial number of people in the sample were alive in 2014, including those with characteristics associated with reduced average longevity, such as low earnings (see fig. 2) and low educational attainment. Taken all together, individuals may live a long time, even individuals with factors associated with lower longevity, such as low income or education. Those with fewer resources in retirement who live a long time may have to rely primarily on Social Security or safety net programs.

Figure 2: Estimated Proportion of Older Americans Ages 51 to 61 in 1992 Still Living in 2014, by Mid-Career Household Earnings



Source: GAO analysis of 1992 through 2014 Health and Retirement Study data. | GAO-19-587

Notes: Older Americans ages 51 to 61 in 1992 were ages 73 to 83 in 2014. GAO defined mid-career household earnings based on earnings reported to the Social Security Administration for years when the survey respondents were ages 41 through 50, as well the earnings of their spouses or partners during those years if the respondents were part of a couple in 1992. GAO ranked these households by their mid-career household earnings and broke them into five equally sized groups, or quintiles. The proportion of individuals alive in 2014 was estimated using a Kaplan-Meier survival analysis.

GAO's analysis of HRS data also found that disparities in household income decreased while disparities in wealth persisted as a cohort of older Americans aged from approximately their 50s into their 70s or early 80s. Income disparities decreased between higher- and lower-earning households because higher-earning households saw larger drops in income over time, indicating the possible transition from working to retirement. For example, we estimated median income for the top mid-career earnings group decreased by 53 percent while estimated median income for the bottom earnings group decreased by 36 percent over the same period. Wealth remained relatively steady for households in the bottom three earnings groups over the time period GAO examined, while households in the top two earnings groups experienced larger fluctuations in wealth. GAO estimated that median retirement account balances and median home equity increased across earnings groups for households that had these assets. However, the continued wealth disparities may be due to significant differences in the median value of retirement accounts and home equity between higher- and lower-earning households. GAO also found that white households in the bottom two earnings groups had higher estimated median incomes, and white households in all earnings groups generally had greater estimated median wealth, than racial minority households in those earnings groups. In addition, within each earnings group, households headed by someone with at least some college education generally had higher median incomes and wealth than households headed by someone who did not attend college.

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Abbreviations

DB	defined benefit
DC	defined contribution
ERISA	Employee Retirement Income Security Act of 1974
FA	Financial Accounts of the United States
Federal Reserve	Board of Governors of the Federal Reserve System
HRS	Health and Retirement Study
IRA	individual retirement account
IRC	Internal Revenue Code
SCF	Survey of Consumer Finances
SSA	Social Security Administration

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August 9, 2019

The Honorable Bernard Sanders
Ranking Member
Committee on the Budget
United States Senate

Dear Senator Sanders:

Income and wealth inequality in the United States have increased over several decades. While income inequality in the United States was relatively stable from the 1940s to the 1970s, since then wage growth at the top of the income distribution has outpaced the rest of the distribution, and inequality has risen. Wealth has become increasingly concentrated as well. By 2013, those families in the top 10 percent of the wealth distribution held 76 percent of the wealth held by all families in the United States.¹ Inequality among older Americans, specifically, is an area of concern for some policy makers and researchers, particularly given trends related to the U.S. retirement system over this same time period. For example, average life expectancy has increased. This is a positive development, but it also requires more planning and saving to support more years in retirement. Further, income, wealth, and longevity are each interconnected with one another. For example, life expectancy has not increased uniformly across all income groups, and people who have lower incomes tend to have shorter lives than those with higher incomes. There is concern among some researchers and policy makers that disparities in income, wealth, and life expectancy may be indicative of potential problems for many Americans' financial security in retirement.

You asked us to examine the distribution of income and wealth among older Americans and identify the implication of these trends, along with associations with longevity, on retirement security. This report examines (1) the distributions of income and wealth among all older Americans over time; (2) the association between income, wealth, and longevity among older Americans; and (3) how the distributions of income and wealth have changed over time for a cohort of individuals as they aged.

¹Congressional Budget Office, *Trends in Family Wealth, 1989 to 2013*, Report 51846 (Washington, D.C.: August 2016).

To examine the distribution of income and wealth among all older Americans over time, we used 1989 through 2016 data from the Survey of Consumer Finances, a triennial, cross-sectional survey produced by the Board of Governors of the Federal Reserve System (Federal Reserve). A different sample of households was used for each year in our analysis. These data allow for comparison of the experiences of same-age households at different points in time. We chose to look at household-level resources because couples may pool their economic resources and the SCF asks some of its questions about resources for households. For each survey year, we examined the distribution of income and wealth for older households as a whole and by household heads' race and ethnicity, marital status and gender, and education level. We defined older households as those in which the household head or any spouses or partners were aged 55 or older. We also analyzed the percentage of households that held various sources of income and wealth and the amounts of such sources across the income and wealth distributions.

Lastly, we used these data, supplemented by data from the Financial Accounts of the United States—another data source published by the Federal Reserve—to estimate the present value of future income expected from defined benefit (DB) pension plans and Social Security. To do so, we followed methods developed by economists at the Federal Reserve, with some modifications to the Social Security methods, in particular, to meet the purposes of our analysis.² Alternative methods of analyzing distributional disparities in retirement security exist. For example, one option would be to evaluate how future monthly income from Social Security and DB pensions would be expected to affect retirement security, perhaps by assessing how the standard of living for workers would be expected to change. Additionally, disparities in health in adulthood could contribute to subsequent disparities in income and wealth at older ages. However, for our analysis of how income and wealth are distributed across older Americans over time, it was useful to estimate the present value of Social Security and DB pensions so we could compare the value of these sources to retirement account balances. In

²The Federal Reserve economists continue to refine their methodology, and we relied on recently available papers as a starting point for our analysis. For more on the Federal Reserve economists methods, see Sebastian Devlin-Foltz, Alice Henriques, and John Sabelhaus, "Is the U.S. Retirement System Contributing to Rising Wealth Inequality?" *The Russell Sage Foundation Journal of the Social Sciences*, vol. 2 no. 6 (2016). For more on the modifications we made, see appendix I.

addition, the SCF does not include sufficient data on health to consider its role in income and wealth disparities for this part of our analysis.

To examine the association between income, wealth, and longevity among a cohort of older Americans, we used 1992 through 2014 data from the Health and Retirement Study (HRS), a nationally representative, longitudinal survey that follows the same set of Americans from their 50s through the remainder of their lives. Use of a longitudinal survey allows us to follow changes for specific individuals as they age. We analyzed data for the cohort of individuals born from 1931 through 1941.³ We identified the distribution of income across these individuals by constructing a measure of mid-career earnings. This measure was constructed at the household level and was based on the household's average annual reported earnings when the household head was aged 41 to 50. Household earnings data came from administrative records from the Social Security Administration linked to survey responses.⁴

We then analyzed how the longevity of these individuals varied across mid-career household earnings and demographic characteristics, such as race and education level, using a technique called survival analysis. We were able to measure deaths over a period of 22 years (1992 through 2014). Every 2 years, the HRS attempted to measure whether the original respondents were still alive, but these longevity data were incomplete because some of the original respondents declined to participate in later waves of the survey. Once these respondents left the survey, their actual longevity could not be followed. Survival analysis accounts for survey respondents with complete or incomplete longevity data and allowed us to estimate the chance of death by any given time in the observation period. Most importantly, our analysis assumed actual longevity from 1992 to 2014 of the individuals in our analysis did not have a systematic relationship with whether the original HRS respondents continued to participate in the study except that leaving the study implied a later death. We believe this assumption to be reasonable for the purpose of our analysis for two reasons. First, a small percentage (8 percent) of the original respondents dropped out of the survey, so that the impact of any longevity differences among the population who dropped out would likely

³The HRS program refers to those born from 1931 through 1941 as its core HRS cohort or its original cohort.

⁴This measure of earnings provides a relatively stable indicator of the household's labor market experience, compared to using a single year of earnings, which could be unusually high or low. See appendix I for additional details.

have been small. Second, while some baseline characteristics of respondents do appear correlated with non-response over time, the population that dropped out of the study does not appear to vary significantly from those completing each wave, except for race and ethnicity. We conducted this analysis, at the individual level, for HRS respondents in 1992, and any spouses or partners also born in 1931 through 1941.

We also used the HRS data and the mid-career household earnings measure to compare trends in the distributions of income and wealth, at the household level, as the cohort aged. We restricted this analysis to survey respondents (“household heads”), or any spouses or partners as of 1992, who were still alive in 2014 to ensure we followed the same group of people throughout our analysis. This analysis included an examination of trends by demographic characteristics and by specific sources of income and wealth.

For the purposes of our analysis, we defined wealth to be a household’s net worth—that is, total assets minus total debt. Net worth is a measure often used by researchers studying retirement security. As mentioned above in our summary of how we examined the distribution of income and wealth over time, older Americans may also have other future retirement resources, not included in net worth, such as the present value of future income expected from defined benefit (DB) pension plans and Social Security. For all three questions, we supplemented analyses with expert interviews and a literature review to provide greater insight. We specifically identified researchers’ explanations and theories about the relationships between inequality and longevity, health status, gender, race and ethnicity, or education.

For all of the datasets used in our study, we reviewed documentation, interviewed or obtained information from officials responsible for the data, and tested the data for anomalies. We determined that these data are sufficiently reliable for the purposes of this report. To provide additional context on the relationships among income, wealth, longevity, and retirement security, we reviewed 29 studies. The bibliography at the end of this report lists these studies, as well as other recent studies, that informed this report. We also reviewed relevant federal laws and regulations. See appendix I for more detailed information about our scope and methodology.

We conducted this performance audit from August 2017 to August 2019 in accordance with generally accepted government auditing standards.

Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

Retirement Resources

Many older Americans are retired and rely on different parts of the U.S. retirement system for their financial security. The U.S. retirement system is often described as being composed of Social Security, employer-sponsored pensions and retirement savings plans, and individual savings. In addition, older Americans may work past traditional retirement ages or phase into retirement.

Social Security's Old-Age and Survivors Insurance program is the foundation of the U.S. retirement system and provides benefits to retired workers, their families, and survivors of deceased workers. In 2018, about 53 million retirees and their families received \$844.9 billion in Social Security retirement benefits, according to the Social Security Administration.⁵ However, Social Security is facing financial difficulties that, if not addressed, will affect its long-term stability. If no changes are made, current projections indicate that by 2034, the retirement program Trust Fund will only be sufficient to pay 77 percent of scheduled benefits.⁶

Employer-sponsored pensions include DB plans, which generally promise to offer a monthly payment to retirees for life. Employers also sponsor defined contribution (DC) plans, such as 401(k)s, in which individuals accumulate tax-advantaged retirement savings in an individual account based on employee and/or employer contributions, and the investment returns (gains and losses) earned on the account. Participants in both DB and DC plans receive certain tax preferences provided the plans comply with requirements outlined in the Internal Revenue Code (IRC). For fiscal year 2018, estimated tax expenditures related to retirement plans and

⁵The Board of Trustees, *The 2019 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds* (Washington, D.C.: April 22, 2019).

⁶Ibid.

savings amounted to about \$188 billion.⁷ The Employee Retirement Income Security Act of 1974 (ERISA) outlines minimum standards and requirements that must be met by most private sector employer-sponsored retirement plans; it does not, however, require any employer to establish, or continue to maintain, a retirement plan. Assets rolled over from employer-sponsored DC plans when individuals change jobs or retire are the primary source of funding for individual retirement accounts (IRAs). Over the past 40 years, private sector employers have increasingly moved from offering DB plans to offering DC plans. While DC plans offer more portability, some financial risks—such as poor investment returns, decreases in interest rates, and increases in longevity—have shifted from the employer to the employee, with important implications for individuals’ retirement planning and security.⁸

Individual savings are any other non-retirement plan savings and investments. Home equity is an important asset for many households. Other sources of savings or wealth may include amounts saved from income or wages, contributions to accounts outside of a retirement plan, non-retirement financial wealth that is inherited or accumulated over time, and equity from other tangible assets such as vehicles.

Defining Resources in Retirement

- **Wealth:** For analyses in this report, we defined wealth as net worth, i.e., assets minus debt. Assets could be financial (e.g., savings accounts, stocks, bonds, retirement accounts) or nonfinancial (e.g., the value of any houses or vehicles). Retirement accounts include defined contribution plans, such as a 401(k), or individual retirement account (IRA)s. Net worth is a measure often used by researchers studying retirement security.

⁷Office of Management and Budget, *Analytical Perspectives, Budget of the U.S. Government, Fiscal Year 2020* (Washington, D.C.: 2019). This total includes estimates for deferrals for contributions to DB plans, DC plans, and other plans covering partners and sole proprietors, individual retirement accounts, and certain retirement saving tax credits. This estimated total, which is based on provisions of federal tax law enacted through July 1, 2018, is measured as the tax revenue that the government does not currently collect on contributions and investment earnings, offset by the taxes paid by those who are currently receiving retirement benefits. Summing tax expenditure estimates is useful for gauging the general magnitude of revenue forgone through provisions of the tax code, but does not take into account interactions among individual provisions. Revenue loss estimates do not necessarily represent the amount of revenue that would be gained from repealing a tax expenditure, because repeal would probably change taxpayer behavior in some way that would affect revenue.

⁸For more discussion about the key characteristics of DC and DB plans, see GAO, *The Nation’s Retirement System: A Comprehensive Re-evaluation Is Needed to Better Promote Future Retirement Security*, [GAO-18-111SP](#) (Washington, D.C.: Oct. 18, 2017).

- Present value of future income from Social Security and defined benefit pensions: Older Americans may also have other future retirement resources, not included in net worth, such as the present value of benefits expected from defined benefit (DB) pension plans and Social Security. These present value estimates could be included in a broader definition of economic resources or wealth, and we were able to produce estimates of these additional retirement resources to supplement our analysis of the distribution of income and wealth among older Americans over time. While all estimates produced using survey data are subject to some uncertainty, our present value estimates for these additional retirement resources are also subject to additional uncertainty that arises from using another data source—the Financial Accounts of the United States—to create a measure of aggregate defined benefit entitlements; having limited information about lifetime earnings in the Survey of Consumer Finances; and making assumptions about life expectancy, real discount rates, and retirement ages, which are unlikely to hold for all households. Data limitations prevented us from producing this broader measure of retirement resources for our analysis examining the distributions of income and wealth as a cohort of older Americans aged.
- Income: For analyses in this report, we defined household income as the sum of income across all sources, including wages and salaries, Social Security benefits, traditional pension benefits from defined benefit plans, withdrawals from retirement accounts, and income from any other sources, such as interest on financial assets or benefits from social safety net programs such as the Supplemental Nutrition Assistance Program (SNAP).

See appendix I for more information on our definitions and the methods used to produce estimates of wealth, the present value of future income expected from Social Security and defined benefit plans, and income.

Source: GAO analysis. | GAO-19-587

Older Americans may also have wages or salaries from working longer as they transition to retirement. According to data from the Bureau of Labor Statistics, more older Americans are working. From 1989—the earliest starting year for our analyses—to 2018, the labor force participation rate for Americans aged 55 or older increased from 30 percent to 40 percent. In addition, some older Americans may receive income from financial assets, such as interest or dividends, and from other benefit programs, such as Social Security Disability Insurance.

Increases in the Number of Older Americans

The number of older Americans is increasing faster than the population as a whole. In 1990, about 52 million, or around 1 in 5, people in the United States were aged 55 or older. By 2030, that number is expected to be about 112 million, or around 1 in 3. The aging of the baby boomers—that is, people born between 1946 and 1964—as well as increasing longevity and lower fertility have contributed to this trend. The oldest baby boomers turned 55 in 2001 and the youngest are turning 55 this year. In addition, average life expectancy for those ages 65 or older has

increased significantly over the past century and is projected to continue to increase.⁹ For example, a man turning 65 in 2030 is expected to live, on average, to age 85.0, an additional 5.3 years compared to a man who turned 65 in 1980, who was expected to live, on average, to age 79.7. A woman turning 65 in 2030 is expected to live, on average, to age 87.3, an additional 3.5 years compared to a woman who turned 65 in 1980, who was expected to live, on average to age 83.8. Since life expectancies are averages—some individuals will live well beyond their life expectancy—longer life expectancies, combined with the possibility of living well beyond life expectancy, mean that people must now prepare for the potential for more years in retirement with greater risk of outliving their savings.

⁹Life expectancy is the average estimated number of years of life for a particular demographic or group of people at a given age. It is closely related to longevity, which is commonly defined as “length of life.”

Disparities in Income and Wealth Increased Among Older Households Even As More Households Had Retirement Accounts

Disparities Increased from 1989 to 2016, with Households in the Top 20 Percent Generally Having Disproportionately Higher Income and Wealth in 2016

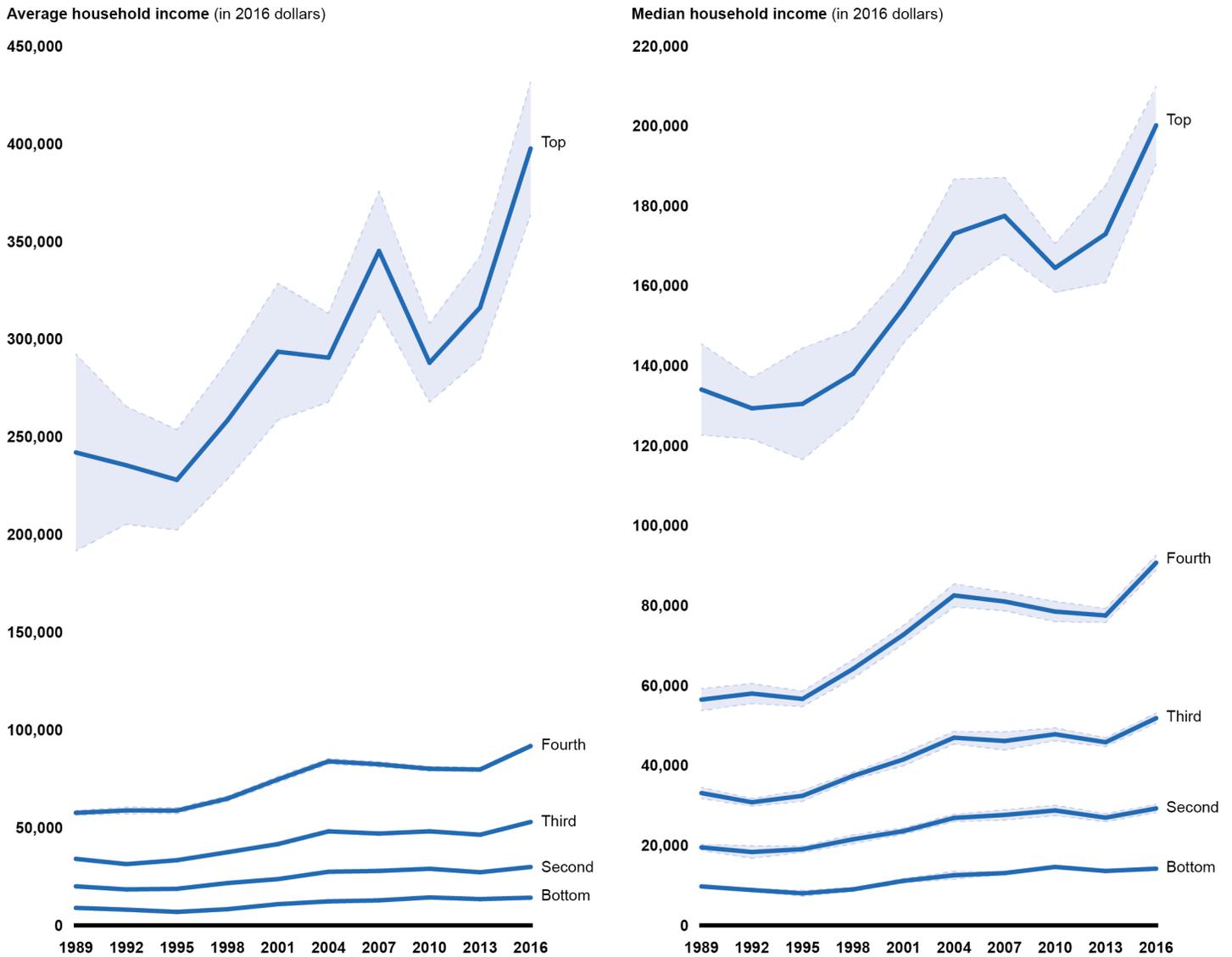
Disparities in income and wealth among older households have become greater over the past 3 decades, according to our analysis of 1989 to 2016 data from the SCF. For our analysis, we divided older households in the data into five groups, or quintiles, based on income or wealth.¹⁰ Each year of data in our analysis used a different set of households. Therefore, each quintile includes different sets of households over time. In other words, the households in the top 20 percent in 1989 are not the same households as those in the top 20 percent in 2016. While the households included in the SCF are different for each year of data we used in our analysis, we were able to examine how the distribution of income and wealth across older households changed over time. We found mostly higher income and wealth across all quintiles over time, disproportionately so for the top quintile. For example, we estimated that average income of households in the top 20 percent in 1989 was about \$242,000. In 2016, estimated average income of households in the top 20 percent was about \$398,000, which is about 64 percent higher (see fig 1). In comparison, estimated average income of households in the bottom quintile—bottom 20 percent—was about \$9,000 in 1989. In 2016, estimated average

¹⁰For this analysis, we identified “older households” as those where the survey respondents or any spouses or partners were aged 55 or older in the year of the survey. To create income distributions, we rank ordered these households by total household income and then broke them into five even groups, or quintiles. The “top” refers to the top 20 percent of households in this ranking while the “bottom” refers to the bottom 20 percent of households. Since the SCF is cross-sectional, and each year of data in our analysis used a different set of households, we created a new income distribution for each year of data. Therefore, each quintile includes different sets of households over time. We also created wealth distributions, using the same method, except we rank ordered households by net worth instead of income. To better understand increases in the top quintile, we also estimated the amount of income and wealth held among the top 10 percent, 5 percent, and 1 percent of households, when possible, for each survey year.

income of households in the bottom 20 percent was about \$14,000, which is about 55 percent higher.¹¹ We found similar results when we analyzed changes in median income.

¹¹All amounts in this report are presented in 2016 dollars. As another example, households in the middle quintile in 2016 had estimated average income of about \$53,000. In addition, we estimated that, in 2016, all households in the bottom quintile had less than \$22,000 in income; households in the second quintile had incomes between \$22,000 and \$40,000; households in the middle quintile had incomes between \$40,000 and \$69,000; households in the fourth (second-from-the-top) quintile had incomes between \$69,000 and \$123,000; and households in the top quintile had incomes over \$123,000.

Figure 1: Estimated Average and Median Income of Older Households by Income Quintiles, 1989 to 2016



Source: GAO analysis of 1989 through 2016 Survey of Consumer Finances data. | GAO-19-587

Notes: Income is aggregated across all sources, such as wages, Social Security benefits, or withdrawals from retirement accounts. Averages represent mean estimates. The shaded portions of the figure represent 95 percent confidence intervals; the intervals for some quintiles are less visible because they are very narrow. The Survey of Consumer Finances is conducted every 3 years. Older households are those where the survey respondents or any spouses or partners were aged 55 or older in the year of the survey. We ranked these households by their income and broke them into five equally sized groups, or quintiles. Each year of data in our analysis, and, therefore, each quintile included different sets of households over time.

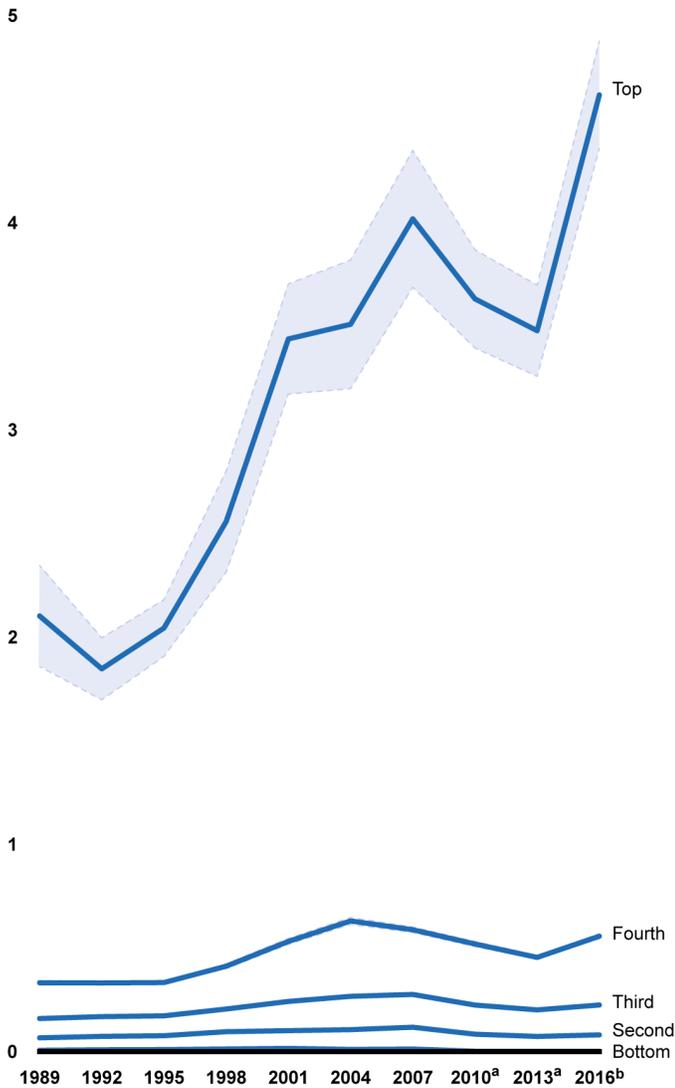
Our findings were similar when we analyzed changes in wealth (defined as net worth). Estimated average wealth of households in the top 20 percent was about \$2.1 million in 1989. In 2016, estimated average wealth of households in the top 20 percent was about \$4.6 million, which is more than twice as high. (See fig. 2.) In comparison, average wealth of households in the bottom 20 percent was similar over time from 1989 to 2013.¹² In fact, in both 2010 and 2013, estimated average wealth of households that were in the bottom 20 percent in either of those years was negative, meaning that those households, on average, had more debt than assets.¹³ (See text box for discussion of how recessions during the time period of our analysis could affect retirement security.)

¹²There were insufficient data to produce a reliable estimate of average wealth for the bottom quintile in 2016.

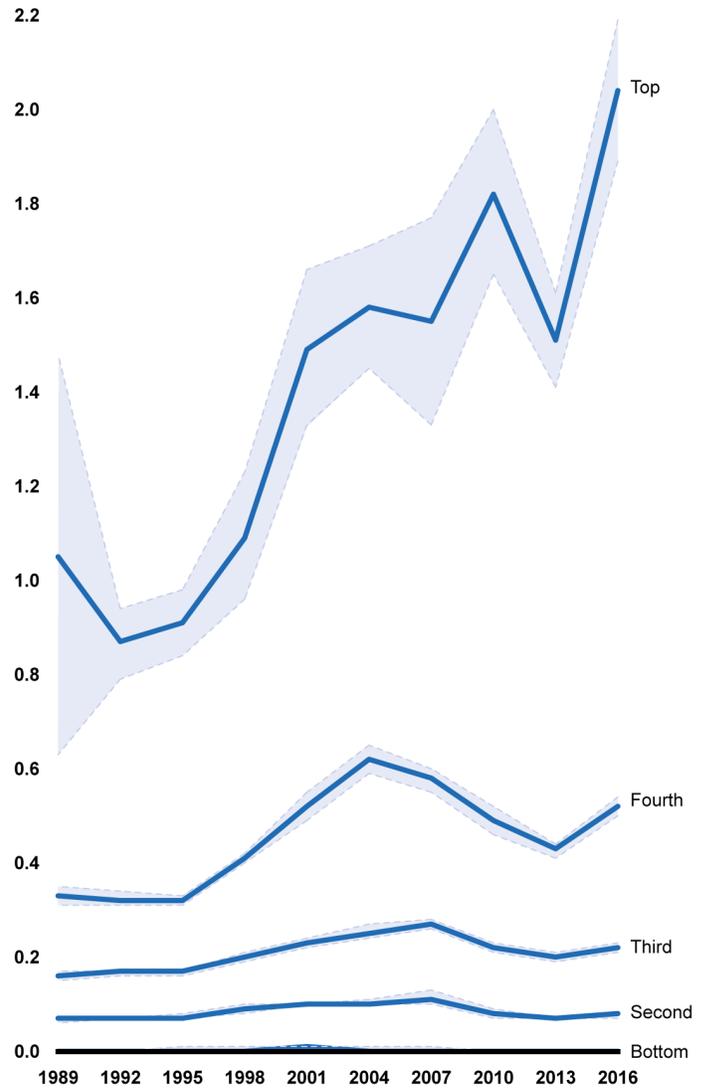
¹³While the difference between estimates for 2016 and 1989 in the amount of average and median wealth held by the bottom 20 percent was relatively small compared to the differences for other quintiles, there were statistically significant differences among other particular years over the time period of our analysis. Also, there were insufficient data to produce a reliable estimate of average wealth for households in the bottom 20 percent in 2016. We estimate that average wealth for this group was about \$4,500 in 1989. In 2010 and 2013, households in the bottom 20 percent, in either year, held more debt than assets, on average. As a result, estimated average wealth had negative values. In 2010, estimated average wealth was -\$2,300. In 2013, estimated average wealth was -\$4,700.

Figure 2: Estimated Average and Median Wealth of Older Households by Wealth Quintiles, 1989 to 2016

Average household wealth (in millions of 2016 dollars)



Median household wealth (in millions of 2016 dollars)



^aIn 2010 and 2013, households in the bottom quintile held more debt than assets on average, so average wealth was negative. We estimated it to be about -\$2,300 in 2010 and -\$4,700 in 2013.

^bData were insufficient to produce a reliable estimate for the bottom quintile in 2016.

Source: GAO analysis of 1989 through 2016 Survey of Consumer Finances data. | GAO-19-587

We defined wealth as net worth, or assets minus debt. It includes financial assets and nonfinancial assets, such as home equity and the value of vehicles. It does not include future income expected from Social Security or defined benefit pensions. Averages represent mean estimates. The shaded portions of the figure represent 95 percent confidence intervals; the intervals for some quintiles are less visible because they are very narrow. The Survey of Consumer Finances is conducted every 3 years. Older households are those where the survey respondents or any spouses or partners were aged 55 or older in the year of the survey. We ranked these households by their net worth and broke

them into five equally sized groups, or quintiles. Each year of data in our analysis, and, therefore, each quintile included different sets of households over time. When estimates were not available or had negative values, they were reset to zero for charting purposes.

Recessions and the Retirement Security of Older Americans

Recessions can affect households' resources in various ways. While there were three recessions during the period of our analysis (1990-1991, 2001, and 2007-2009), we were not able to disentangle the direct effects of the recessions on individual households' income and wealth and, therefore, their retirement security. However, research on the 2007-2009 recession spotlights a few examples of how recessions could affect older Americans' retirement security and suggests there could be varying effects across the income and wealth distributions.

For example, others' research shows the 2007-2009 recession affected high-income earners disproportionately because they were more likely to hold riskier assets, such as stocks, and the recession was rooted in a financial crisis. However, even though the effects on wealth may have been disproportionate, the effects may have been felt across the distribution. For example, many families saw their wealth decline during this recession. The decline in housing values surrounding this recession affected many low- and moderate-wealth families as home equity was a large share of their total assets. To the extent that home equity is an important source of wealth for older Americans, declines in housing values could create financial difficulties.

In addition, our prior work has demonstrated that when older workers lose their job, like in a recession, it takes them longer to find another job and this could affect retirement security. In 2012, we found long-term unemployment can put older workers at risk of deferring needed medical care, losing their homes, and accumulating debt. Also, long-term unemployment can substantially diminish an older worker's future retirement income in a couple of ways. First, it can force a worker to stop working and stop saving for retirement earlier than the worker had planned. Second, long-term unemployment can lead individuals to draw down their retirement accounts to cover living expenses while they are unemployed, which was a common life experience described by focus group participants with whom we spoke.

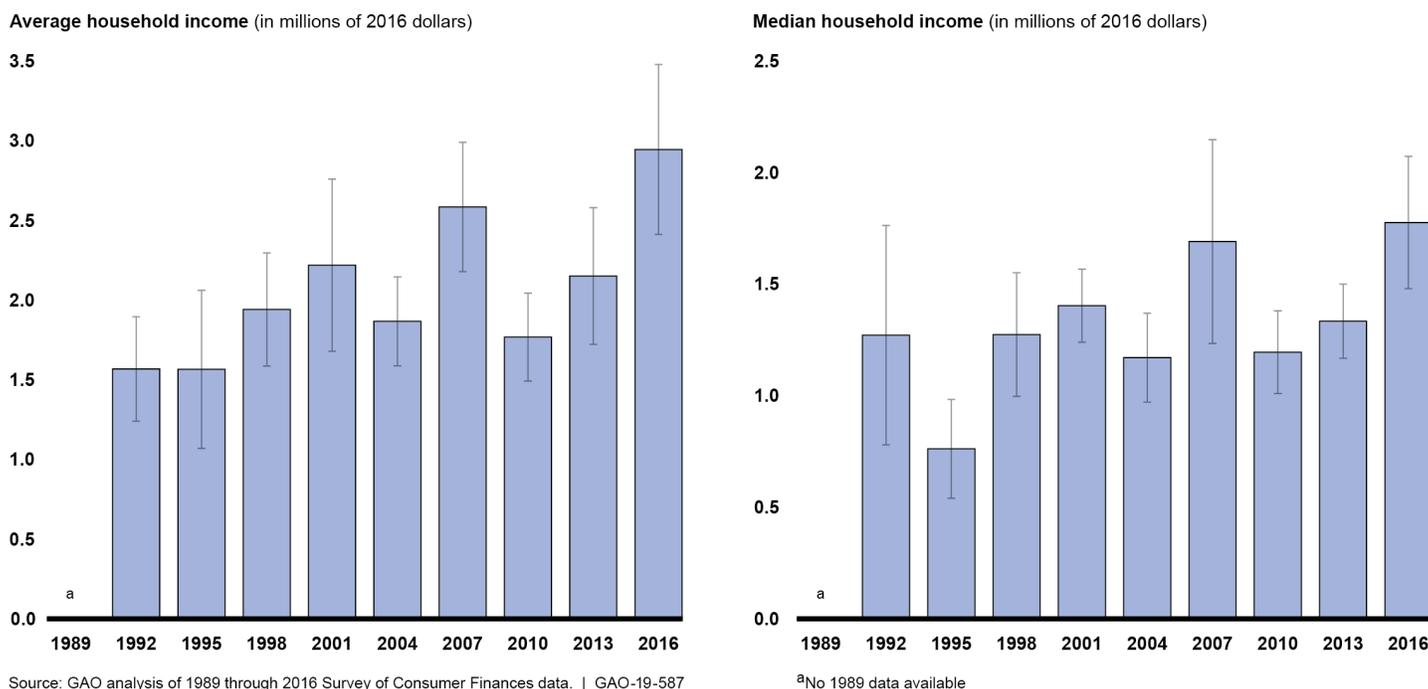
Source: GAO summary of Michael T. Owyang and Hannah G. Shell, "Taking Stock: Income Inequality and the Stock Market," *Economic Synopses*, vol. 2016, no. 7 (St. Louis: Federal Reserve Bank of St. Louis, 2016); Sarah Bloom Raskin, "Downturns and Recoveries: What the Economies in Los Angeles and the United States Tell Us" (remarks at the Luncheon for Los Angeles Business and Community Leaders, Los Angeles Branch of the Federal Reserve Bank of San Francisco, April 12, 2012); GAO, *Unemployed Older Workers: Many Experience Challenges Regaining Employment and Face Reduced Retirement Security*, [GAO-12-445](#) (Washington, D.C.: April 25, 2012); and documents from the Business Cycle Dating Committee of the National Bureau of Economic Research. | GAO-19-587

Within the top quintile, a disproportionate share of income and wealth is held by the top 1 percent compared to the next 19 percent.¹⁴ (See figs. 3 and 4 for average income and wealth of households in the top 1 percent.) For example, we found households in the top 1 percent in 1989 had estimated average wealth that was about \$13 million more than estimated average wealth for households in the next 19 percent (about 10 times as much estimated average wealth). By 2016, households in the top 1

¹⁴For more details on the demographic and financial characteristics associated with the top 1 percent of households, see appendix II. This appendix also contains information on these characteristics for the next 19 percent, the top quintile, the bottom 80 percent, and the bottom quintile.

percent had about \$34 million more in estimated average wealth compared to households in the next 19 percent (about 13 times as much estimated average wealth).¹⁵

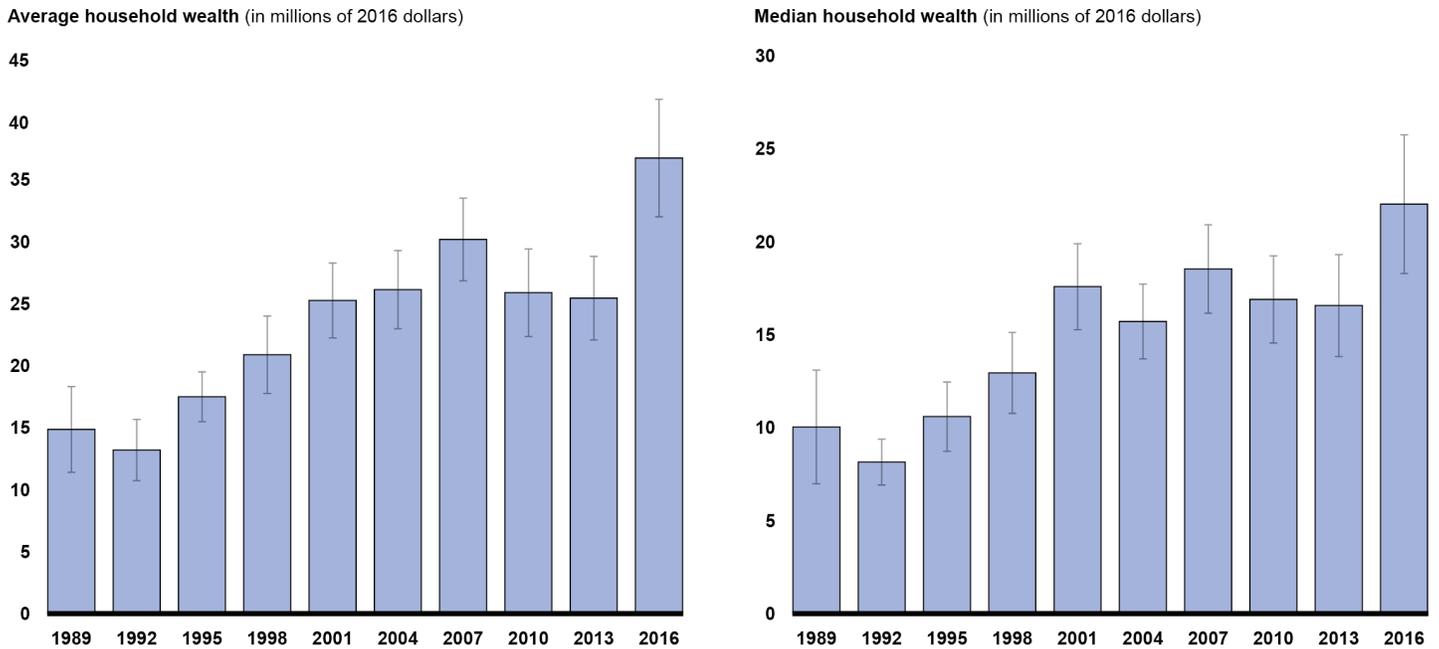
Figure 3: Estimated Average and Median Income of Older Households in the Top 1 Percent of the Income Distribution, 1989 to 2016



Notes: Income is aggregated across all sources, such as wages, Social Security benefits, or withdrawals from retirement accounts. Averages represent mean estimates. The lines overlapping the bars represent 95 percent confidence intervals. The Survey of Consumer Finances is conducted every 3 years. Older households are those where the survey respondents or any spouses or partners were aged 55 or older in the year of the survey. Each year of data in our analysis, and, therefore, the top 1 percent for each year included a different set of households. There were insufficient data to produce reliable estimates for 1989.

¹⁵We also conducted this comparison using median wealth. We found the estimated gap in median wealth between the top 1 percent and the next 19 percent was about \$9 million in 1989 (about 10 times as much wealth). In 2016, this estimated gap was about \$20 million (about 12 times as much wealth).

Figure 4: Estimated Average and Median Wealth of Older Households in the Top 1 Percent of the Wealth Distribution, 1989 to 2016



Source: GAO analysis of 1989 through 2016 Survey of Consumer Finances data. | GAO-19-587

Notes: We defined wealth as net worth, or assets minus debt. Averages represent mean estimates. The lines overlapping the bars represent 95 percent confidence intervals. The Survey of Consumer Finances is conducted every 3 years. Older households are those where the survey respondents or any spouses or partners were aged 55 or older in the year of the survey. Each year of data in our analysis, and, therefore, the top 1 percent for each year included a different set of households.

Retirement Security Provided by Future Social Security and Pension Benefits

Future Income Expected from Social Security and Defined Benefit Pensions

As discussed earlier, researchers studying retirement security often use net worth to measure wealth. However, net worth does not include all of the resources available to older Americans in retirement. Because our analysis looks at income and wealth distributions of older Americans, it was important to consider all possible financial resources to the extent our data sources allowed. Applying methods developed by economists at the Federal Reserve, modified as appropriate for the purposes of our analysis (see app. I for more details), we constructed estimates of the present value of future income expected from Social Security and defined benefit pensions for those older Americans that expect future income from Social Security, defined benefit pensions or both. While adding these present value estimates to wealth better captures the totality of resources available to older Americans (for the purposes of this report, we call this totality “retirement resources”), they are subject to uncertainty in addition to the uncertainty generally associated with using survey data. First, these estimates depend upon two data sources—the Survey of Consumer Finances and the Financial Accounts of the United States—and the Financial Accounts data has its own uncertainties. Second, there is limited information about lifetime earnings in the Survey of Consumer Finances, which are necessary to calculate the present value of both future Social Security and pension benefits. Third, we needed to make assumptions about life

expectancy, real discount rates, and retirement ages, which are unlikely to hold for all households, and which are themselves sources of uncertainty. As a result, we conducted some sensitivity analyses, particularly with respect to discount rates and retirement ages. For reporting purposes, we chose age 62 as the retirement age for the present value calculation of Social Security benefits, similar to the methods applied by economists at the Federal Reserve. It is possible that setting the retirement age at 62 may overstate the present value of future Social Security benefits, depending on various factors including interest rates and mortality. We considered using alternative retirement ages and do not believe that choosing a different retirement age for those not yet retired would substantively change our findings.

Source: GAO analysis. | GAO-19-587

Social Security is the foundation of retirement security in the United States, and along with income from traditional DB pensions, can be particularly important for older households with lower wealth. As discussed in the text box above, some older Americans will expect future income from Social Security, DB pensions or both.¹⁶ We analyzed the present value of these sources for two subsets of older Americans: 1) those who expect future income from Social Security but not DB pensions, and 2) those who expect future income from both Social Security and DB pensions.¹⁷

¹⁶We estimated the percentage of households in each quintile that expected no future income from Social Security or DB pensions, future income from Social Security only, future income from DB pensions only, or future income from both sources. For example, in 2016, about 73 percent of households in the bottom quintile expected future income from Social Security only while 23 percent expected future income from Social Security and DB pensions. The remaining 4 percent expected future income from DB pensions only or no future income from Social Security or DB pensions. For the top quintile, 54 percent of households expected future income from Social Security only while 46 percent expected future income from Social Security and DB pensions.

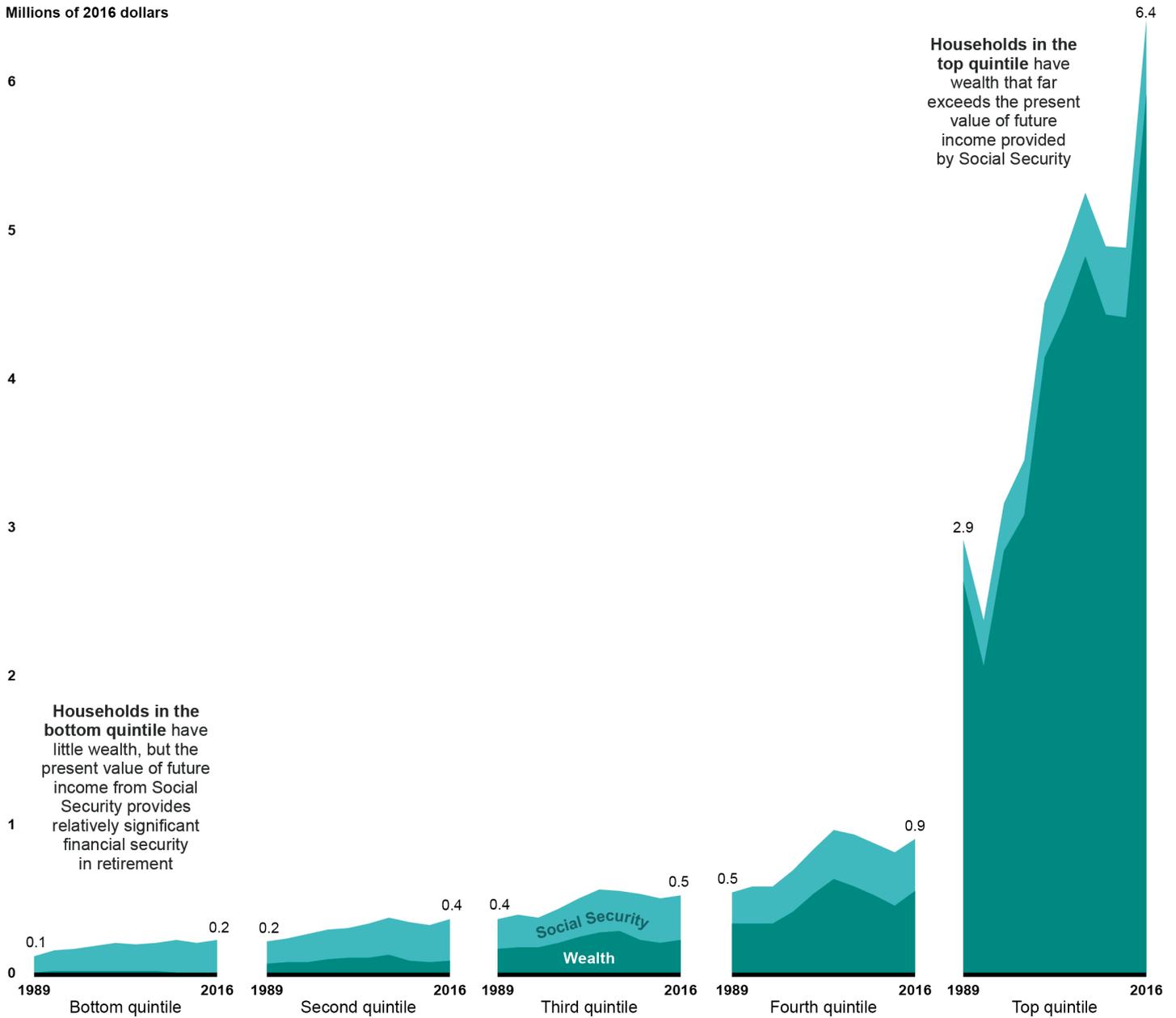
¹⁷We say “estimated present value” because our estimates are based on assumptions about the future, as well as the time value of money, and may not be the actual amount that will be received. For example, as previously discussed, unless changes are made, the Social Security Old Age and Survivors Insurance Trust Fund faces projected depletion in 2034, at which point this Trust Fund is estimated to be sufficient to pay only 77 percent of scheduled benefits. Further, our estimates rely on assumptions about life expectancy, discount rates, and retirement ages, which are unlikely to hold for all households. As a result, we conducted some sensitivity analyses, particularly with respect to discount rates and retirement ages. To produce these estimates, we applied methods developed by economists at the Federal Reserve, with modifications appropriate for the purposes of our analysis. The Federal Reserve economists continue to refine their methodology and we relied on recently available papers as a starting point for our analysis. For more on the Federal Reserve economists’ method, see Devlin-Foltz, Henriques, and Sabelhaus, “Is the U.S. Retirement System Contributing to Rising Wealth Inequality?” (2016). For more information on these methods, including sensitivity analyses we performed to better understand how certain assumptions affected our results, see appendix I.

On average, households with lower wealth,¹⁸ and that expect future income from Social Security but not DB pensions, may receive a significant income stream from future Social Security benefits, according to our analysis of SCF data (see fig. 5). The bottom 20 percent have little in wealth, on average, but the estimated present value of future Social Security benefits provides them relatively significant financial security in retirement. On the other hand, for the top two quintiles, wealth was the most important retirement resource, as households in the top quintile have wealth that, on average, far exceeds the estimated present value of benefits provided by any future Social Security or pension benefits.

¹⁸We defined wealth as net worth (assets minus debt).

Figure 5: Estimated Average Wealth Plus Present Value of Future Income of Older Households Expecting Future Income from Social Security but Not a Pension, 1989 to 2016

Millions of 2016 dollars



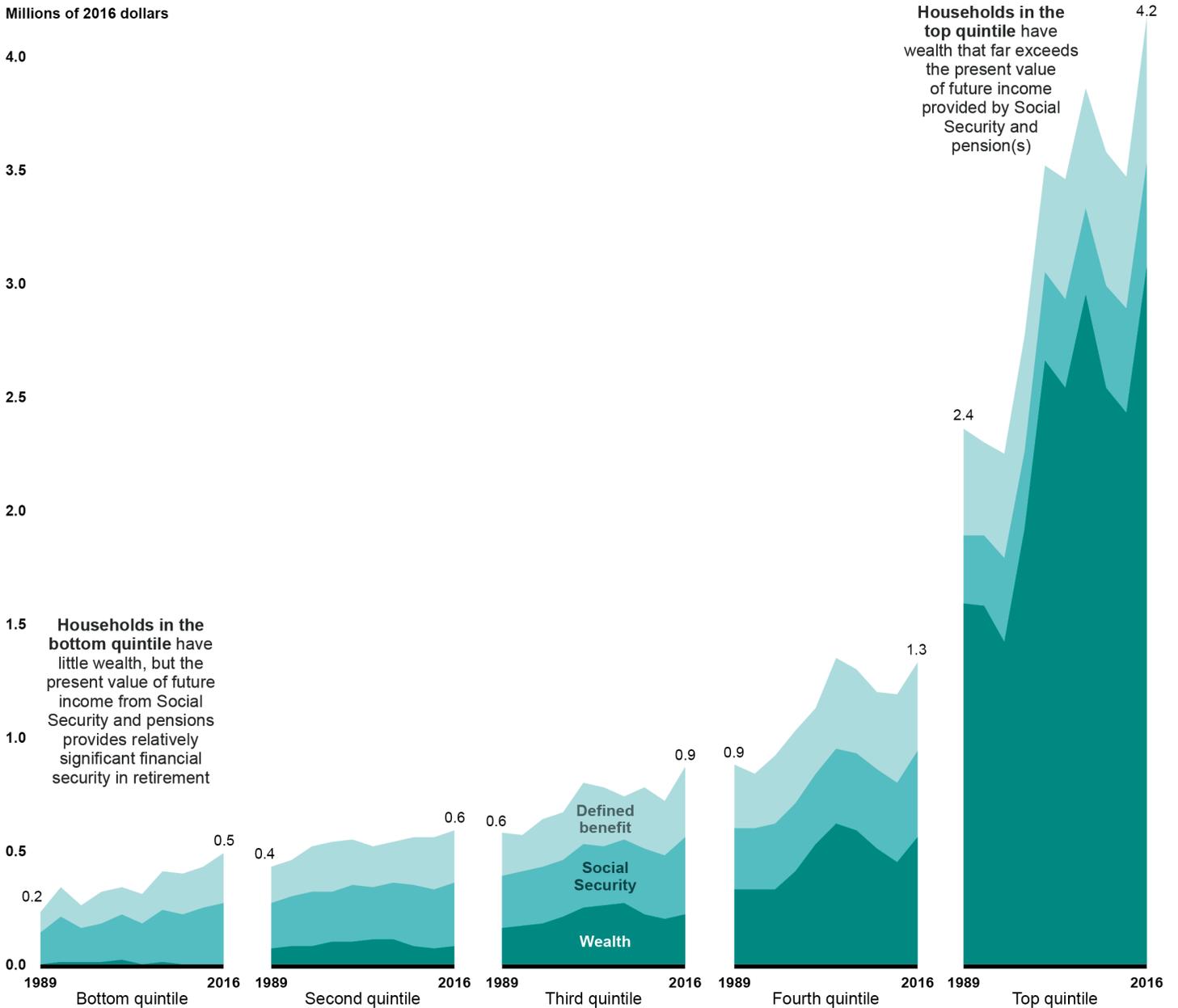
Source: GAO analysis of 1989 through 2016 Survey of Consumer Finances data. | GAO-19-587

Notes: We defined wealth as net worth, or assets minus debt. Averages represent mean estimates. Confidence intervals for these estimates are presented in appendix III. The Survey of Consumer Finances is conducted every 3 years. Older households are those where the survey respondents or

any spouses or partners were aged 55 or older in the year of the survey. We ranked these households by their wealth (net worth) and broke them into five equally sized groups, or quintiles. Each year of data in our analysis, and, therefore, each quintile included different sets of households over time. This figure includes only those households in each quintile that expected to receive future income from Social Security but not defined benefit pensions. For example, in 2016, 73 percent of households in the bottom quintile expected to receive future income from Social Security but not defined benefit pensions. Corresponding percentages for the second through fifth (or top) quintiles were 61, 50, 46, and 54 percent. Average wealth for the bottom quintile was negative (debt was greater than assets) in 2010 and 2013, with values of about -\$4,000 and -\$7,000, respectively. We estimated that, for the bottom quintile, retirement resources (the present value of future income expected from Social Security plus net worth) totaled about \$219,000 in 2010 and \$197,000 in 2013. There were insufficient data to produce an estimate of wealth for the bottom quintile in 2016. When estimates were not available or had negative values, they were reset to zero for charting purposes.

We found similar results for households with lower wealth and that expect future income from Social Security and DB pensions. While the lower quintiles may have little in wealth, on average, they may expect to receive a significant income stream from future Social Security and DB pension benefits (see fig. 6). Wealth was the most important financial retirement resource for the top two quintiles, on average.

Figure 6: Estimated Average Wealth Plus Present Value of Future Income of Older Households Expecting Future Income from Social Security and Pensions, 1989 to 2016



Source: GAO analysis of 1989 through 2016 Survey of Consumer Finances data. | GAO-19-587

Notes: We defined wealth as net worth, or assets minus debt. Averages represent mean estimates. Confidence intervals for these estimates are presented in appendix III. The Survey of Consumer Finances is conducted every 3 years. Older households are those where the survey respondents or any spouses or partners were aged 55 or older in the year of the survey. We ranked these

households by their wealth (net worth) and broke them into five equally sized groups, or quintiles. Each year of data in our analysis, and, therefore, each quintile included different sets of households over time. This figure includes only those households in each quintile that expected to receive future income from Social Security and defined benefit pensions. For example, in 2016, 23 percent of households in the bottom quintile expected to receive future income from Social Security and defined benefit pensions. Corresponding percentages for the second through fifth (or top) quintiles were 38, 49, 54, and 46 percent. There were insufficient data to produce an estimate of wealth for the bottom quintile in 1989, 2004, 2010, 2013, and 2016. When estimates were not available, they were reset to zero for charting purposes.

While disparities remain, the present value of future income expected from Social Security and DB pensions mitigate these disparities to some extent for those households that expected such income, as illustrated by the examples below.

- Estimates for all older households in 2016 that expect future income from Social Security but not DB pensions: Households in the top quintile had, on average, about \$6.1 million in assets, about 272 times as much as the bottom quintile, which had estimated assets of, on average, about \$22,000.¹⁹ When looking at a broader definition of retirement resources (assets plus the present value of future income from Social Security), we estimated that the top quintile had, on average, \$6.6 million in these resources, about 27 times as much as the bottom quintile, which had, on average, about \$241,000.
- Estimates for all older households in 2016 that expect future income from Social Security and DB pensions: Households in the top quintile had, on average, about \$3.2 million in assets, about 61 times as much in assets as the bottom quintile, which had estimated assets of, on average, about \$52,000.²⁰ When looking at a broader definition of retirement resources (assets plus the present value of future income from Social Security and DB pensions), we estimated that the top quintile had, on average, about \$4.3 million in these resources, about

¹⁹We use assets in this example because there were insufficient data to estimate net worth for the bottom quintile of the wealth distribution in 2016. We estimated average net worth of \$5.9 million for households in the top quintile that future income expected from Social Security but not DB pensions. We estimated that, for these households, the combined total of wealth (net worth) plus the present value of future income expected from Social Security was \$6.4 million, on average.

²⁰We use assets in this example because there were insufficient data to estimate net worth for the bottom quintile of the wealth distribution in 2016. We estimated average net worth of \$3.1 million for households in the top quintile that expected future income from Social Security and DB pensions. We estimated that, for these households, the combined total of wealth (net worth) plus the present value of expected future income from Social Security and DB pensions was \$4.2 million, on average.

8 times as much as the bottom quintile, which had, on average, about \$535,000.

Recent research has theorized that benefits expected from Social Security “[go] a long way” to explaining why having little in DC accounts and future income expected from pensions does not necessarily translate into dramatic changes to living standards as people retire.²¹ In particular, the progressivity of Social Security, meaning Social Security benefits replace a higher percentage of pre-retirement earnings for lower-earning households, could be helpful for these households, especially in the absence of other resources, such as retirement accounts.²²

Income and Wealth Disparities
by Demographic
Characteristics

Income and wealth were consistently lower over time for older households headed by someone who was a racial minority,²³ single, or hadn’t attended college, according to our analysis of 1989 through 2016 SCF data.²⁴ (See fig. 7 for an example using the middle quintile.)

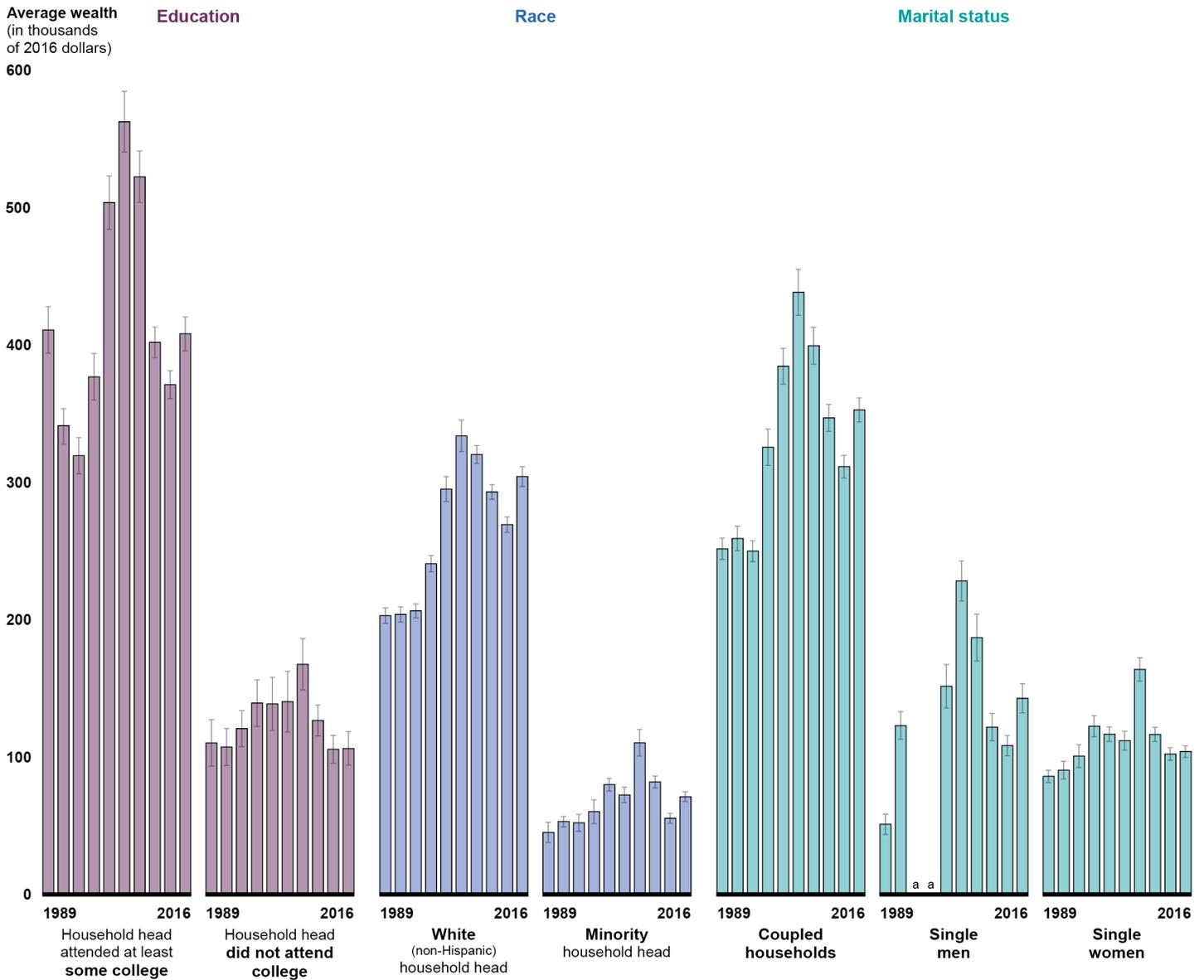
²¹Devlin-Foltz, Henriques, and Sabelhaus (2016).

²²While the Social Security formula remains progressive, our past work found that lower-income groups’ shorter-than-average life expectancy can reduce projected lifetime benefits. See GAO, *Retirement Security: Shorter Life Expectancy Reduces Projected Lifetime Benefits for Lower Earners*, [GAO-16-354](#) (Washington, D.C.: March 25, 2016).

²³For the purposes of this report, minority is defined as someone who is non-white, including those who are black or Asian, or Hispanic. The SCF public data does not allow for disaggregation of non-white households, so we were unable to present data on minority subgroups. As a result, there may be other wealth and income disparities not captured by our analysis.

²⁴The wealth of the top 1 percent pulls up the overall averages for these categories. The vast majority of households in the top 1 percent are headed by someone who attended at least some college, is white and non-Hispanic, and is coupled. See appendix II for more information on the demographic composition of the top 1 percent in 2016.

Figure 7: Estimated Wealth of Older Households in the Middle Quintile of the Wealth Distribution by Race and Ethnicity, Education, and Marital Status, 1989 to 2016



Source: GAO analysis of 1989 through 2016 Survey of Consumer Finances data. | GAO-19-587

^aNo data available

Notes: We defined wealth as net worth, or assets minus debt. Averages represent mean estimates. The lines overlapping the bars represent 95 percent confidence intervals. The Survey of Consumer Finances is conducted every 3 years. Older households are those where the survey respondents or any spouses or partners were aged 55 or older in the year of the survey. We defined minority as someone who is non-white, including those who are black or Asian, or Hispanic. We ranked these

households by their net worth and broke them into five equally sized groups, or quintiles. Each year of data in our analysis, and, therefore, each quintile included different sets of households over time.

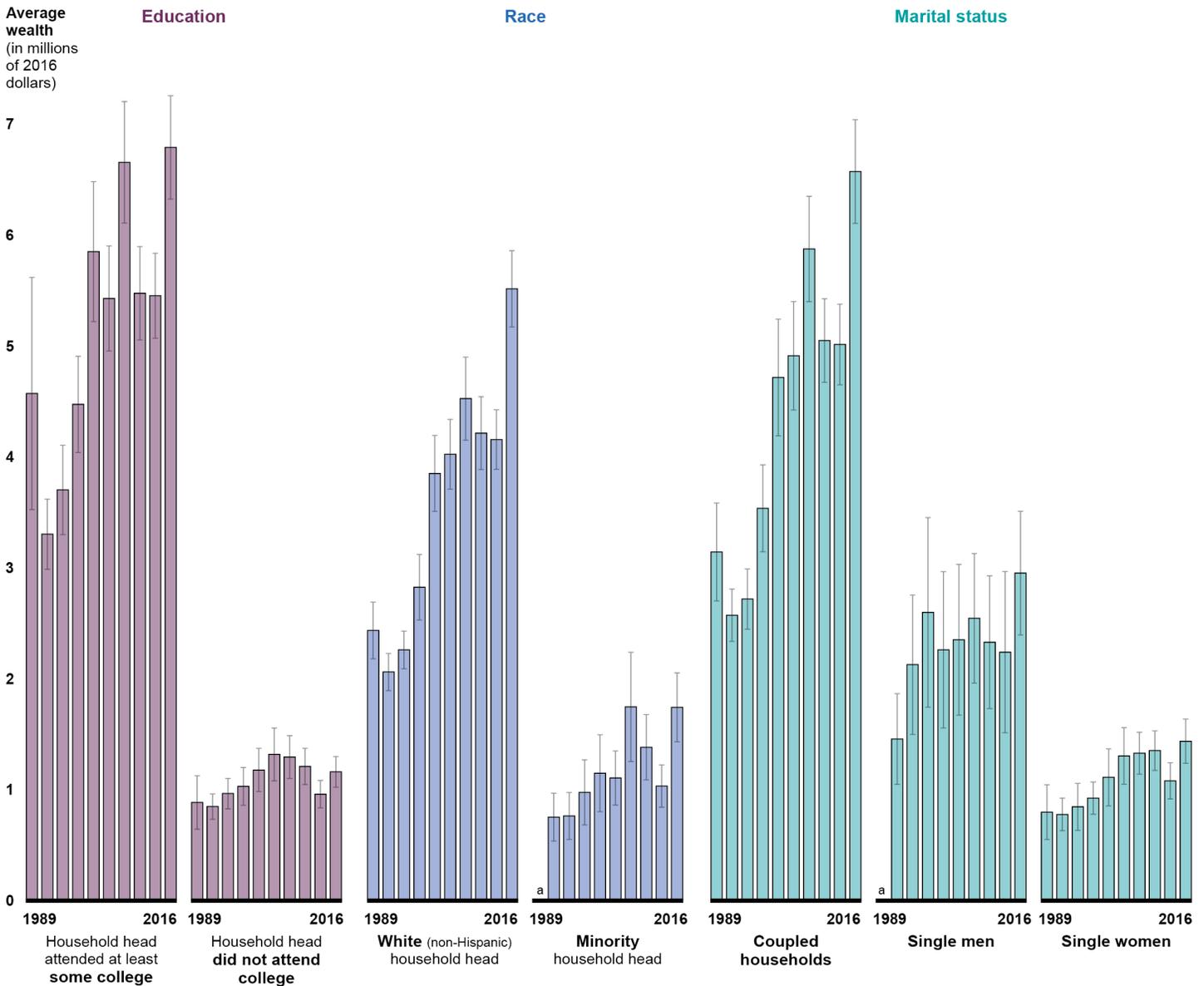
We found these disparities existed across all quintiles and all years (see fig. 8 for another example, this time using the top quintile).²⁵ Generally, the largest disparities from 1989 to 2016 were between 1) households in which the head had not attended college and households in which they had and 2) coupled households and single women. These results are consistent with our prior work, which found that women age 65 and older had less retirement income, on average, and live in higher rates of poverty than men in that age group.²⁶ Disparities were also sizeable for households headed by someone who was white and non-Hispanic compared to those headed by a minority.²⁷

²⁵Household heads who attended college did not necessarily earn a degree.

²⁶GAO, *Retirement Security: Women Still Face Challenges*, [GAO-12-699](#) (Washington, D.C.: July 19, 2012). GAO has forthcoming work with more analysis of women's retirement income security.

²⁷Preliminary research from researchers at the Center for Retirement Research at Boston College estimates that the value of expected future income from Social Security has a mitigating effect on racial and ethnic disparities in wealth. See Hou, Wenliang and Geoffrey T. Sanzenbacher, "Measuring Racial/Ethnic Inequality in Retirement Wealth" (paper presented at the 21st Annual Social Security Administration Research Consortium Meeting, Washington, D.C., Aug. 2019).

Figure 8: Estimated Wealth of Older Households in the Top 20 Percent of the Wealth Distribution by Race and Ethnicity, Education, and Marital Status, 1989 to 2016



Source: GAO analysis of 1989 through 2016 Survey of Consumer Finances data. | GAO-19-587

^aNo 1989 data available

Notes: We defined wealth as net worth, or assets minus debt. Averages represent mean estimates. The lines overlapping the bars represent 95 percent confidence intervals. The Survey of Consumer Finances is conducted every 3 years. Older households are those where the survey respondents or any spouses or partners were aged 55 or older in the year of the survey. We defined minority as someone who is non-white, including those who are black or Asian, or Hispanic. We ranked these households by their net worth and broke them into five equally sized groups, or quintiles. Each year of

data in our analysis, and, therefore, each quintile included different sets of households over time. The wealth of the top 1 percent pulls up the overall averages for these categories. The vast majority of households in the top one percent are headed by someone who attended at least some college, are white and non-Hispanic, and are coupled.

There are multiple reasons why households headed by someone with at least some college education may have more wealth in retirement. Most notably, those with more education may have access to higher-paying jobs and be able to save more. Our review of the literature identified several other theories to explain this association. These include (1) education increases awareness about the need to save, (2) highly-educated individuals may have more financial education and achieve higher rates of return on savings, (3) those with more education may be willing to work longer, and (4) highly-educated individuals may have wealthier parents and thus may have received larger bequests.²⁸ Our prior work has explored how recent trends in marital patterns and saving for retirement, among other factors, can negatively affect retirement security for minorities, women, or those who are single.²⁹

Percentage of Older Households with Retirement Accounts Has Increased Since 1989, Although Non-Retirement Assets Remain Important

The percentage of households with retirement accounts was higher across all wealth quintiles in 2016 compared to 1989, and it was disproportionately higher for the top quintile, according to our analysis of SCF data. In 1989, the percentage of households with retirement accounts—amounts in DC plans and IRAs—ranged from 4 percent of the bottom quintile to 65 percent of the top quintile (see fig. 9). By 2016, 11 percent of households in the bottom quintile had retirement accounts compared to 86 percent of households in the top quintile. These increases reflect the transition to more employers offering DC plans, among other factors.³⁰ Further, the percentage of households in the bottom quintile with retirement accounts had not returned to its pre-

²⁸James Poterba, Steven Venti, and David A. Wise, “Longitudinal Determinants of End-of-Life Wealth Inequality,” *Journal of Public Economics*, vol. 162 (2018); Brookings Economic Studies Program, *Later Retirement, Inequality in Old Age, and the Growing Gap in Longevity between Rich and Poor* (Washington, D.C.: Brookings Institution, 2016).

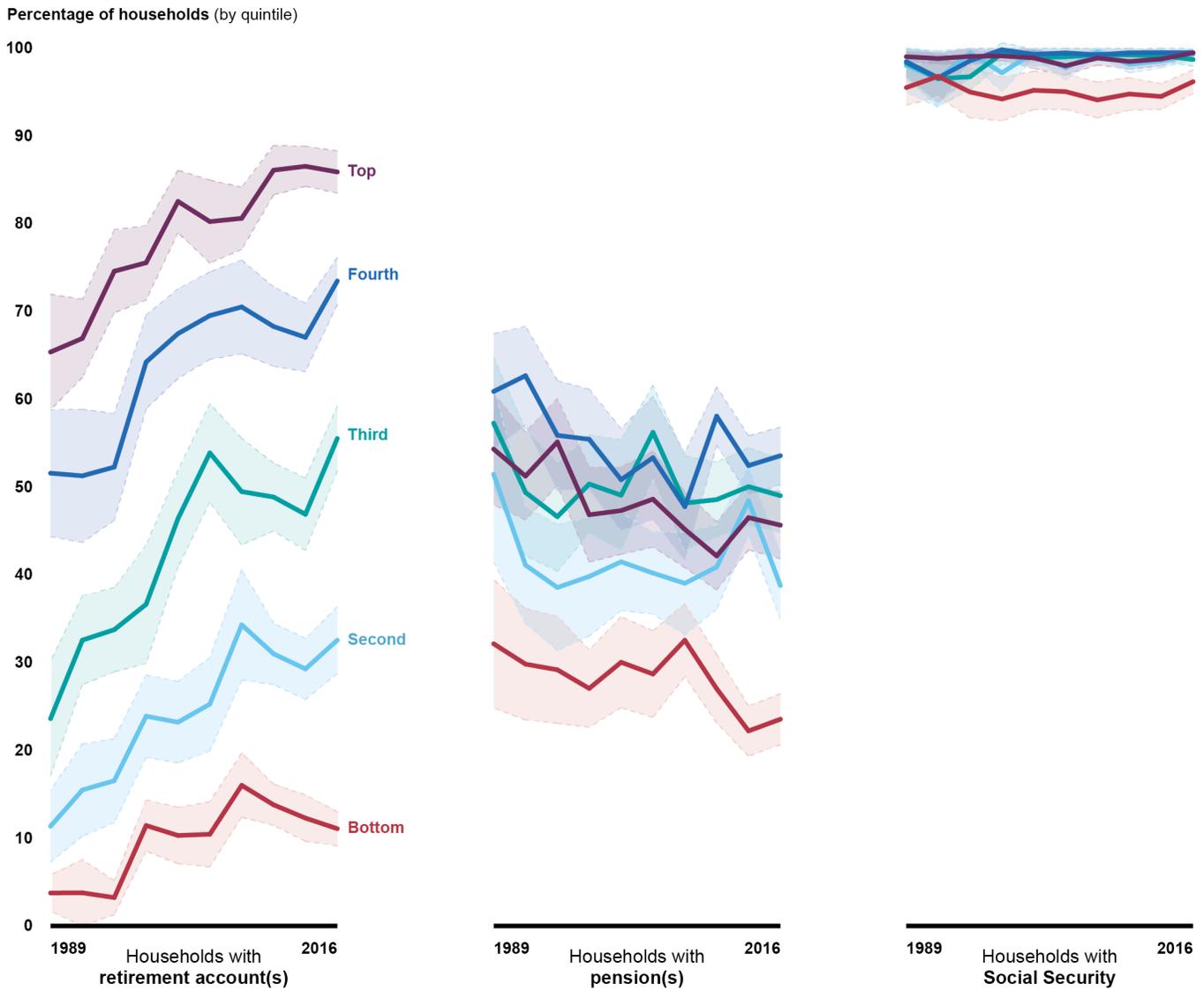
²⁹[GAO-18-111SP](#); GAO, *Retirement Security: Low Defined Contribution Savings May Pose Challenges*, [GAO-16-408](#) (Washington, D.C.: May 5, 2016); and *Retirement Security: Trends in Marriage and Work Patterns May Increase Economic Vulnerability for Some Retirees*, [GAO-14-33](#) (Washington, D.C.: January 15, 2014).

³⁰For more on the transition to more employers offering DC plans, and the rise in assets in DC plans and IRAs, see [GAO-18-111SP](#).

recession rate.³¹ As discussed earlier, households with less wealth may be more reliant on income from Social Security and DB plans.

³¹In 2007, 16 percent of households in the bottom quintile had retirement accounts. This result is statistically significant at the 95 percent confidence level. The difference in the percentage of households with retirement accounts from 2007 to 2016 was not statistically significant for the second through fourth quintiles, although it was statistically significant for the top quintile.

Figure 9: Estimated Percentage of Older Households with Selected Retirement Resources by Wealth Quintiles, 1989 to 2016

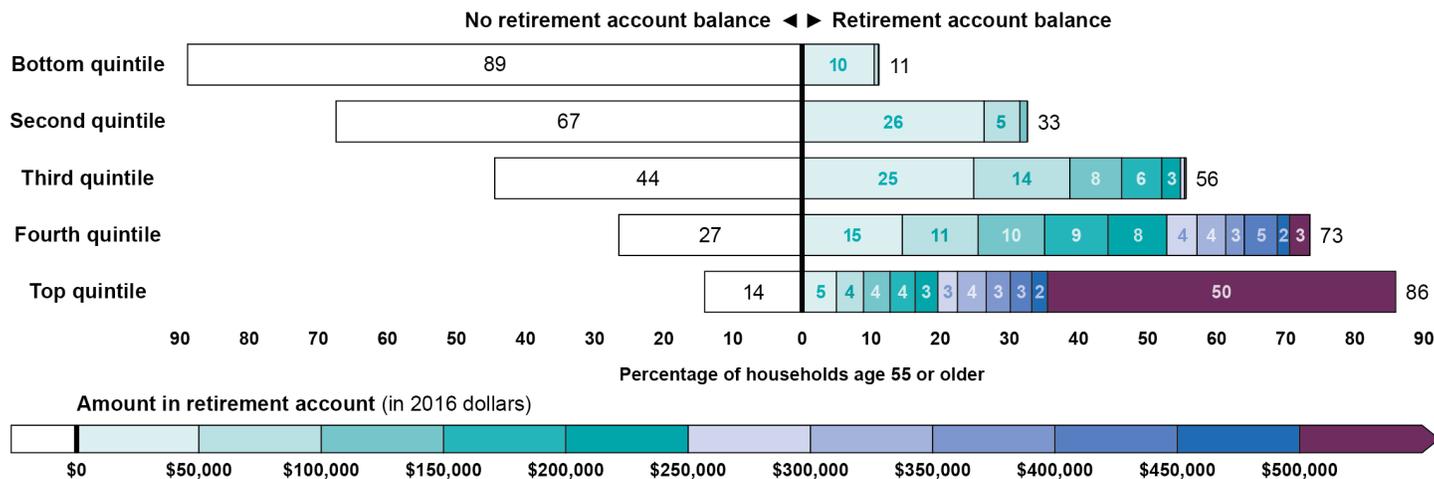


Source: GAO analysis of 1989 through 2016 Survey of Consumer Finances data. | GAO-19-587

Notes: Retirement accounts include DC plans and IRAs. Households with pensions or Social Security are those households that are currently receiving benefits or expect to receive benefits in the future. The percentages in this figure are estimates. The shaded portions of the figure represent 95 percent confidence intervals. The Survey of Consumer Finances is conducted every 3 years. Older households are those where the survey respondents or any spouses or partners were aged 55 or older in the year of the survey. We ranked these households by their net worth and broke them into five equally sized groups, or quintiles. Each year of data in our analysis, and, therefore, each quintile included different sets of households over time.

Further, we found the amount in retirement accounts was often low,³² particularly for the lower quintiles. In 2016, 89 percent of the households in the bottom quintile had no retirement accounts, and another 10 percent had account balances of less than \$50,000 (see fig. 10).³³ In comparison, over half the households in the middle quintile had retirement accounts, and almost all of these households had less than \$200,000 in their accounts.

Figure 10: Estimated Distribution of Average Retirement Account Balances among Older Households by Wealth Quintiles, 2016



Source: GAO analysis of 2016 Survey of Consumer Finances data. | GAO-19-587

Notes: Retirement accounts include DC plans and IRAs. Some households may not have retirement accounts but may have a defined benefit pension. Most older households receive Social Security benefits or expect to receive them in the future. Percentages represent estimates. Confidence intervals for these estimates are presented in appendix III. The Survey of Consumer Finances is conducted every 3 years. Older households are those where the survey respondents or any spouses or partners were aged 55 or older in the year of the survey. We ranked these households by their net worth and broke them into five equally sized groups, or quintiles. Each year of data in our analysis, and, therefore, each quintile included different sets of households over time.

Older Americans may rely on resources other than those discussed above for financial security in retirement (see fig. 11), and these “non-retirement assets” remained important over the time span of our

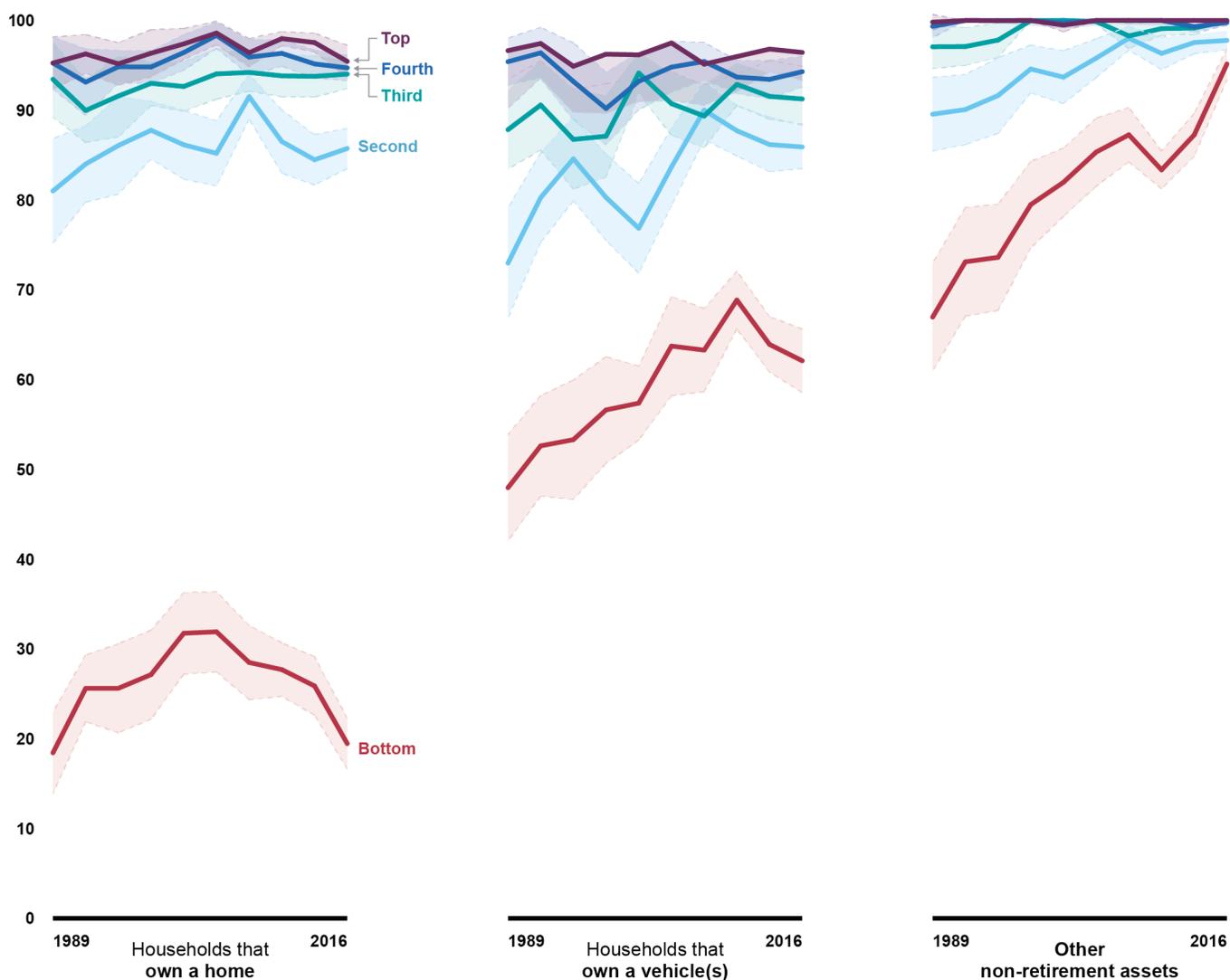
³²Retirement account balances are one of the resources included in our wealth estimates.

³³The average amount in retirement accounts for the bottom quintile, as a whole, was about \$1,300. When we estimated the average amount in retirement accounts for those households in our bottom wealth quintile that had at least \$100 in their accounts, the average increased, to about \$12,000.

analysis,³⁴ regardless of their value relative to retirement account balances or the present value of future income from Social Security or DB pensions.

Figure 11: Estimated Percentage of Older Households with Selected Assets by Wealth Quintiles, 1989 to 2016

Percentage of households (by quintile)



Source: GAO analysis of 1989 through 2016 Survey of Consumer Finances data. | GAO-19-587

³⁴Non-retirement assets are also one of the resources included in our wealth estimates.

Notes: The percentages in this figure are estimates. The shaded portions of the figure represent 95 percent confidence intervals. The Survey of Consumer Finances is conducted every 3 years. Older households are those where the survey respondents or any spouses or partners were aged 55 or older in the year of the survey. We ranked these households by their net worth and broke them into five equally sized groups, or quintiles. Each year of data in our analysis, and, therefore, each quintile included different sets of households over time. For the bottom quintile, the higher percentage of households with all other non-retirement assets in 2016 relative to other years is partly due to the Survey of Consumer Finances including pre-paid debit cards in the survey for the first time in 2016. See Board of Governors of the Federal Reserve System, "Changes in U.S. Family Finances from 2013 to 2016: Evidence from the Survey of Consumer Finances," Federal Reserve Bulletin, vol. 103, no. 3 (Washington, D.C.: September 2017).

- **Home equity.** We estimated that over 80 percent of households in each of the top four quintiles of the wealth distribution owned a home in each year of our analysis. However, the home ownership rate for households in the bottom quintile in each year of our analysis was consistently much lower than for the other quintiles—ranging between 18 and 32 percent. Further, the home ownership rate for households in the bottom 20 percent in 2016 (19 percent) was significantly lower than the home ownership rate for households in the bottom 20 percent in 2007 (28 percent), the starting year for the most recent recession.³⁵ In 2016, the estimated average amount of home equity of households in the bottom quintile was about \$2,000, and \$50,000 for the second-from-the-bottom quintile, compared to about \$118,000 for the middle quintile, about \$208,000 for the fourth (or second-from-the-top) quintile, and about \$559,000 for the top quintile. According to researchers, most households appear to treat a house as a source of reserve wealth that can be tapped in the event of a substantial expense, further pointing to the importance of home ownership for many older Americans.³⁶
- **Vehicles.** A majority of households in each quintile of the wealth distribution owned a vehicle across all years in our analysis, although the bottom quintile had ownership rates that were disproportionately lower. However, despite this, we estimated that vehicles provided higher value, on average, relative to other non-retirement assets for households in the bottom quintile from 2010 onward. For example, in 2016, the estimated average value of vehicles among households in the bottom quintile was about \$7,000 in 2016, compared to estimated

³⁵Differences in the percentage of households that owned a home from 2007 to 2016 were statistically significant at the 95 percent confidence level for the bottom two quintiles. These differences were not statistically significant for the top three quintiles.

³⁶Poterba et al., "The Composition and Drawdown of Wealth in Retirement," *Journal of Economic Perspectives*, vol. 25, no. 4 (2011).

average values of less than \$2,000 in home equity and about \$3,000 in all other non-retirement assets.

- **All-other non-retirement assets.** For the top quintile of households, the average value of these “other assets”—which included stocks, bonds, and other savings outside of retirement accounts,³⁷ among other things—was more than average home equity or the average value of vehicles over the period of our analysis. Estimated average wealth in this other assets category was about \$3.3 million in 2016 for the top quintile.³⁸

Individual income sources and debt were also important factors in older households’ financial security. Researchers have examined the importance of income sources for households and found Social Security is more important for households with lower incomes, while older households with the most income tend to have a diverse range of income sources, such as earnings from financial assets and income from DB plans.³⁹ We found that debt could have a substantial effect on households’ financial security, particularly for the bottom 20 percent. For example, in 2010 and 2013, average net worth for this group was negative because debt was greater than assets.

³⁷Other savings outside retirement accounts includes assets such as savings accounts, checking accounts, money market accounts and, as of the 2016 survey, prepaid cards.

³⁸We also estimated the average value of home equity, vehicles, and all-other non-retirement assets for households in each quintile that had at least \$100 in the asset. The averages were similar to the estimated averages included in these bullet points.

³⁹Anqi Chen, Alicia H. Munnell, and Geoffrey T. Sanzenbacher. “How Much Income Do Retirees Actually Have? Evaluating the Evidence from Five National Datasets,” *Center for Retirement Research Working Paper*, vol. 2018-14 (2018); and Adam Bee and Joshua Mitchell, “Do Older Americans Have More Income Than We Think?” *SESHD Working Paper*, vol. 2017-39 (2017).

A Substantial Number of Older Americans Are Living Into Their Seventies or Early Eighties, Which May Have Implications for Retirement Security

A substantial number of older Americans born from 1931 through 1941 lived into at least their 70s or early 80s, according to our analysis of data on a cohort of people born in these years.⁴⁰ (See text box and app. I for more on how we analyzed Health and Retirement Study (HRS) data on this cohort.) However, this same cohort faced disparities in longevity.⁴¹ Further, our analysis, as well as that of other researchers, found income and wealth each have strong associations with longevity, as do certain demographic characteristics, such as gender and race.⁴² However, even among those with multiple factors associated with a shorter life, such as having lower mid-career earnings and not having attended college, a significant proportion from our cohort were alive in 2014, when they were in their 70s or early 80s. Taken all together, individuals may live a long time, even individuals with factors associated with lower longevity, such as low income or education. Those who live a long time and have little or nothing in DC account balances or pension benefits may have to rely primarily on Social Security or safety net programs.

Analyzing Income, Wealth and Longevity

We examined the association of income and wealth with longevity in a nationally representative sample of Americans born from 1931 through 1941. Throughout this analysis, our references to “older Americans” and “households” apply to that specific subset of older Americans born from 1931 through 1941 and their households. The Health and Retirement Study (HRS) began in 1992 and first surveyed these individuals when they were 51 to 61 years old. The same individuals have been re-interviewed every 2 years since, provided they continued to participate in the survey, and the most recent complete data is from 2014, when those who were still alive were 73 to 83 years old.

We were able to measure deaths over a period of 22 years (1992 through 2014). Every 2 years, the HRS attempted to measure whether the original respondents were still alive, but these longevity data were incomplete because some of the original respondents declined to participate in later waves of the survey. Once these respondents left the survey, their actual longevity could not be followed.

Therefore, we used survival analysis to estimate the proportion of individuals in the 1992 sample alive in 2014. Survival analysis accounts for survey respondents with complete

⁴⁰Our analysis only covers the years up to when members of this cohort reached ages ranging from 73 to 83. Some of these individuals can be expected to live much longer.

⁴¹Since our data and analysis only covers the period when this cohort reached ages ranging from 73 to 83, it is only a partial longevity analysis in that it does not cover longevity beyond those ages. Therefore, our analysis of disparities in longevity within this cohort cannot address the extent to which such disparities might persist beyond these age ranges. While we could use the more technical term “survivorship” to refer to disparities over our observation period, we use the more familiar term “longevity” in this report.

⁴²For details on our review of other researchers’ work and interviews with several of these researchers, see appendix I.

or incomplete longevity data and allowed us to estimate the chance of death by any given time in the observation period. Most importantly, our analysis assumed actual longevity from 1992 to 2014 of the individuals in our analysis did not have a systematic relationship with whether the original HRS respondents continued to participate in the study except that leaving the study implied a later death. We believe this assumption to be reasonable for the purpose of our analysis for two reasons. First, a small percentage (8 percent) of the original respondents dropped out of the survey, so that the impact of any longevity differences among the population who dropped out would likely have been small. Second, while some baseline characteristics of respondents do appear correlated with non-response over time, the population that dropped out of the study does not appear to vary significantly from those completing each wave, except for race and ethnicity. We conducted this analysis, at the individual level, for HRS respondents in 1992, and any spouses or partners also born in 1931 through 1941. Additional details and caveats to this analysis are available in appendix I.

We broke the sample into quintiles based on their income or wealth. To determine an individual's place in the income distribution, we measured mid-career household earnings using administrative records from the Social Security Administration that are linked to the HRS data. Specifically, we defined mid-career household earnings based on average annual earnings reported to the Social Security Administration for years when the survey respondent we identified as the household head was ages 41 to 50 as well as the earnings of their spouse or partner during those years if the respondent was part of a couple in 1992. This measure of earnings provides a relatively stable indicator of the household's labor market experience, compared to using a single year of earnings, which could be unusually high or low. For wealth, we used the household's initial net worth in 1992, including any balances in defined contribution accounts or individual retirement accounts, but excluding second homes, which HRS did not consistently capture in all years. In both instances, the sample was broken into quintiles. For additional details on our methodology, see appendix I.

Source: GAO analysis of 1992 through 2014 HRS data. | GAO-19-587

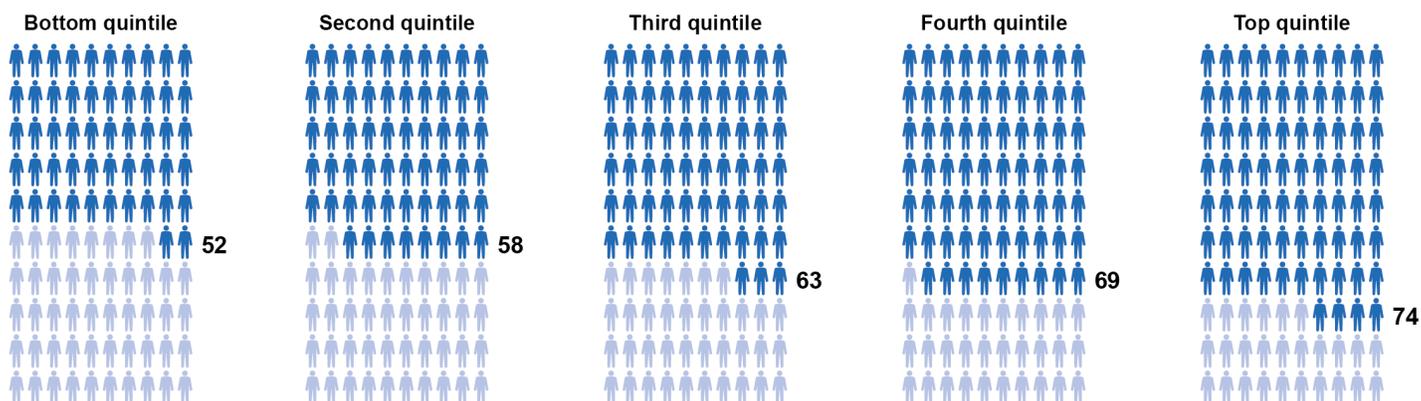
Overall, an estimated 63 percent of the individuals in our sample were alive in 2014 (ages 73 to 83), and greater levels of income and wealth were associated with greater longevity in our analysis of HRS data.⁴³ For income, an estimated 52 percent of individuals from households in the bottom quintile of the mid-career earnings distribution were alive in 2014, compared to an estimated 74 percent of individuals from households in the top quintile. (See fig. 12.) The percentages by wealth quintile were similar.⁴⁴ Other researchers have similarly found that greater levels of income and wealth are associated with greater longevity. For example, a researcher at the Social Security Administration has established that men

⁴³We measured income using our mid-career earnings measure. We measured wealth (defined as net worth) as of 1992, the year the cohort was first interviewed for the HRS.

⁴⁴See appendix IV for results from this analysis.

with higher earnings had seen greater gains in longevity than those with lower earnings.⁴⁵

Figure 12: Estimated Proportion of Older Americans Ages 51 to 61 in 1992 Still Living in 2014, by Mid-Career Household Earnings



Source: GAO analysis of 1992 through 2014 Health and Retirement Study data. | GAO-19-587

Notes: Older Americans included in our analysis were born in 1931 to 1941; they were ages 51 to 61 in 1992 and ages 73 to 83 in 2014. We defined mid-career household earnings based on earnings reported to the Social Security Administration for years when the survey respondents were ages 41 through 50 as well the earnings of their spouses or partners during those years if the respondents were part of a couple in 1992. We ranked these households by their mid-career household earnings and broke them into five equally sized groups, or quintiles. The proportion of individuals alive in 2014 was estimated using a Kaplan-Meier survival analysis. Technical limitations prevented us from calculating confidence intervals. We tested that survival was significantly different between the earnings quintiles by using univariate Cox proportional hazard regressions, which take into account the survey features of the Health and Retirement Study data. The regressions produced hazard ratios, or the risk of dying at a certain time for one group compared to others. We ran five regressions, omitting one of the earnings quintiles in each regression, which allowed us to compare the risk of dying by the end of the survey period for one quintile compared to the other four quintiles. For more details on these methods, see appendix I.

Understanding the association among income, wealth, and longevity is complicated because of relationships among the characteristics, as well as their relationships with demographic characteristics (see text box). Besides income and wealth, several demographic characteristics were

⁴⁵Hilary Waldron, "Trends in Mortality Differentials and Life Expectancy for Male Social Security-Covered Workers, by Socioeconomic Status," *Social Security Bulletin*, vol. 67, no. 3 (2007). Researchers at the Brookings Institution have found longevity to be associated with income and wealth for men and women using two household survey datasets, including the HRS. Barry P. Bosworth and Kan Zhang, "Evidence of Increasing Differential Mortality: A Comparison of the HRS and SIPP," *Center for Retirement Research Working Paper 2015-13* (July 2015).

also associated with longevity in our analysis of HRS data, and these relationships have also been noted in other researchers' studies.⁴⁶

- Women tended to live longer than men: Women had greater longevity through 2014, with an estimated 69 percent living to at least ages 73 to 83 compared to an estimated 58 percent of men.
- Non-Hispanic whites and Hispanics tended to live longer than blacks: For Hispanics, an estimated 68 percent lived to at least 2014, as did an estimated 65 percent of non-Hispanic whites, compared to an estimated 52 percent of non-Hispanic blacks.⁴⁷
- More educated individuals tended to live longer than those with less education: An estimated 75 percent of college graduates lived to at least 2014, compared to an estimated 65 percent of those who graduated from high school and an estimated 50 percent of those with less than a high school diploma or GED.⁴⁸
- Individuals who self-reported being in good health tended to live longer than those who reported being less healthy: Among those who self-reported being in excellent health in 1992, an estimated 78 percent lived to at least 2014, compared to an estimated 31 percent of those who reported being in poor health.

Income, Wealth, and Demographics Are Interrelated

The relationships of income, wealth, and demographics with longevity are complex because of interactions among these characteristics themselves, which make it difficult to determine the direction or extent of causality. For example, there are many potential interactions among educational status, income, and wealth. Higher levels of education could provide access to better job opportunities, increasing income. Education could contribute to greater financial literacy and better financial decision making, increasing wealth. Having access to wealth could make it easier to attain additional education.

⁴⁶See appendix IV for additional results across demographic categories.

⁴⁷In the HRS, race and ethnicity are self-identified. For this analysis, sample sizes were sufficient to break out results by specific race and ethnicity categories. Our results regarding Hispanic longevity are similar to work by other researchers. See S. Jay Olshansky et al., "Differences in Life Expectancy Due to Race and Educational Differences Are Widening, and Many May Not Catch Up," *Health Affairs*, vol. 31, no. 8 (2012) and John M. Ruiz, Patrick Steffen, and Timothy B. Smith, "Hispanic Mortality Paradox: A Systematic Review and Meta-Analysis of the Longitudinal Literature," *American Journal of Public Health*, vol. 103, no. 3 (February 2012).

⁴⁸We relied on the head of household's education level in 1992 for our measure of education.

While income, wealth, and education all are associated with longevity, it is difficult to interpret their individual associations with longevity because of their possible interactions with each other.

Source: GAO analysis of studies included in our literature review. | GAO-19-587

We estimated that individuals whose households were in the top two quintiles (top 40 percent) of the mid-career earnings distribution were more likely than their counterparts in the bottom 60 percent to be alive in 2014 (ages 73 to 83) in an analysis controlling for race and ethnicity, gender, age, education level, and initial self-reported health status on entry into HRS in 1992.⁴⁹ In a similar analysis, we found that individuals from households in the top quintile (top 20 percent) of wealth in 1992 were more likely to be alive than their counterparts in the bottom four quintiles. Our findings are consistent with the work of other researchers who also controlled for such factors. However, such observational studies are only able to demonstrate that a statistical association exists between two characteristics. For example, one study that found a strong association between income and life expectancy specifically notes that unmeasured factors likely affect the association.⁵⁰ Similarly, we cannot determine from our analysis the extent to which income or wealth causes differences in longevity.

Even among individuals with characteristics associated with decreased longevity, a substantial proportion of older Americans lived at least into their 70s or early 80s, according to our analysis of 1992 to 2014 HRS data. For example, we constructed three scenarios to illustrate how longevity varies for those with different mid-career earnings and education.⁵¹ Among those in the “bottom” scenario—those individuals who had no college education and were from households in the bottom 20 percent of the earnings distribution—an estimated 50 percent were still alive in 2014 (see fig. 13).⁵² We estimated that the corresponding percentages for our “middle” scenario and “top” scenario were 65 percent

⁴⁹See appendix IV for more detailed results.

⁵⁰Raj Chetty et al., “The Association Between Income and Life Expectancy in the United States, 2001-2014,” *JAMA*, vol. 315, no. 16 (2016).

⁵¹These scenarios are three possible combinations of earnings and education out of many. They are intended to illustrate how income and demographic characteristics can interact and the potential effects they can have on longevity. In designing these scenarios, we considered the demographic factors discussed above as well as sample size constraints.

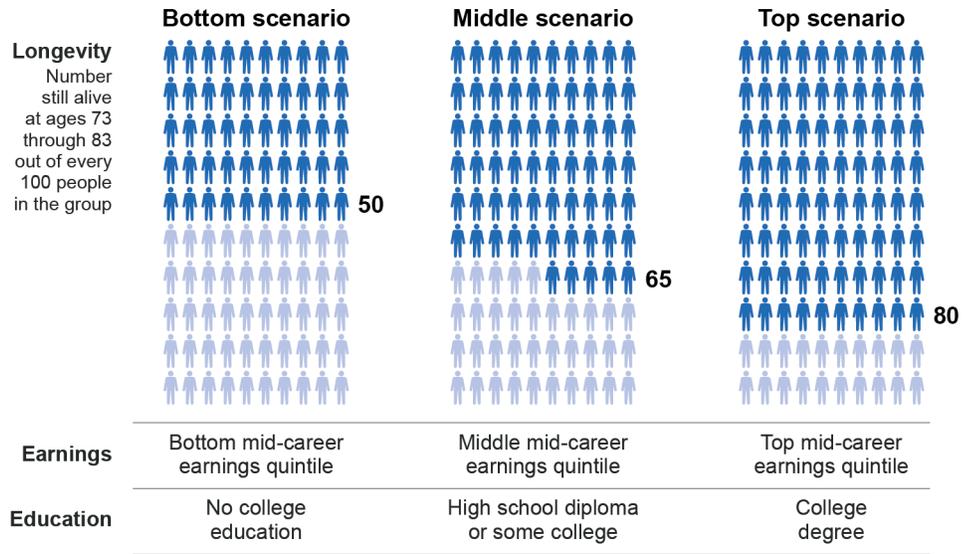
⁵²We used the 1992 data to identify education levels.

and 80 percent, respectively, of individuals still alive in 2014. Thus, even among those with education and earnings associated with lower longevity, a significant proportion, 50 percent, were still alive in 2014, and these individuals will need to provide for themselves through their remaining years.⁵³ We also analyzed a subset of our bottom scenario that included those who had no college education and were from households in the bottom 20 percent of the earnings distribution and whose self-reported health status was fair or poor. While the percentage of the individuals who survived was lower, an estimated 39 percent were alive in 2014, which is a substantial proportion.⁵⁴

⁵³To illustrate remaining life expectancy, for the U.S. population as a whole, men aged 73 in 2014 were expected to live, on average, to age 85.9, and women were expected to live, on average, to age 87.8. For those aged 83 in 2014, men were expected to live, on average, to 90.0 and women were expected to live, on average, to 91.2. We used cohort life tables published by the Office of the Chief Actuary at the Social Security Administration to calculate these estimates. Life expectancies are averages, and a portion of the population can be expected to live well past life expectancy. Since these remaining life expectancies are for the U.S. population as a whole, they would not necessarily apply to the separate education and earnings subgroups just discussed, nor to the separate household earnings quintiles discussed earlier in this section.

⁵⁴Using multivariate Cox proportional hazard regressions, we found that self-reported health status was the strongest predictor of mortality, although we recognize health is interrelated with earnings and wealth.

Figure 13: Estimated Proportion of Those Ages 51 to 61 in 1992 Still Living in 2014, Across Earnings and Education Scenarios



Source: GAO analysis of 1992 through 2014 Health and Retirement Study data. | GAO-19-587

Notes: Older Americans included in our analysis were born in 1931 to 1941; they were ages 51 to 61 in 1992 and ages 73 to 83 in 2014. These scenarios are intended to be illustrative and do not exhaustively represent all possible combinations of education and earnings categories. We defined mid-career household earnings based on earnings reported to the Social Security Administration for years when the survey respondents were ages 41 through 50 as well the earnings of their spouses or partners during those years if the respondents were part of a couple in 1992. We ranked these households by their mid-career household earnings and broke them into five equally sized groups, or quintiles. Health is measured as respondent's self-reported health status in 1992. The proportion of individuals alive in 2014 was estimated using a Kaplan-Meier survival analysis. Technical limitations prevented us from calculating confidence intervals. We tested that survival was significantly different using a multivariate Cox proportional hazard regression, which accounts for the survey features of the HRS data. The regression produced hazard ratios, or the risk of dying at a certain time for one group compared to others, controlling for other factors. We found significant differences in the risk of dying by the end of the survey period between the earnings and education groups. For more details on these methods, see appendix I.

Most individuals have the potential for an unexpectedly long life, including individuals with demographic characteristics associated with lower longevity, income or wealth. In addition, individuals may face major expenses as they age. For example, several experts we spoke with noted that health care costs can pose a particular challenge at older ages. Taken all together, individuals may live a long time and face financial challenges in their later years, including those with less income and wealth.⁵⁵ For example, of the individuals in the bottom group of our

⁵⁵See [GAO-18-111SP](#)

scenarios illustrating the effects of earnings and education on longevity, an estimated 50 percent were still alive in 2014. Should these individuals not have DC accounts or have little in them, or should they have little to no DB pension benefits, they may have to rely primarily on Social Security (which itself faces financing difficulties) or safety net programs.

While Income Disparities Declined As a Cohort of Older Americans Aged and Worked Less, Disparities in Wealth Persisted

Using HRS data and following the same households over time, we examined how income and wealth distributions changed and found that, in general, disparities in income decreased while disparities in wealth persisted among a cohort of older Americans as they aged (see text box for more information on our analysis).⁵⁶ Households with the top 20 percent of mid-career earnings saw larger drops in income than households in other mid-career earnings groups, decreasing income disparities overall. During the same time period, the amount of wealth held by most households remained steady and wealth disparities persisted. We also found important differences in the distribution of income and wealth among households by race and ethnicity and education level.

Analyzing Income and Wealth for Households Over Time

We analyzed Health and Retirement Study (HRS) data to estimate how income and wealth distributions changed as a particular cohort of older Americans aged over time. We analyzed income, wealth, and select financial resources for the same group of survey respondents (heads of households) or their spouses or partners who responded to the survey in 1992 and were still alive and responded in 2014, which is the most recent year for which the data are complete. We defined wealth as net worth. Data limitations prevented us from producing estimates of the present value of future income expected from Social Security or defined benefit pensions. The heads of households we analyzed were from the original HRS cohort and were born in 1931 to 1941. If neither the head of household or the spouse or partner interviewed in 1992 was still alive in 2014, their household was not included in our sample. As a nationally representative longitudinal survey, the HRS allows us to follow the same set of Americans from their 50s through the remainder of their lives; these household heads or their spouses or partners had reached their 70s or early 80s by 2014, allowing us to estimate how income and assets changed for the households as they progressed through retirement. We are reporting medians, as our analysis indicated that means were not consistently reliable. Appendix VI contains additional figures examining how assets and income changed for households headed by individuals in HRS' "War Babies" cohort, who were born from 1942 through 1947.

For our analysis, we divided older households in the data into five equally sized quintiles, or earnings groups, based on the number of households and their mid-career

⁵⁶We followed households from 1992 to 2014, when heads of households were roughly in their 50s to when they or their spouses were in their 70s or early 80s. For the purposes of this analysis, we defined wealth as net worth.

household earnings. We defined mid-career household earnings based on earnings reported to the Social Security Administration for years when the survey respondents were ages 41 through 50, as well the earnings of their spouses or partners during those years if the respondents were part of a couple in 1992. For more on our analysis, see appendix I.

Source: GAO analysis. | GAO-19-587

As described in the textbox above, our analysis included households in which either the head of the household or their spouse or partner were still alive in 2014, and table 1 shows the race and ethnicity and education level of the household head, as well as the composition of the household. As discussed in the previous section, certain demographic characteristics, such as being a minority or being less educated, are associated with a shorter life. However, not everyone with these demographic characteristics will have a shorter life. As the table below shows, there are households in which the head had at least one of these characteristics and lived into his or her 70s or early 80s.

Table 1: Characteristics of Households in the Health and Retirement Study Interviewed in Both 1992 and 2014

Percentage of households	Percentage of total sample		Race or ethnicity of head of household in 2014		Education level of head of household in 2014		Household composition in 2014		
	1992 (base year)	2014 (survivors)	White and non-Hispanic	Racial minority	Attended at least some college	Did not attend college	Coupled	Single men	Single women
Bottom quintile	20	16	11	5	5	10	4	2	10
Second quintile	20	18	13	5	6	12	5	3	9
Third quintile	20	20	16	4	7	13	9	3	8
Fourth quintile	20	22	20	2	10	13	12	4	6
Top quintile	20	24	22	2	16	8	16	2	6
Total	100	100	82	18	44	56	46	14	39

Source: GAO analysis of 2014 Health and Retirement Study (HRS) data. | GAO-19-587

Notes: The original HRS cohort included survey respondents who were born in 1931-1941 and were ages 73 through 83 in 2014. We analyzed the demographic characteristics of those in the original HRS cohort who were still alive, or whose spouses or partners as of 1992 were still alive, and responded to the survey in 2014. We defined minority as someone who is non-white, including those who are black or Asian, or Hispanic. We divided older households in the data into five equally sized groups, or quintiles, based on their mid-career household earnings. We defined mid-career household earnings based on earnings reported to the Social Security Administration for years when the survey respondents were ages 41 through 50, as well the earnings of their spouses or partners during those years if the respondents were part of a couple in 1992. Percentages across the total row within each category may not sum to 100 due to rounding.

Income Disparities Decreased Overall as Higher-Earning Households in Our Cohort saw Drops in Income

We analyzed HRS data and found that household income declined as heads of households born from 1931 through 1941 and their spouses or partners aged, with decreased earnings from work contributing to the decline as people retired.⁵⁷ Those households that had the highest mid-career earnings—those in the top earnings group—experienced the largest declines in income from 1992 when the heads of household were ages 51 to 61 to 2014 when the surviving heads of household or their spouses or partners were ages 73 to 83 (see fig. 14).⁵⁸ For example, estimated median income for the top earnings group decreased by 53 percent, from about \$121,000 in 1992 to about \$57,000 in 2014. In comparison, for those with the lowest mid-career earnings—those in the bottom earnings group—estimated median income declined by 36 percent, from about \$28,000 to about \$18,000 over this same period.⁵⁹

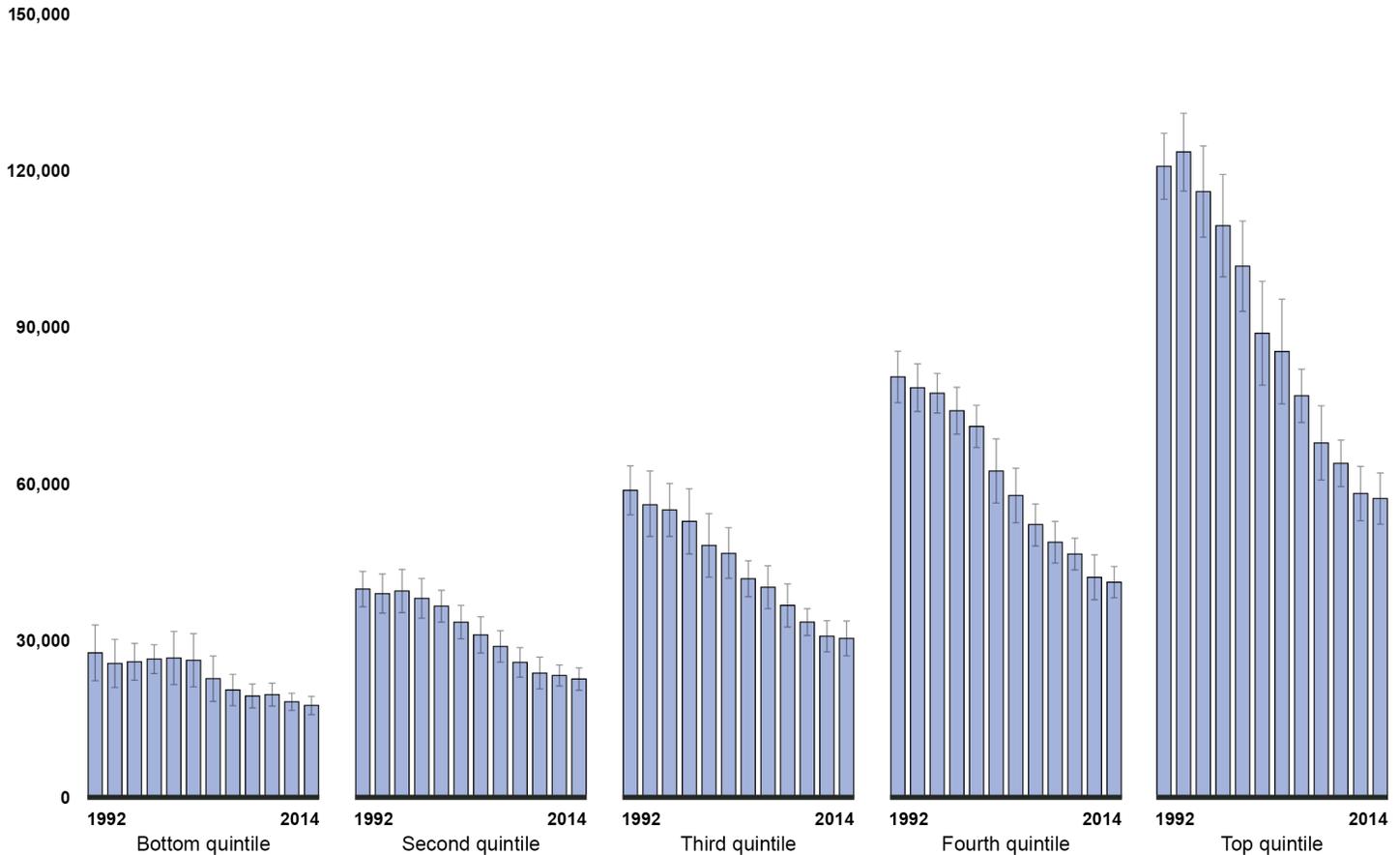
⁵⁷ Appendix VI presents additional figures on how the estimated income and wealth of individuals born in 1942 through 1947, known as HRS's "War Babies" cohort, changed as these individuals aged.

⁵⁸As explained above, our sample included heads of households and their spouses or partners who responded to the HRS survey in 1992 and were still alive in 2014. Our sample included the spouse or partner who responded to the survey in 1992, even if the head of household was no longer alive in 2014. The age of spouses or partners may have been outside the age range of the heads of households.

⁵⁹All values presented in this section of the report are in real 2016 dollars. Throughout this section, we present data on the change in the median value, not the median change.

Figure 14: Estimated Median Household Income for Individuals Born in 1931-1941 and Their Spouses or Partners, as They Aged, by Mid-Career Earnings Level

Median household income (in 2016 dollars)



Source: GAO analysis of 1992 through 2014 Health and Retirement Study data. | GAO-19-587

Notes: Income figures are estimates aggregated across all sources, such as wages, Social Security benefits, or pensions; the lines overlapping the bars represent 99 percent confidence intervals. We ranked households by their mid-career earnings and broke them into five equally sized groups, or quintiles. We defined mid-career household earnings based on earnings reported to the Social Security Administration for years when the survey respondents were ages 41 through 50, as well the earnings of their spouses or partners during those years if the respondents were part of a couple in 1992. We conducted our analysis for households where the heads of household were born in 1931-1941; these individuals were ages 51 through 61 in 1992 and ages 73 through 83 in 2014. All amounts are presented in 2016 dollars. We present estimates of the median amount for each year but not the means due to distributional skew caused by outliers. The Health and Retirement Study is a longitudinal survey that collects information from the same households in their sample every 2 years. See appendix I for details.

The decrease in income disparities may reflect the shift from work-related earnings to Social Security as the largest source of income for

households in the top 20 percent, indicating the possible transition from working to retirement. More specifically, in 1992, 94 percent of households in the top mid-career earnings group had work-related earnings, which contributed the largest amount to their income. By 2014, only 25 percent of the top earnings group still had work-related earnings, and Social Security provided the highest median value of all income sources.⁶⁰ Among households in the bottom mid-career earnings group, 68 percent had work-related earnings in 1992, and 15 percent continued to have work-related earnings in 2014. Similarly, work-related earnings provided the greatest source of income for these households in 1992, and Social Security provided the highest median value of all income sources for these households in 2014. However, concerns about retirement insecurity for those with lower earnings may remain. Social Security is progressive, meaning it replaces a higher percentage of income for those with lower earnings, but the formula for calculating Social Security benefits provides a higher benefit amount to those with higher lifetime earnings. In addition, those households with higher mid-career earnings maintained relatively higher income in retirement, perhaps due to their having higher levels of other types of non-wage income after retiring. For example, in 2014, a significantly greater percentage of households in the top two earnings groups had income from employer-sponsored retirement accounts compared to those in the bottom earnings groups, although households may not be consistent in how they spend down these funds.⁶¹

⁶⁰While this analysis focused on changes in household income over time, our cross-sectional analysis of SCF data discussed previously found that, among all sources of income and wealth, assets excluding retirement accounts, a home, and the value of a household's vehicle(s) provided the most value, on average, for households in the top quintile. These assets were also higher in amount, on average, than the present value of future income from Social Security and DB pensions.

⁶¹Unlike Social Security or DB pension income, individuals manage their withdrawals from defined contribution accounts and IRAs and determine how to spend down their account balances. For example, individuals may spend down their defined contribution account balances through lump sum payments, programmed withdrawals, annuities, or possibly some combination thereof. Or, they may choose to hold their account balances in reserve, withdrawing only what the law requires. As a result, some households may use their account balances in response to short-term spending needs rather than using their savings as an ongoing source of income.

Wealth Remained Steady for Most Households in Our Cohort, and Disparities Persisted

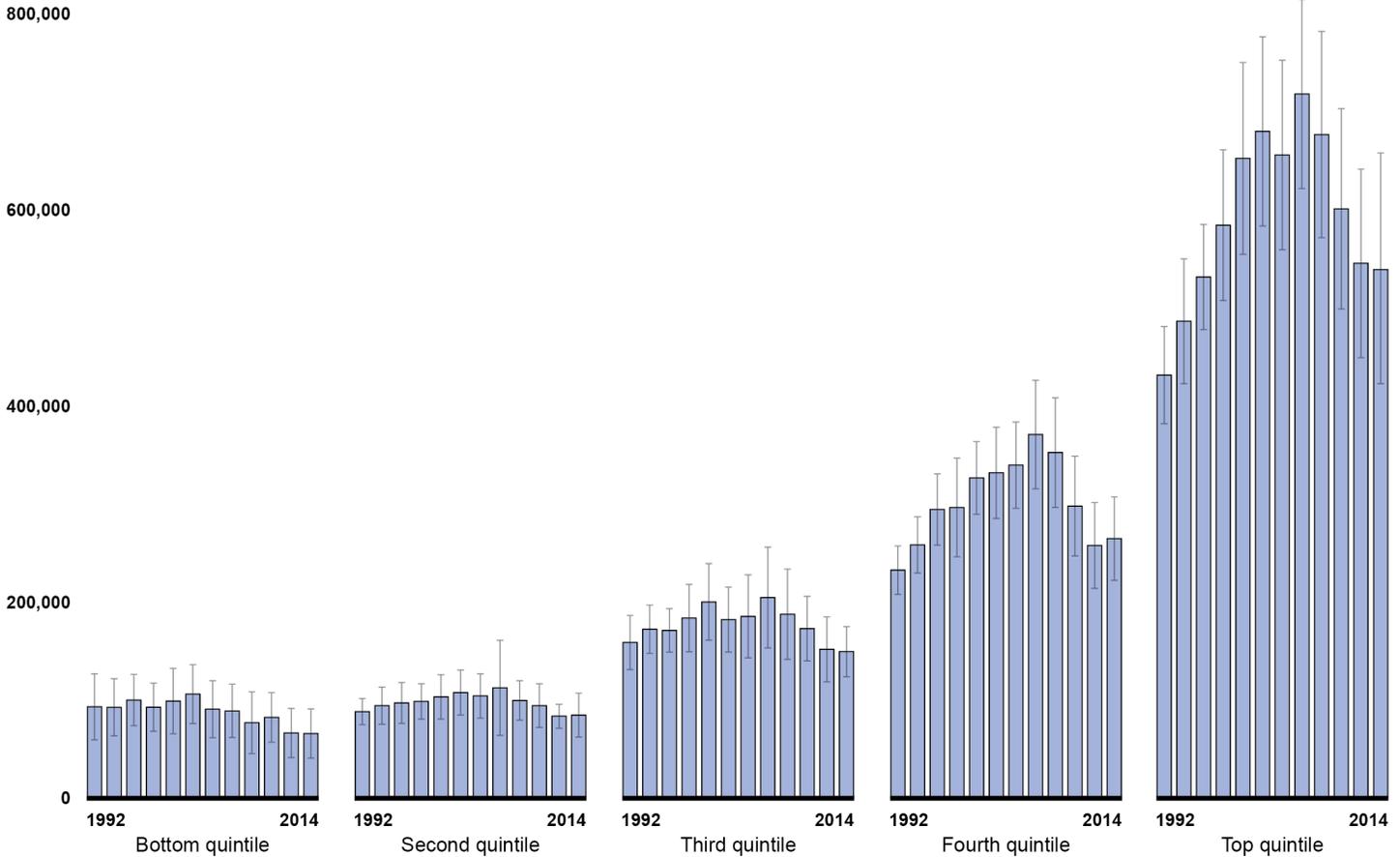
We analyzed HRS data from 1992 to 2014—when heads of households were in roughly their 50s to when they were in their 70s or early 80s—and found that for most households, the level of wealth was relatively consistent as they aged, and disparities in wealth persisted over time. As shown in figure 15, wealth remained relatively steady for households in the bottom three mid-career earnings groups over the time period we examined while households in the top two mid-career earnings groups experienced larger fluctuations in wealth. More specifically, households in the top two earnings groups saw their wealth increase overall from 1992 to 2014. However, while wealth increased from 1992 to 2006, this was followed by declines in wealth from 2006 to 2014.⁶² Looking at the overall time period of our analysis, wealth disparities persisted between households in the top earnings groups and households in the bottom earnings groups. For example, in 1992, households in the bottom 20 percent had estimated median wealth of about \$93,000 while households in the top 20 percent had estimated median wealth of about \$432,000, a difference of about \$339,000 (or the top had about 4.6 times the median wealth of the bottom). In 2014, households in the bottom 20 percent had estimated median wealth of about \$66,000 while households in the top 20 percent had estimated median wealth of about \$539,000, a difference of about \$473,000 (or the top had about 8.2 times the median wealth of the bottom). Other researchers have found that that some households may not spend down their wealth as much during retirement due to factors including a generally higher propensity to save, a desire to leave bequests, and the desire to self-insure against medical costs.⁶³

⁶²The overall increase in wealth from 1992 to 2014 was not statistically significant. The increase in wealth from 1992 to 2006 for households in the top 20 percent was statistically significant, and declines in wealth from 2006 to 2014 were not statistically significant.

⁶³Poterba et al., “Longitudinal Determinants”; Sudipto Banerjee, “Asset Decumulation or Asset Preservation? What Guides Retirement Spending?,” Employee Benefit Research Institute Issue Brief No. 447 (2018); and Karen Smith, Mauricio Soto and Rudolph G. Penner, “How Seniors Change Their Asset Holdings During Retirement,” Center for Retirement Research at Boston College Working Paper, vol. 2009, no. 31 (2009).

Figure 15: Estimated Median Household Wealth for Individuals Born in 1931-1941 and Their Spouses or Partners, as They Aged, by Mid-Career Earnings Level

Median household wealth (in 2016 dollars)



Source: GAO analysis of 1992 through 2014 Health and Retirement Study data. | GAO-19-587

Notes: For this analysis, we defined wealth as net worth. This definition includes nonfinancial assets, such as home equity and the value of vehicles, in addition to financial assets. It does not include future income expected from Social Security or defined benefit pensions. Wealth figures are estimates; the lines overlapping the bars represent 99 percent confidence intervals. We ranked households by their mid-career earnings and broke them into five equally sized groups, or quintiles. We defined mid-career household earnings based on earnings reported to the Social Security Administration for years when the survey respondents were ages 41 through 50, as well as the earnings of their spouses or partners during those years if the respondents were part of a couple in 1992. We conducted our analysis for households where the heads of household were born in 1931-1941; these individuals were ages 51 through 61 in 1992 and ages 73 through 83 in 2014. All amounts are presented in 2016 dollars. We present estimates of the median amount for each year but not the means due to distributional skew caused by outliers. The Health and Retirement Study is a longitudinal survey that collects information from the same households in their sample every 2 years.

Shifts in the Type of Retirement Plans

Over the past 40 years, there has been a significant shift in the type of retirement plans offered by private-sector employers, who have increasingly moved away from offering defined benefit plans to offering defined contribution plans (e.g., 401(k)s) as their primary retirement plan. In addition, there has been a significant increase in the amount of assets held in defined contribution plans and individual retirement accounts (IRAs). In the private sector, total assets in defined contribution plans and IRAs far exceed those in defined benefit plans. As a result, individuals have greater responsibility for making investment decisions. Given the shift away from defined benefit plans, our analysis on retirement accounts focused on defined contribution accounts and IRAs, and Keogh accounts (for self-employed individuals). In addition, we focused on those who had these retirement accounts rather than all households in order to better capture the experience of those who had these accounts.

Source: GAO analysis. | GAO-19-587

Households in the top 20 percent of mid-career earnings had greater participation in retirement accounts (see sidebar) and increased home equity relative to other households, which may have contributed to wealth disparities over the time period of our analysis.

- **Retirement Accounts.**⁶⁴ Among households that had retirement accounts, the median value of retirement accounts increased for all of our income groups (see fig. 16); however, the continued wealth disparities between higher- and lower-earning households may be due to significant differences in the value of retirement accounts and in household participation. The value of retirement accounts for households in the top and bottom earnings groups increased substantially between 1992 and 2014 (a 93 percent and 138 percent increase, respectively). Some of the increase in retirement account balances over time may be due to contributions to DC plans and IRAs during years in which individuals worked, as well as waiting until age 70 ½, when many individuals are required to take minimum distributions from their IRAs.⁶⁵ Despite this potential for gains in account balances across the distribution, disparities still exist. In 2014, among households that had retirement accounts, we estimated that households in the top 20 percent had about three times more in their retirement accounts compared to households in the bottom 20 percent (about \$176,000 compared to about \$54,000). Higher-earning households may not spend down their retirement account balances as much in retirement whereas lower-earning households may have spent down all or part of their account balances. In addition to having more in their retirement accounts, a greater percentage of households in the top earnings group had retirement accounts compared to households in the bottom earnings group. For example, in 2014, an estimated 69 percent of households in the top 20 percent had

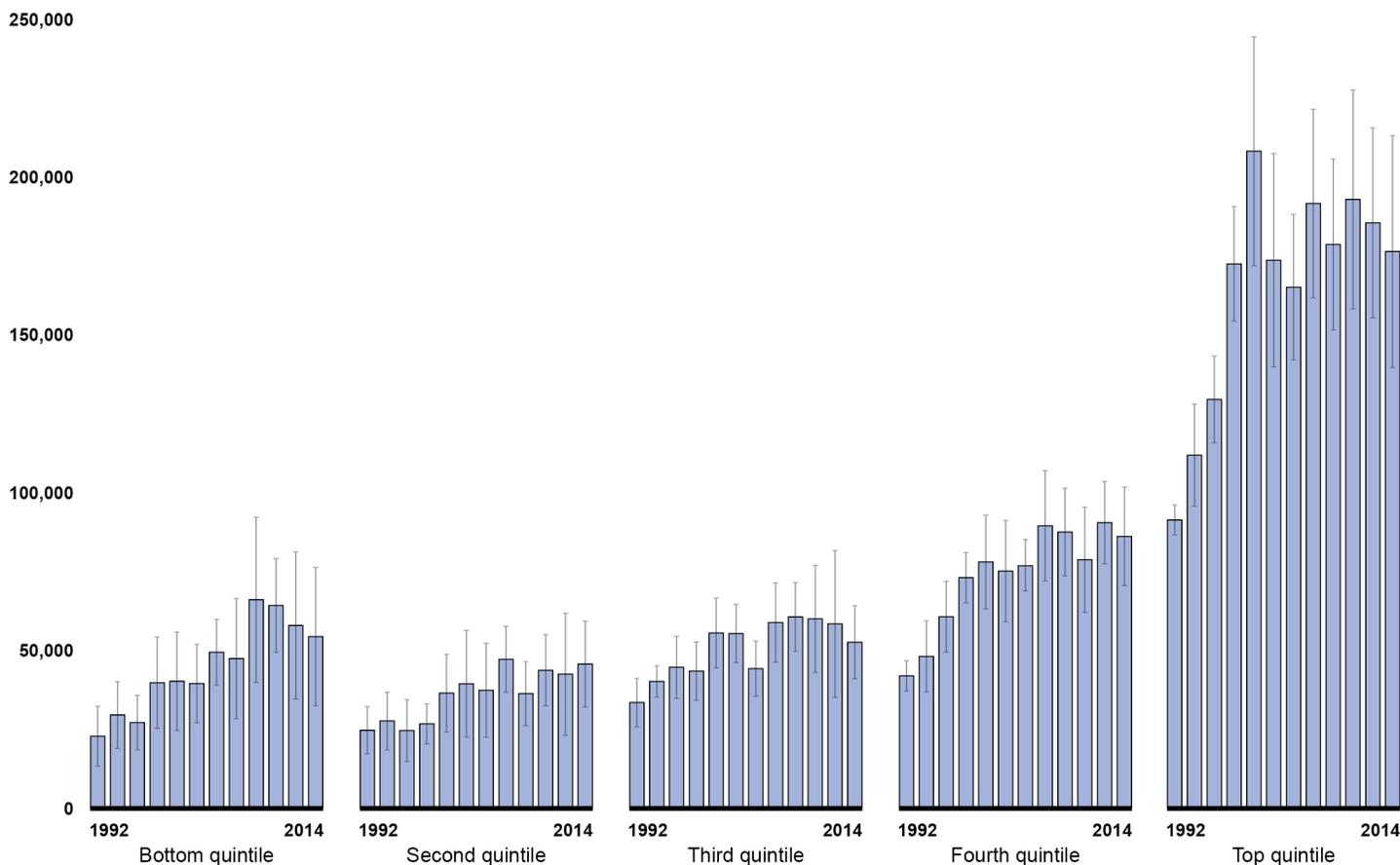
⁶⁴We included employer-sponsored defined contribution plans, individual retirement accounts (IRAs), and Keogh accounts when calculating retirement account balances. This measure does not include any future income streams from DB pension plans.

⁶⁵James M. Poterba “Retirement Security in an Aging Population,” *The American Economic Review*, Vol. 104, No. 5 (2014) and Smith et al. (2009).

retirement accounts compared to an estimated 19 percent of households in the bottom 20 percent.⁶⁶

Figure 16: Estimated Median Retirement Account Balances for Households with Retirement Accounts as Individuals Born in 1931-1941 and Their Spouses or Partners Aged, by Mid-Career Earnings Level

Median household retirement account balance(s) (in 2016 dollars)



Source: GAO analysis of 1992 through 2014 Health and Retirement Study data. | GAO-19-587

⁶⁶There are several reasons why low-income workers may have lower account balances over their careers. For example, we previously reported that low-income workers are less likely to have access to an employer-sponsored plan. In other cases, they may be less likely to participate in the plan because of income constraints. Finally, to the extent that low wage workers have more intermittent employment, they may forfeit employer contributions to their retirement accounts due to vesting rules. While these individuals can contribute to IRAs, they may not do so because they have to take more action on their own to enroll and contribute, and the contribution limits are lower than for 401(k) type plans. See [GAO-18-111SP](#).

Notes: Retirement accounts include IRAs and defined contribution accounts. They do not include the present value of future income expected from defined benefit pension plans. Retirement account balances are estimates; the lines overlapping the bars represent 99 percent confidence intervals. We ranked households by their mid-career earnings and broke them into five equally sized groups, or quintiles. We defined mid-career household earnings based on earnings reported to the Social Security Administration for years when the survey respondents were ages 41 through 50, as well the earnings of their spouses or partners during those years if the respondents were part of a couple in 1992. We conducted our analysis for households where the heads of household were born in 1931-1941; these individuals were ages 51 through 61 in 1992 and ages 73 through 83 in 2014. All amounts are presented in 2016 dollars. We present estimates of the median amount for each year but not the means due to distributional skew caused by outliers. The Health and Retirement Study collects information from the same households in their dataset every 2 years.

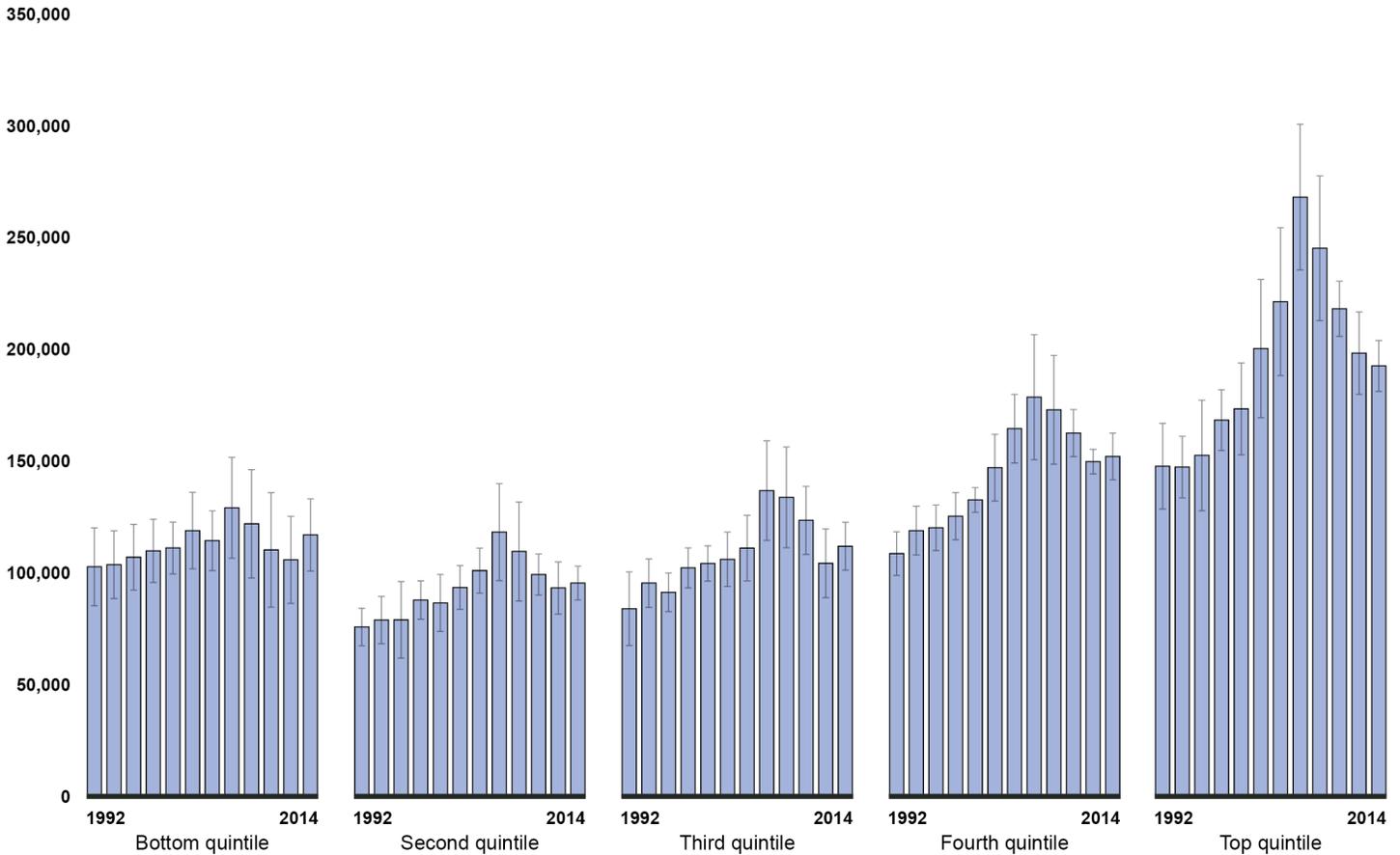
- Home equity.⁶⁷ From 1992 to 2014, home equity increased across all mid-career earnings groups for households with home equity; however, households in the top two earnings groups saw greater increases in the value of their home equity compared to households in the bottom two earnings groups (see fig. 17). Over this time period, a greater percentage of households in the top 20 percent had home equity compared to households in the bottom 20 percent. More specifically, from 1992 to 2014, the percentage of households in the bottom 20 percent with home equity ranged from an estimated 61 percent to 70 percent. For the top 20 percent, the percentage of households with home equity ranged from 88 to 94 percent. Despite the recession from 2007 to 2009, which may have caused home values to depreciate, median home equity for households in the top 20 percent that had home equity increased by an estimated 30 percent from 1992 to 2014. At the same time, median home equity for the bottom 20 percent of households with home equity increased by an estimated 14 percent, though this change was not statistically significant.⁶⁸ One expert we interviewed also noted recent real estate appreciation as benefiting wealthier retirees.

⁶⁷Home equity refers to the value of the primary residence minus mortgages and home loans. Similar to our analysis of retirement accounts, we focused on households with home equity to better capture the change over time.

⁶⁸The appreciation in home equity may also be related to geographic location of a home.

Figure 17: Estimated Median Value of Home Equity for Households with Home Equity, as Individuals Born in 1931-1941 and Their Spouses or Partners Aged, by Mid-Career Earnings Level

Median home equity (in 2016 dollars)



Source: GAO analysis of 1992 through 2014 Health and Retirement Study data. | GAO-19-587

Notes: Home equity refers to the value of the primary residence minus mortgage and home loans. Home equity values are estimates; the lines overlapping the bars represent 99 percent confidence intervals. We ranked households by their mid-career earnings and broke them into five equally sized groups, or quintiles. We defined mid-career household earnings based on earnings reported to the Social Security Administration for years when the survey respondents were ages 41 through 50 as well the earnings of their spouses or partners during those years if the respondents were part of a couple in 1992. We conducted our analysis for households where the heads of household were born in 1931-1941; these individuals were ages 51 through 61 in 1992 and ages 73 through 83 in 2014. All amounts are presented in 2016 dollars. We present estimates of the median amount for each year but not the means due to distributional skew caused by outliers. The Health and Retirement Study collects information from the same households in their dataset every two years.

Race and Ethnicity and Education Were Factors in Persistent Income and Wealth Disparities As Households in Our Cohort Aged

Race and Ethnicity

Significant differences in income and wealth associated with race and ethnicity, as well as education levels, continued as households aged, according to our analysis of heads of households and their spouses or partners as they aged from roughly their 50s to their 70s or early 80s using 1992 through 2014 HRS data.

Non-Hispanic, white households in the bottom 40 percent of mid-career earnings had higher estimated median incomes, and non-Hispanic, white households across the mid-career earnings distribution generally had greater wealth, than minority households.⁶⁹

- In terms of income, the gap between non-minority and minority households in the bottom 40 percent persisted even as median income decreased overall for households as they aged. For example, we estimated that, in 1992, non-Hispanic, white households in the bottom 20 percent had about \$20,000 more in income than minority households. The income disparity was smaller (about \$9,700) in 2014, but still remained.⁷⁰
- In terms of wealth, non-Hispanic, white households had persistently higher wealth compared to minority households across all levels of the mid-career earnings distribution. For example, among the bottom 20 percent of households, in 1992, non-Hispanic, white households had about \$138,000 more in estimated median wealth than minority households. While this difference decreased to about \$119,000 in 2014, the wealth difference remained. Similarly, for the top 20 percent of households, in 1992, non-Hispanic, white households had about \$170,000 more in estimated median wealth than minority households, and, in 2014, the wealth disparity increased to about \$294,000.

⁶⁹We defined minority as someone who is non-white, including those who are black or Asian, or Hispanic. For the purposes of this analysis, the data were insufficient for breaking out results by specific race and ethnicity categories, so we were unable to present data on minority subgroups. As a result, there may be other wealth and income disparities not captured by our analysis. Additional estimates from this analysis are presented in appendix III.

⁷⁰We did not find significant differences in income between minority and non-minority households at the higher end of the mid-career earnings distribution; for our analysis, the number of minority households in this group was too small to draw conclusions.

Education

Households headed by someone with at least some college education generally had higher median incomes and more wealth than households headed by someone who did not attend college.

- Income disparities existed across the mid-career earnings distribution from 1992 to 2014. For example, we estimated that, in 1992, households in the top 20 percent with heads who attended college had about \$44,000 more in income compared to households in the top 20 percent with heads who did not attend college. We estimated that, in 2014, households with heads in the top 20 percent who had attended college still had greater income, though the difference was smaller (about \$25,000). Similarly, heads of households in the bottom 20 percent who had attended some college had more income than heads of household who had not. For example, in 1992, households with heads who had attended some college had about \$31,000 more in income than households with heads who had not, and that difference decreased to \$9,700 in 2014.⁷¹
- Wealth disparities generally existed across the mid-career earnings distribution over time. For example, in 1992, households in the top 20 percent with heads who had attended some college had about \$166,000 more in estimated median wealth compared to households in the top 20 percent with heads who did not attend college. In 2014, the difference in estimated median wealth between these same groups was about \$386,000. Similarly, households in the bottom 20 percent with heads who had attended some college had greater median wealth than households in the bottom 20 percent with heads who had not attended college. For example, we estimated that, in 1992, households in the bottom 20 percent with heads who attended college had about \$176,000 more in wealth than heads who had not. In 2014, the difference in median wealth between these groups was about \$120,000.⁷² Our findings are consistent with those of other researchers, who found that educational attainment was an important determinant of wealth at age 65, and that it was strongly correlated with wealth even after controlling for lifetime earnings.⁷³

⁷¹The difference in median income in 2014 was not statistically significant.

⁷²This difference was not statistically significant.

⁷³Poterba et al., "Longitudinal Determinants."

Agency Comments

We provided a draft of this report to the Department of Labor, the Department of the Treasury, the Internal Revenue Service, and the Social Security Administration for review and comment. While none of the agencies provided official comments, the Department of Labor and Social Security Administration provided technical comments, which we incorporated as appropriate.

As agreed with your office, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies to the Secretary of Labor, the Secretary of the Treasury, the Commissioner of the Internal Revenue Service, and the Commissioner of the Social Security Administration. In addition, the report will be available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staff have any questions about this report, please contact me at (202) 512-7215 or jeszeck@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix VIII.

Sincerely yours,



Charles A. Jeszeck
Director, Education, Workforce, and
Income Security Issues

Appendix I: Objectives, Scope, and Methodology

Overview

To determine how growing disparities in the distributions of income and wealth affect older Americans, we examined (1) the distributions of income and wealth among all older Americans over time; (2) the association between income, wealth, and longevity among older Americans; and (3) how the distributions of income and wealth have changed over time for a cohort of individuals as they aged. This appendix provides a detailed account of the data sources used to answer these questions and the analyses we conducted.

The appendix is organized into three sections. Section I describes how we reviewed literature relevant to this report's objectives and provides information on the interviews we conducted. Section II describes the information sources and methods we used to analyze the distributions of income and wealth among all older Americans over time. Section III describes the information sources and methods we used to analyze how income and wealth among older Americans are associated with longevity, and how the distributions of income and wealth changed as a cohort of individuals aged.

For the purposes of our analysis, we defined wealth to be a household's net worth—that is, total assets minus total debt. Net worth is a measure often used by researchers studying retirement security. Older Americans may have other future retirement resources, such as the present value of future income expected from defined benefit (DB) pension plans and Social Security.

Section I: Literature Review and Interviews

We supplemented our data analysis with a literature review and interviewed researchers to identify appropriate background information and context.

We had two primary methods for identifying literature to include in our literature review: a snowball technique and a database search. To apply the snowball technique, we first identified possible relevant literature by examining the studies cited in our 2016 report examining the relationship between Social Security benefits and longevity.¹ Then we reviewed the citations included in those studies. Finally, we reviewed relevant literature

¹GAO, *Retirement Security: Shorter Life Expectancy Reduces Projected Lifetime Benefits for Lower Earners*, [GAO-16-354](#) (Washington, D.C.: Mar. 25, 2016).

included in a weekly report called “Current Awareness in Aging Report,” produced by the Center for Demography of Health and Aging at the University of Wisconsin-Madison, which includes a comprehensive list of recently issued materials relating to aging, including retirement security. We compiled relevant citations across these sources and analyzed abstracts to identify working papers, journal articles, and reports that required further review. We identified reports for inclusion based on whether they provided insight into the following relationships:

- As older Americans age, the relationship between
 - income and expenses,
 - wealth and expenses, and
 - income and wealth.
- For older Americans, how income and/or wealth inequality are (1) related to the topics below and (2) how, if at all, these relationships have changed over time or generations:
 - Longevity
 - Health status
 - Gender
 - Race and ethnicity
 - Education
 - Rural vs urban locations
 - Role of inequality (income, wealth, longevity) in reliance on federal income security programs among older Americans

To complement the snowball technique search, we also conducted a database search. We searched the Proquest database EconLit for scholarly journals and working papers for a 5-year span, from 2013 through 2018, that matched keywords related to our criteria for relevance.

We took additional steps to enhance the robustness of our results. We solicited recommendations for literature from GAO stakeholders, agency officials, and contacts at the Congressional Research Service and Congressional Budget Office and added these recommendations to our list for consideration. During interviews with experts, we discussed contrary opinions and findings in the research and requested full citations as needed. We also attended retirement security events and reviewed news clippings for references to contrary opinions or findings in breaking

research. Finally, an economist reviewed the methods and reliability of all studies.

We included 26 out of 34 articles from the snowball technique search and expert recommendations and an additional 3 out of 160 articles from the database search (the database search identified some of the same articles as the snowball technique search). These 29 articles that best matched our criteria for inclusion were the articles we reviewed.

We also identified and interviewed nine researchers whose work was relevant to our objectives and interviewed them in order to identify researchers' explanations and theories about the relationships between inequality and longevity, health status, gender, education, and race and ethnicity. To select these researchers, we considered their areas of expertise; whether they worked for a federal agency, university, or other type of organization; and their ideological perspective, if known.

Section II: Analyzing Trends over Time in the Distribution of Income and Wealth among All Older Americans

Data Sources

This section describes the two main data sources we used to analyze trends in the distribution of income and wealth among all older Americans: the Survey of Consumer Finances (SCF) and the Financial Accounts of the United States (FA).

Survey of Consumer Finances

To examine the distributions of income and wealth among all older Americans over time, we used 1989 through 2016 data from the SCF. The SCF is a triennial survey of household assets and income from the Board of Governors of the Federal Reserve System (Federal Reserve) and asks households detailed questions about their income—including pension benefits—and assets—including amounts in retirement accounts. The survey also asks about debt and demographic information, among other topics. A different sample of households was used for each year in our analysis. These data allow for comparison of the experiences of same-age households at different points in time.

The SCF is conducted using a dual-frame sample design. One part of the design is a standard, multistage area-probability design, while the second part is a special over-sample of relatively wealthy households. This is done in order to accurately capture financial information about the population at large as well as characteristics specific to the relatively wealthy. The two parts of the sample are adjusted for sample nonresponse and combined using weights to make estimates from the survey data nationally representative of households overall. In addition, the SCF excludes people included in the Forbes magazine list of the 400 wealthiest people in the United States. Furthermore, the SCF omits observations that have net worth at least equal to the minimum level needed to qualify for the Forbes list. For example, the 2016 SCF surveyed 6,254 U.S. households and removed six households that had net worth equal to at least the minimum level needed to qualify for the 2016 Forbes list. Over time, the number of households interviewed has expanded (see table 2).

Table 2: Number of Respondents Included in Survey of Consumer Finances Interviews Compared to Number of Respondents in Public Dataset

Survey year	Number of respondents	Number of respondents removed from publicly available dataset for disclosure purposes	Number of respondents included in public dataset
2016	6,254	6	6,248
2013	6,026	11	6,015
2010	6,492	10	6,482
2007	4,421	4	4,417
2004	4,522	3	4,519
2001	4,449	7	4,442
1998	4,309	4	4,305
1995	4,299	0	4,299
1992	3,906	0	3,906
1989	3,143	0	3,143

Source: GAO analysis of Survey of Consumer Finances documentation. | GAO-19-587

We found the SCF to be reliable for the purposes of our report. While the SCF is a widely used federal data source, we conducted an assessment to ensure its reliability. Specifically, we reviewed related documentation and internal controls, spoke with agency officials, and conducted electronic testing. When we learned that particular estimates were not

reliable for our purposes, or had sample sizes too small to produce reliable estimates, we did not use them.

Nonetheless, the SCF and other surveys that are based on self-reported data are subject to nonsampling error, including the ability to get information about all sample cases; difficulties of definition; differences in the interpretation of questions; and errors made in collecting, recording, coding, and processing data. These nonsampling errors can influence the accuracy of information presented in the report, although the magnitude of their effect is not known.

Estimates from the SCF are also subject to some sampling error since, for any given year, the sample is one of a large number of random samples that might have been drawn. Since each possible sample could have provided different estimates, we express our confidence in the precision of the sample results as 95 percent confidence intervals. These intervals would contain the actual population values for 95 percent of the samples that could have been drawn. In this report, we present 95 percent confidence intervals alongside the numerical estimates that were produced using SCF data. All financial figures using the SCF data are in 2016 dollars.

Financial Accounts of the United States

We supplemented the SCF data with data from the Financial Accounts of the United States (FA). The FA include data on transactions and levels of financial assets, and liabilities, by sector and financial instrument; balance sheets, including changes in net worth, for households and nonprofit organizations, nonfinancial corporate businesses, and nonfinancial noncorporate businesses; Integrated Macroeconomic Accounts; and additional supplemental detail. These data provide an aggregate estimate of DB pension entitlements (or liabilities, as the FA refer to them), which can be apportioned across SCF respondents (see detailed explanation below).

Cross-Sectional Analysis

This section describes the analysis that we conducted using the SCF and FA to analyze trends in income and wealth over time for all older Americans.

Key Definitions and Assumptions

We chose to look at household-level resources because couples may pool their economic resources and the SCF asks some of its questions about resources for households. The Federal Reserve provides the underlying programming code for creating the variables presented in its publications. Where possible, we relied on variable definitions used for

Federal Reserve publications using the SCF. For example, we used the race or ethnicity of the household head, defined as either 1) white, non-Hispanic or 2) non-white or Hispanic (which we renamed “minority” for ease of reporting).² We also relied on the Federal Reserve’s definitions for

- net worth, which we refer to as “wealth” in this report;
- retirement account balances (DC plans and IRAs);
- income from withdrawals from retirement accounts; and
- income from Social Security, pension, or disability benefits or annuities.

In other cases, we developed our own variables, based on the raw variables described in the SCF codebooks. For example:

- Older households: households in which the survey respondent or any spouse or partner were aged 55 or older.³
- Household income: estimated total income by adding up all of the individual income components created by the Federal Reserve.
- Other assets: any other assets that are not retirement accounts, the present value of future income from Social Security or DB pensions, or the value of the household’s primary residence (if one is owned) or vehicles.
- Other income: any other income coming from a source besides wages; withdrawals from retirement accounts; and Social Security, pension, or disability benefits or annuities.

Analysis Goals

The SCF is a cross-sectional survey, meaning it presents a nationally representative “snapshot” for each survey wave rather than following the same households over time. To create an income distribution, we rank ordered older households by household income and then broke them into five even groups, or quintiles. The “top” refers to the top 20 percent of households in this ranking while the “bottom” refers to the bottom 20 percent of households. We repeated this exercise for each year of the data. While the households included in the SCF are different every survey

²Non-white or Hispanic would include those respondents who responded to being black/African-American non-Hispanic, Hispanic or Latino, or Other or Multiple Race.

³For purposes of data organization, the Federal Reserve considers the household head to be the male within a mixed-sex couple and the older individual within a single-sex couple.

year, we were able to examine how the distribution of income and wealth across older households changed over time. We used the same method to create wealth distributions, except we rank ordered households by net worth, one measure of wealth, instead of income.

To better understand increases in the top quintile, we also estimated the amount of income and wealth held among the top 10 percent, 5 percent, and 1 percent of households, when possible, for each survey year.⁴ We also created distributions of income and wealth for other subcategories of older households. As with the analysis for all older households, we broke the subcategory population into quintiles. We estimated distributions of income and wealth for the following subcategories for each survey year:

- Households in which the head was white and non-Hispanic
- Households in which the head was a minority
- Coupled households
- Single men
- Single women
- Households in which the head attended at least some college
- Households in which the head did not attend college

For all older households, we also estimated the percentage of households in each survey year that had 1) wage income, 2) income from retirement account withdrawals or 3) income from Social Security, pension, or disability benefits or annuities, as well as the amount of income provided by each source. Similarly, we estimated the percentage of older households that had a retirement account (DC or IRA), owned their home, or owned a vehicle, as well as the value of each of these assets. To better understand the importance of these asset types across the wealth distribution, we also estimated the percentage of households that had a retirement account (DC or IRA) with a balance of at least a \$100; owned a vehicle worth at least \$100; or had home equity of at least \$100. We also analyzed the percentage of households with retirement account balances by bands of \$50,000.

⁴Our early analyses examined the distribution of income and wealth by deciles—that is, we created 10 equally sized groups, with the first containing the first 10 percent of the distribution, the second containing the next 10 percent of the distribution and so on. However, there were insufficient data to produce all of the estimates required for our analysis.

Additional sensitivity analysis included comparing a household's location in the income distribution to its location in the wealth distribution for each survey year. We found that the vast majority of households were in the same quintile of the income and wealth distributions or were only one quintile apart. Very few households were in the bottom quintile for income and top quintile for wealth or vice-versa. From 1989 through 2016, the percentage of households who fit these two scenarios was always under 1 percent.

Estimating the Present Value of Social Security and Defined Benefit Pension Benefits

The literature on retirement adequacy emphasizes the importance of including measures of the value of future DB and Social Security benefits in measures of the wealth distribution. However, the SCF does not provide estimates of the present value of expected future DB and Social Security benefits. As a result, we did a separate analysis to estimate the present value of future income from DB and Social Security benefits using the SCF and FA data from the Federal Reserve, as well as life expectancy data from the Social Security Administration (SSA). In general, our analysis was done for respondents and spouses/partners separately at the individual level, and estimates were combined to create household totals. We generally followed methods presented in an 2016 paper entitled "Is the U.S. Retirement System Contributing to Rising Wealth Inequality?" by Devlin-Foltz, Henriques, and Sabelhaus (see bibliography for the full citation), but made some changes in the assumptions given our specific focus on older Americans.⁵

In order to estimate the present value of income expected from DB plans at the household-level, we started with the aggregate value of accrued DB benefits by survey year from the FA. Following Devlin-Foltz et al. (2016), we calculated aggregate DB pension entitlements as the portion of total pension entitlements not found in DC assets and annuities held in IRAs at life insurance companies. Then, we allocated aggregate DB entitlements across households in a series of steps, ultimately splitting the aggregate DB entitlements between SCF respondents who were already receiving benefits and those who were covered by DB plans but were not yet receiving benefits.

In the first step of the allocation, we estimated the present value of promised DB benefits for current DB beneficiaries. The present value of

⁵The authors continue to refine their methodology and we relied on recently available papers as a starting point for our analysis.

promised DB benefits for those already receiving benefits was based on the reported values for DB benefits in the SCF, life tables from SSA, and an assumed 3 percent real discount rate. After solving for the present value of promised DB benefits for those currently receiving benefits, we subtracted the total amount of DB benefits promised to current DB beneficiaries from the aggregate DB assets to solve for the share to be distributed to future DB beneficiaries. By doing this, we effectively assumed that current DB beneficiaries had first claim to DB pension assets. We allocated the remaining DB assets to future DB recipients by assigning each future DB beneficiary a share of the amount of the residual of aggregate DB entitlements (left over after current beneficiaries claimed their share) based on their earnings, the number of years they participated in a DB plan, their expected retirement age as stated in the SCF, and a 3 percent real discount rate.

We also estimated the present value of expected future Social Security benefits for current and future Social Security beneficiaries, using information from the SCF on Social Security benefits for current Social Security beneficiaries and earnings information for future Social Security beneficiaries.

With respect to current Social Security beneficiaries, we solved for the present value of Social Security benefits using annual Social Security benefits as reported in the SCF, life tables from SSA, and an assumed 3 percent real discount rate, consistent with our DB analysis. For future Social Security beneficiaries, we used current earnings or earnings from the longest job held as reported in the SCF as the basis for the Social Security benefit. Given that our analysis focused on older Americans, we assumed that future Social Security beneficiaries were close enough to retirement that the earnings information in the SCF provided a reasonable proxy for lifetime earnings. We created a monthly average of these earnings, which we used as a simplified version of the average indexed monthly earnings (AIME). We used these thresholds to compute something similar to the primary insurance amount (PIA) by assigning 90 percent of earnings up to the first bend point, 32 percent of earnings between the first and second bend points, and 15 percent of earnings between the second bend point and the monthly taxable maximum.⁶ We assumed everyone who was not yet receiving benefits but would in the future started collecting benefits at 62 or at their current age if older than

⁶These thresholds match the “bend points” used by the Social Security program.

62. We applied benefit rules associated with each individual's birth year to the PIA as set by the Social Security Administration and made adjustments for spousal benefits. We estimated the present value of Social Security benefits for future beneficiaries using the estimated PIA, a retirement age of 62 or their current age if older than 62 and not yet receiving benefits, life tables from SSA, and a 3 percent real discount rate.

While adding these present value estimates to wealth better captures the totality of resources available to older Americans, our estimates of the present value of income from future DB and Social Security benefits are subject to uncertainty and should be interpreted with caution. For example, our estimates of the present value of DB benefits for future beneficiaries are not based on SCF respondent-reported expected DB benefits. Instead, we used the aggregate DB entitlements in the FA data and allocated that amount across households with DB plans. We followed this method, in part, because it appears that workers do not have a good understanding of their pension plan parameters and confuse DB benefits with other types of payouts in the SCF data, according to Devlin-Foltz et al. (2016).

Moreover, our estimates of the present value of Social Security benefits for future beneficiaries are not based on lifetime earnings since the SCF does not collect all of the inputs needed to project Social Security benefits for respondent-families. However, it is possible to get a sense of the distributional impact of Social Security by focusing on those near retirement in certain points in time.

A general limitation of our analysis of the present value of future income from DB pensions and Social Security is that our estimates rely on assumptions about life expectancy, real discount rates, and retirement ages, which are unlikely to hold for all households. As a result, we conducted some sensitivity analyses, particularly with respect to real discount rates and retirement ages.

For both the DB and Social Security sensitivity analyses, we varied the real discount rate given the uncertainty about future interest rates. In general, higher discount rates result in lower estimated present values, so our estimates of the present value of future DB and Social Security benefits are sensitive to the assumptions about the discount rate. This is especially important in the DB analysis, as changing the assumed discount rate affects the allocation of aggregate DB assets between current and future DB beneficiaries. For example, using a 2 percent real

discount rate, as opposed to a 3 percent real discount rate, yielded a higher allocation of aggregate DB assets for current beneficiaries compared to our baseline estimates. Using a 4 percent real discount rate, as opposed to 3 percent, generated a higher allocation of aggregate DB assets for future DB beneficiaries relative to our baseline estimates.

For future beneficiaries, we had to make assumptions regarding the respondent and spouse/partner's retirement age. For the DB analysis, we used the SCF-reported expected retirement age, given that our focus is older Americans, and older people not yet claiming benefits are relatively close to retirement. Given these assumptions, we also did the analysis assuming that all future DB beneficiaries retired at 62 and 65. Assuming different retirement ages can change the amount of the share of aggregate DB assets allocated to individual future DB beneficiaries in the SCF. For the Social Security analysis, we generally assumed that future Social Security beneficiaries retired at 62, in part because a sizeable proportion of people claim Social Security at 62, despite increases in the full retirement age. In addition, according to Devlin-Foltz et al. (2016), assuming a low retirement age decreases the present value of benefits directly if the reductions for early retirement are not actuarially fair, and indirectly if the individual were to keep working at a high enough income to increase their average indexed monthly earnings. Agency officials raised technical concerns about choosing age 62. It is possible that setting the retirement age at 62 may overstate the present value of future Social Security benefits, depending on various factors including interest rates and mortality. We considered using alternative retirement ages and do not believe that choosing a different retirement age for those not yet retired would substantively change our findings.

Alternative methods to using present value estimates of future income expected from Social Security and DB pensions for analyzing distributional disparities in retirement security exist. For example, one option would be to evaluate how future monthly income from Social Security and DB pensions would be expected to affect retirement security, perhaps by assessing how the standard of living for workers would be expected to change. Additionally, disparities in health in adulthood could contribute to subsequent disparities in income and wealth at older ages. However, for our analysis, it was useful to estimate the present value of Social Security and DB pensions so we could compare the value of these sources to retirement account balances. In addition, the SCF does not include sufficient data on health to consider its role in income and wealth disparities for this part of our analysis.

Section III: Analyzing Income and Wealth: How it Changes as Older Americans Age and Associations with Longevity

This section describes the analysis we conducted to determine how the income and wealth of a specific cohort of older Americans were associated with longevity, and how the distributions of income and wealth changed as this cohort aged. For these analyses, we used data from the Health and Retirement Study (HRS), described below.

Health and Retirement Study

We analyzed data collected through the HRS, a nationally representative survey of older Americans. The HRS is a longitudinal survey, meaning that it follows the same individuals and households over the course of the study, allowing us determine how households' income and wealth changed over time. HRS is a project of the University of Michigan's Institute for Social Research that is funded through a cooperative agreement with the National Institute on Aging (U01AG009740). It collects information on individuals over age 50 and, among other things, contains detailed data on their education, marital status, work history, health, assets, and income.

Data Availability

When the HRS began in 1992, it consisted of a representative sample of Americans then aged 51-61, which is called the original or core HRS cohort. Since then, several additional cohorts of individuals have been added to the data to maintain representation of the older population, beginning in 1993 with the Asset and Health Dynamics Among the Oldest Old (AHEAD) cohort. Currently, a new cohort of participants aged 51-56 is added to the study every 6 years (see table 3). Respondents are surveyed every 2 years. We analyzed the HRS original cohort for our examinations of the association between longevity, income, wealth, and other factors; and our analysis of how income and assets change as the original HRS cohort aged. We also analyzed how income and assets changed for the War Babies cohort, which includes individuals born from 1942 through 1947. Figures from this analysis are presented in Appendix VI.

Table 3: Health and Retirement Study (HRS) Cohorts

Official HRS cohort	Year entered HRS	Age range of respondents upon survey entry	Cohort we used to analyze how income and assets change as a cohort of older Americans aged	Cohort we used to examine association between longevity, income, wealth and other factors
Asset and Health Dynamics Among the Oldest Old	1993	70 and older		
Children of the Depression	1998	68 to 74		
Health and Retirement Study – Original Cohort	1992	51 to 61	✓	✓
War Babies	1998	51 to 56	✓	
Early Baby Boomers	2004	51 to 56		
Mid Baby Boomers	2010	51 to 56		
Late Baby Boomers	2016	51 to 56		

Source: GAO analysis and HRS documentation. | GAO-19-587

We used three forms of HRS data:

- **Public-Use HRS data:** Most HRS datasets are available for download from the HRS website. For each wave, HRS makes an early release version of the data available prior to the final version. As of June 2019, final release files are available for each wave of the survey from 1992 through 2014, and the 2016 early release file is available.
- **RAND HRS data:** Researchers at RAND have created a more user-friendly version of the public-use HRS data (see below for more details). As of June 2019, RAND files are available through the 2014 final release data.
- **Restricted-use HRS data:** Some data resources in the HRS are restricted, meaning they are available only under special agreement because they contain sensitive and/or confidential information. For this report, we used restricted data containing earnings records from SSA. We conducted our analysis of the restricted-use files via a virtual desktop environment data enclave made available by the University of Michigan’s Center on the Demography of Aging (MiCDA).

Data Processing

RAND, a research organization, cleans and processes the HRS data to create a user-friendly longitudinal dataset that has consistent and intuitive naming conventions and model-based imputations for missing wealth and income data. In most cases, we used the RAND version of the HRS variables due to the greater ease of use and the additional data cleaning already performed. RAND income and wealth variables were given in

nominal dollars. We adjusted these variables to real 2016 dollars using the Consumer Price Index for All Urban Consumers. To calculate mortality, we supplemented the RAND files with information from the early release 2016 public use file to the extent that it provided additional information on mortality through 2014. See the data reliability section below for further discussion of the mortality data.

Data Reliability

We found the HRS variables presented in this report to be sufficiently reliable. We conducted a data reliability assessment of selected variables by conducting electronic data tests, reviewing documentation on the dataset, and reviewing related internal controls. When we learned that particular variables were not sufficiently reliable, we did not use them in our analysis. We selected our analyses to ensure there was sufficient sample size to produce reliable estimates. We produced variance estimates using a statistical technique chosen to account for the sample design of the HRS and adjusted the sample weights to account for potential bias due to the linkage to SSA administrative data, as described below. We identified additional limitations due to the survey responses being self-reported. As such, they are subject to the respondent's possible errors in reporting specific financial amounts.

We measured mortality from 1992 through 2014. Mortality data in the HRS, including an indicator for a respondent's death in a given survey year and month and year of death, come from matches with the National Death Index or follow-up interviews with surviving family members. There is complete date of death (specifically month and year of death) information for nearly everyone who died prior to 2012. However, for deaths since 2012, the HRS data linked to the National Death Index was not available, which likely lead to more deaths without information on month and year of death. Since the 2012 and 2014 survey years, there has been time to gather death date information from follow up interviews with families, and less than 10 percent of those who died between the 2012 and 2014 survey years had incomplete data on month and year of death. However, in the 2016 survey year early release public use file, we found that a higher proportion of those who died did not have death dates, likely due to the lack of linkage with the National Death Index and a lack of time to follow up with families since the 2016 survey year to find out when survey participants died. As a result, we determined that we had reliable data on mortality through 2014.

Weight Adjustments

HRS contains restricted data drawn from SSA administrative sources for participants who have provided explicit consent to link their responses to administrative data and subsequently were successfully linked with the

administrative data. It is possible that respondents who were linked may differ in systematic ways from respondents who were not linked, which would affect the generalizability of estimates derived solely from the subset of participants who were linked. The survey weights provided with HRS data account for the complexity of the survey design (e.g., oversamples of minorities and Floridians), nonresponse, and post-stratification adjustments for demographic distributions, but do not adjust for the administrative linkage. There is evidence that in at least some waves of the survey, there are modest but statistically significant differences in linkage rates on characteristics including race, income, and wealth.

One technique to address this potential source of bias is to adjust the sample weights used in variance estimation for observed differences between those with and without linked administrative data. Kapteyn et al. suggest a technique for computing inverse probability weights to account for these differences.⁷ Following this technique, HRS has computed a set of weights that account for consent to SSA administrative linkage, but only for the 1992, 1998, and 2004 survey waves. However, this report needed adjusted household weights for all 12 waves and adjusted respondent weights for wave 1. We opted to address the potential non-linkage bias using a logistic model-based propensity score adjustment, rather than a weighting class adjustment for several reasons. First, we had the benefit of many variables with which to model the propensity of non-linkage. Second, weighting class adjustments, which involve creating mutually exclusive classes based on the variables associated with non-linkage, were not feasible because of the large number of variables we included in the adjustment. The number of respondents per cell would be too small. Third, the propensity score adjustment allows us to consider many variables at the same time. Finally, the propensity score adjustment allows us to rank respondents, rather than assume that the characteristics used in a weighting class adjustment would perfectly predict non-linkage.

We compared estimates and standard errors obtained using the original weights to the non-linkage adjusted weights. The adjusted weights changed estimates and their standard errors in generally small amounts, but did not affect observed trends in this report. For instance, the median absolute value of the change was less than 1 percent for estimates of

⁷Arie Kapteyn et al., "Effects of Attrition and Non-Response in the Health and Retirement Study," *IZA Discussion Paper Series* No. 2246 (August 2006).

median household income for individuals by mid-career earnings quintiles from 1992 to 2014. The median absolute value of the change was 5.7 percent for the standard errors of those estimates.

Variance Estimation

We used the balanced repeated replication method to estimate standard errors for the income and wealth statistics we reported using HRS because the income and wealth statistics were quantiles (i.e., medians). The standard Taylor series (Woodruff) variance estimation method assumes that quantiles can be expressed as a smooth function in the sample and population. However, quantile functions are not considered smooth. After ruling out Taylor series method, we explored replication methods such as jackknife, bootstrap, and balanced repeated replication. Of those, the balanced repeated replication is most suited for the two primary sampling units per stratum design of the HRS. The Fay adjustment stabilizes the estimates across strata when using the normal balanced repeated replication method. This adjustment is particularly relevant for smaller samples. The literature we reviewed suggested that the jackknife produces a poor estimate of the variance of quantiles (Lohr 2009 and Judkins 1990) and that the bootstrap requires more computations than balanced repeated replication.⁸

Mid-Career Household Earnings Measure Construction

For our analyses, we wanted to classify HRS respondents into income groupings based on a relatively stable measure of income that uses multiple years of administrative data, to reduce measurement error in self-reported survey data and to reduce the chance of basing the income grouping on a single year of unusually low or high income. Several limitations prevent us from classifying households based on their full lifetime income from all sources. HRS does not contain administrative data on income sources besides earnings and Social Security benefits. Moreover, for years before 1978, the administrative earnings records are only available for earnings covered by Social Security and below the taxable maximum. Finally, not all sources of earnings are covered by Social Security. While around 96 percent of employment is currently covered by Social Security, this has not always been the case. In particular, successive expansions of coverage in the 1950s and 1960s greatly increased the proportion of the workforce covered by Social Security, such that relying on SSA earnings records going back to 1951

⁸Lohr, Sharon L. 2009. *Sampling: Design and Analysis*. 2nd ed. New York: Brooks/Cole and Judkins, David R. "Fay's method for variance estimation." *Journal of Official Statistics*, vol. 6, no. 3 (1990): 223-239.

would underestimate the earnings of large numbers of older HRS participants.

Thus, for our analysis, we constructed earnings groupings based on a measure of “mid-career” earnings, based on a household’s average annual reported earnings when the household head was age 41 to age 50. Earnings tend to peak (and remain relatively stable) for workers in their mid-40s through their early 50s. We begin measuring earnings at age 41 to avoid using data prior to expansions of Social Security coverage and to minimize our reliance on imputed earnings above the taxable maximum. In the early years of the study, HRS sought retrospective consent for administrative data linkages. As a result, some participants who only provided consent for the administrative linkage during their initial interview and did not provide consent in subsequent interviews did not have earnings records after age 50. Therefore, we set age 50 as the upper bound for our measure of mid-career earnings.

Analyzing the Association Among Income, Wealth, Longevity, and Other Variables

Analysis Goals

Our goal was to determine how income, wealth, and other demographic and health-related factors are associated with the longevity of older Americans over age 50 in the original HRS cohort. We measured the proportion of original HRS participants still alive at the end of the survey to examine how longevity varied across the income and wealth distributions, as well as across different demographic and health-related variables, including race, educational attainment, gender, and self-reported health status at the beginning of the survey.

Survival Analysis

Overview

In order to examine these relationships, we used data from the original HRS cohort to measure deaths over a maximum of 22 years (1992 through 2014). Every 2 years, the HRS attempted to measure whether the original respondents were still alive, but these longevity data were incomplete because some of the original respondents declined to

participate in later waves of the survey. Once these respondents left the survey, their actual longevity could not be followed.⁹

This incomplete measurement of longevity is generally known as “censored data” in statistics.¹⁰ Special methods of “survival analysis” are required to avoid making inaccurate conclusions about actual longevity from this type of data, when the analyst can only measure longevity up to a certain time before death.¹¹ Survival analysis accounts for survey respondents with complete or incomplete longevity data. Without making this distinction, ordinary statistical methods, such as linear regression models of the observed longevities, would not include the correct sample of respondents when estimating the chance that a respondent would die at any time within the observation period. In addition, ordinary methods would incorrectly treat the longevities observed in the observation period as actual longevities, when some of them are the shorter, censored longevities observed before the respondents dropped out of the study. Survival analysis methods correct for this problem, in order to reliably estimate the chance of death by any given time in the observation period.¹²

⁹Some of the original respondents continued participating in the survey through 2014, the final year used in our analysis, but had not yet died at the end of the observation period. The HRS could not measure the actual longevity of this second subgroup, because their deaths had not yet occurred. This form of censored data did not affect our analysis, because we do not make inferences about longevity after 2014. Moreover, the end of the observation period was fixed by the release schedule of the HRS public use data files, which should not be systematically related to mortality.

¹⁰J.D. Kalbfleisch and R.L. Prentice, *The Statistical Analysis of Failure Time Data*. New York: John Wiley and Sons, 1980. 39.

¹¹*Ibid*, 39-41.

¹²For example, consider a study observes a group of 100 people in 1990, 2000, and 2010. Between 1990 and 2000, 15 people in the group die, and 20 drop out of the study. The likelihood that someone observed in 1990 is still alive in 2000 is 85/100, or 85 percent. Between 2000 and 2010, 10 more people die, and 5 leave the study. There are 65 people still in the study in 2000, so the likelihood that someone observed in 2000 is still alive in 2010 is 55/65, or 84.6 percent. Using only information on the number of people in the group in 1990 who did not die, a simple estimate of the fraction of people who survived until 2010 is $(100 - 15 - 10)/100$, or 75 percent. However, this estimate does not account for the people who left the study. Using survival analysis to account for people who left the study, the likelihood that someone observed in 1990 is still alive in 2010 is equal to the likelihood that someone lived from 1990 to 2000 and also lived from 2000 to 2010: $(85/100) \times (55/65)$, or 71.9 percent. Not accounting for people who leave the study may lead to biased estimates of survival rates.

Most importantly, our analysis assumed actual longevity during the observation period did not have a systematic relationship with whether the original HRS respondents continued to participate in the study except that leaving the study implied a later death (“noninformative censoring”). In other words, participants with censored and actual longevity did not systematically differ in ways that affected longevity or the variables associated with it. We believe this assumption to be reasonable for the purpose of our analysis for two reasons. First, a small percentage (8 percent) of the original respondents dropped out of the survey, so that the impact of any longevity differences among the population who dropped out would likely have been small. Second, while some baseline characteristics of respondents do appear correlated with non-response over time, the population that dropped out of the study does not appear to vary significantly from those completing each wave, except for race and ethnicity.¹³

Detailed Methods

In our survival analysis, the dependent variable was composed of two parts, including the time in months to death and whether death was observed during the survey period. In general, we used continuous time survival models, including Kaplan-Meier and Cox proportional hazards regression models to estimate survival functions, which estimate the probability of surviving (or dying) up to the end of the survey period, and hazard functions, which estimate the probability of death, per time unit, given that an individual has survived up to that point in time.

We used the Kaplan-Meier method to estimate survival probabilities as a function of time and to obtain univariate statistics on survival for different groups. For example, we estimated the percentage of survivors during the survey period across income and wealth quintiles. We also estimated survivorship across the demographic and health-related variables.

Moreover, using the Cox proportional hazards regression models, we analyzed the relationship between income and longevity and wealth and longevity, controlling for related demographic and health-related variables, as well as age at the beginning of the survey. These regressions allow the relationships between various characteristics and

¹³Arie Kapteyn, Pierre-Carl Michaud, James Smith, and Arthur van Soest, “Effects of Attrition and Non-Response in the Health and Retirement Study,” IZA Discussion Paper No. 2246 (2006).

death to be described as hazard ratios. For example, hazard ratios that are statistically significant and greater than 1.00 indicate that individuals with those characteristics are more likely to die during the survey period compared to a reference group. Hazard ratios that are statistically significant and less than 1.00 indicate that individuals with those characteristics are less likely to die in the study period compared to a reference group.

We estimated survivorship among individuals with the following characteristics in combination: bottom income (earnings) quintile and no college; middle of the income (earnings) distribution (third quintile) and high school diploma or some college (excluding GED); and top of the income (earnings) distribution and college diploma. We then ran a subset of these scenarios using different combinations of self-reported health status for each of the three main scenarios. For example, we estimated survivorship among individuals in the bottom income (earnings) quintile, who had not attended college, and reported being in fair or poor health in 1992.

Our results have limitations and should be interpreted with caution. Results from the survival analysis present correlations, not causal estimates. Moreover, while our main analysis includes self-reported health status at the beginning of the study period, we also excluded this variable as a sensitivity check given the interconnectedness of income, wealth, and health and the conclusions were similar. Furthermore, due to limitations with respect to the mortality data in later years of the HRS, we did not have specific months and years of death for 60 respondents we know died during the observation period due to death indicators in the interview status variables from HRS. As a result, we imputed their death dates based on the survey year they were indicated to have died in from the HRS interview status questions. While death is continuous in the sense that it can happen to any person at any time, we only observe death within a given month for those with death dates in the data, and only within a year for those whose death information we gathered for the interview status variables. As a sensitivity check, we redid the analysis using survival information at the person-year level and discrete survival analysis techniques and found similar results.

Analyzing How Income and Wealth Change as Older Americans Aged

This section describes how we used the HRS to determine how the distributions of income and wealth change as older Americans in the original HRS cohort aged.

Key Definitions and Assumptions

We focused this analysis on the original HRS cohort (born 1931-1941). This cohort entered the study in 1992 at ages 51-61 and had reached their 70s or early 80s by 2014, allowing us to analyze how income and assets changed as these households progressed through retirement.

We conducted our analysis and reported results at the household level because couples may pool financial resources or co-own assets. Also, RAND HRS variables on income and wealth are presented at the household level. When necessary, we combined respondent and spouse or partner level variables we used from the public-use file in order to obtain household-level variables. We restricted this analysis to survey respondents (“household heads”), or any spouses or partners, who were still alive in 2014 to ensure we followed the same group of people throughout our analysis. We grouped households into five earnings groups based on their mid-career earnings, as described above.

Analysis Goals

Our primary goal was to examine how the distribution of income and wealth changed over time for households in the original HRS cohort, based on their mid-career earnings groups. We also examined how specific sources of income and wealth changed over time. We also wanted to determine how these trends varied based on household demographic characteristics, including race and ethnicity and education level, without attempting to ascribe causality. Our analysis included survey respondents (heads of households) or their spouses or partners who responded to the survey in 1992 and were still alive and responded in 2014, which is the most recent year for which the data are complete. The heads of households we analyzed were from the original HRS cohort and were born in 1931 to 1941. If neither the head of household or the spouse or partner interviewed in 1992 was still alive in 2014, their household was not included in our sample.

In order to do so, we estimated median levels of household wealth and income every 2 years for each earnings group, as well as median levels for specific sources of income and wealth. We estimated the percentage changes and absolute changes in median wealth and income for each earnings group from 1992 through 2014 in order to determine whether income or wealth levels increased or decreased over time. For specific sources of income and wealth, we estimated medians for all households in each earnings group as well as for only those households which reported having the specific source of income or wealth. For example, we determined the median home equity for all households in each earnings group as well as the median home equity for only those households with home equity for each earnings group. Finally, we calculated the percent

of our sample having each type of wealth and income (e.g. home equity, Social Security benefits) for each year in the data. As a sensitivity check, we also analyzed how total assets and income changed for the HRS's "War Babies" cohort (born 1942-1947). For this analysis, we report 99 percent confidence intervals alongside the percentage or other numerical estimates. We chose to use this level of confidence to account for the use of imputation in the RAND HRS data in addition to the sampling error that using survey data introduces. All financial figures using the HRS data are in 2016 dollars.

Appendix II: Financial and Demographic Characteristics across the Wealth Distribution

This appendix compares the top 1 percent of the wealth distribution of older households to several other groups in this distribution: (1) the next 19 percent, (2) the top 20 percent, (3) the bottom 80 percent, and (4) the bottom 20 percent. These comparisons provide context for the financial security of the top 1 percent relative to other households at the top of the wealth distribution, the remainder of the wealth distribution, and households at the bottom of the distribution, respectively.

To draw these comparisons, we used 2016 data from the Survey of Consumer Finances, a triennial, cross-sectional survey produced by the Board of Governors of the Federal Reserve System. A different sample of households was used for each year in our analysis. These data allow for comparison of the experiences of same-age households at different points in time. We chose to look at household-level resources because couples may pool their economic resources, and the SCF asks some of its questions about resources for households. We conducted our analysis for older households, which were defined as those in which the household head or any spouse or partner were ages 55 or older. We defined wealth as net worth, or assets minus debt. Because the sample size for the top 1 percent is small, we presented dollar values rounded to thousands of 2016 dollars.

Top 1 Percent of Households by Wealth, Age 55 or Older in 2016

Financial and Demographic Characteristics

Demographic Characteristics

By age:

- 49 percent were age 55 to 64
- 28 percent were age 65 to 74
- 22 percent were age 75 or older

By race and ethnicity of household head:

- 94 percent were white, non-Hispanic
- 6 percent were a minority

By household type:

- 91 percent were coupled households
- 6 percent were single men
- 3 percent were single women

By education level of household head:

- 96 percent had at least some college education
- 4 percent did not attend college

Source: GAO analysis of 2016 Survey of Consumer Finances data. | GAO-19-587

Notes: Categories may not sum to 100 percent due to rounding. Age percentages had 95 percent confidence intervals within +/- 10 percentage points. Race and ethnicity percentages had 95 percent confidence intervals within +/- 6 percentage points. Household type percentages had 95 percent confidence intervals within +/- 7 percentage points. Education level percentages had 95 percent confidence intervals within +/- 2 percentage points.

Percentage of Households with Selected Financial Assets and Liabilities

Financial resource	Estimated percentage of households	95 percent confidence interval lower bound	95 percent confidence interval upper bound
Retirement account(s)	92.6	88.7	96.5
Home	97.3	94.6	99.9
Vehicle(s)	91.0	84.3	97.6
All other assets	100.0	100.0	100.0
Debt	53.6	42.7	64.4

Source: GAO analysis of 2016 Survey of Consumer Finances data. | GAO-19-587

Notes: We ranked these households by their net worth to identify which households fell into the top 1 percent. "Retirement account(s)" refers to defined contribution accounts or IRAs. "Home" refers to the household's primary residence, if the household member(s) own it. "Debt" refers to mortgages, loans, lines of credit, and credit card balances after the last payment.

Average Value of Selected Financial Assets and Liabilities

Financial resource	Estimated average (mean) value (2016 dollars)	95 percent confidence interval lower bound	95 percent confidence interval upper bound
Retirement account(s)	1,701,000	1,271,000	2,132,000
Home	2,124,000	1,740,000	2,509,000
Vehicle(s)	182,000	118,000	246,000
All other assets	33,368,000	28,892,000	37,845,000
Debt	635,000	415,000	855,000

Source: GAO analysis of 2016 Survey of Consumer Finances data. | GAO-19-587

Notes: We ranked these households by their net worth to identify which households fell into the top 1 percent. "Retirement account(s)" refers to defined contribution accounts or IRAs. "Home" refers to the household's primary residence, if the household member(s) own it. "Debt" refers to mortgages, loans, lines of credit, and credit card balances after the last payment.

Median Value of Selected Financial Assets and Liabilities

Financial resource	Estimated median value (2016 dollars)	95 percent confidence interval lower bound	95 percent confidence interval upper bound
Retirement account(s)	1,079,000	667,000	1,491,000
Home	1,320,000	888,000	1,752,000
Vehicle(s)	61,000	38,000	83,000
All other assets	19,083,000	14,424,000	23,743,000
Debt	n/a	n/a	n/a

Source: GAO analysis of 2016 Survey of Consumer Finances data. | GAO-19-587

n/a Not available. There were insufficient data to produce a reliable estimate of median debt.

Notes: We ranked these households by their net worth to identify which households fell into the top 1 percent. "Retirement account(s)" refers to defined contribution accounts or IRAs. "Home" refers to the household's primary residence, if the household member(s) own it. "Debt" refers to mortgages, loans, lines of credit, and credit card balances after the last payment.

Next 19 Percent of Households by Wealth, Age 55 or Older in 2016

Financial and Demographic Characteristics

Demographic Characteristics

By age:

41 percent were age 55 to 64

34 percent were age 65 to 74

26 percent were age 75 or older

By race and ethnicity of household head:

90 percent were white, non-Hispanic

10 percent were a minority

By household type:

78 percent were coupled households

10 percent were single men

12 percent were single women

By education level of household head:

88 percent had at least some college education

12 percent did not attend college

Source: GAO analysis of 2016 Survey of Consumer Finances data. | GAO-19-587

Notes: Categories may not sum to 100 percent due to rounding. Age percentages had 95 percent confidence intervals within +/- 4 percentage points. Race and ethnicity percentages had 95 percent confidence intervals within +/- 3 percentage points. Household type percentages had 95 percent confidence intervals within +/- 4 percentage points. Education level percentages had 95 percent confidence intervals within +/- 3 percentage points.

Percentage of Households with Selected Financial Assets and Liabilities

Financial resource	Estimated percentage of households	95 percent confidence interval lower bound	95 percent confidence interval upper bound
Retirement account(s)	85.5	83.0	88.1
Home	95.4	93.5	97.2
Vehicle(s)	95.1	93.6	96.7
All other assets	100.0	100.0	100.0
Debt	64.8	61.3	68.3

Source: GAO analysis of 2016 Survey of Consumer Finances data. | GAO-19-587

Notes: We ranked these households by their net worth to identify which households fell into the top 20 percent, excluding the top 1 percent (i.e., the 81st through 99th percentiles of the wealth distribution). "Retirement account(s)" refers to defined contribution accounts or IRAs. "Home" refers to the household's primary residence, if the household member(s) own it. "Debt" refers to mortgages, loans, lines of credit, and credit card balances after the last payment.

Average Value of Selected Financial Assets and Liabilities

Financial resource	Estimated average (mean) value (2016 dollars)	95 percent confidence interval lower bound	95 percent confidence interval upper bound
Retirement account(s)	687,000	634,000	741,000
Home	589,000	554,000	623,000
Vehicle(s)	41,000	38,000	44,000
All other assets	1,754,000	1,642,000	1,867,000
Debt	151,000	132,000	170,000

Source: GAO analysis of 2016 Survey of Consumer Finances data. | GAO-19-587

Notes: We ranked these households by their net worth to identify which households fell into the top 20 percent, excluding the top 1 percent (i.e., the 81st through 99th percentiles of the wealth distribution). "Retirement account(s)" refers to defined contribution accounts or IRAs. "Home" refers to the household's primary residence, if the household member(s) own it. "Debt" refers to mortgages, loans, lines of credit, and credit card balances after the last payment.

Median Value of Selected Financial Assets and Liabilities

Financial resource	Estimated median value (2016 dollars)	95 percent confidence interval lower bound	95 percent confidence interval upper bound
Retirement account(s)	486,000	415,000	556,000
Home	463,000	420,000	506,000
Vehicle(s)	31,000	28,000	33,000
All other assets	990,000	884,000	1,096,000
Debt	n/a	n/a	n/a

Source: GAO analysis of 2016 Survey of Consumer Finances data. | GAO-19-587

n/a Not available. There were insufficient data to produce a reliable estimate of median debt.

Notes: We ranked these households by their net worth to identify which households fell into the top 20 percent, excluding the top 1 percent (i.e., the 81st through 99th percentiles of the wealth distribution). "Retirement account(s)" refers to defined contribution accounts or IRAs. "Home" refers to the household's primary residence, if the household member(s) own it. "Debt" refers to mortgages, loans, lines of credit, and credit card balances after the last payment.

Top 20 Percent of Households by Wealth, Age 55 or Older in 2016

Financial and Demographic Characteristics

Demographic Characteristics

By age:

- 41 percent were age 55 to 64
- 33 percent were age 65 to 74
- 26 percent were age 75 or older

By race and ethnicity of household head:

- 91 percent were white, non-Hispanic
- 9 percent were a minority

By household type:

- 79 percent were coupled households
- 10 percent were single men
- 11 percent were single women

By education level of household head:

- 88 percent had at least some college education
- 12 percent did not attend college

Source: GAO analysis of 2016 Survey of Consumer Finances data. | GAO-19-587

Notes: Categories may not sum to 100 percent due to rounding. Age percentages had 95 percent confidence intervals within +/- 4 percentage points. Race and ethnicity percentages had 95 percent confidence intervals within +/- 3 percentage points. Household type percentages had 95 percent confidence intervals within +/- 4 percentage points. Education level percentages had 95 percent confidence intervals within +/- 3 percentage points.

Percentage of Households with Selected Financial Assets and Liabilities

Financial resource	Estimated percentage of households	95 percent confidence interval lower bound	95 percent confidence interval upper bound
Retirement account(s)	85.9	83.5	88.3
Home	95.4	93.6	97.3
Vehicle(s)	94.9	93.4	96.4
All other assets	100.0	100.0	100.0
Debt	64.3	60.8	67.7

Source: GAO analysis of 2016 Survey of Consumer Finances data. | GAO-19-587

Notes: We ranked these households by their net worth to identify which households fell into the top 20 percent. "Retirement account(s)" refers to defined contribution accounts or IRAs. "Home" refers to the household's primary residence, if the household member(s) own it. "Debt" refers to mortgages, loans, lines of credit, and credit card balances after the last payment.

Average Value of Selected Financial Assets and Liabilities

Financial resource	Estimated average (mean) value (2016 dollars)	95 percent confidence interval lower bound	95 percent confidence interval upper bound
Retirement account(s)	738,000	682,000	794,000
Home	665,000	628,000	703,000
Vehicle(s)	48,000	44,000	52,000
All other assets	3,339,000	3,101,000	3,577,000
Debt	175,000	154,000	196,000

Source: GAO analysis of 2016 Survey of Consumer Finances data. | GAO-19-587

Notes: We ranked these households by their net worth to identify which households fell into the top 20 percent. "Retirement account(s)" refers to defined contribution accounts or IRAs. "Home" refers to the household's primary residence, if the household member(s) own it. "Debt" refers to mortgages, loans, lines of credit, and credit card balances after the last payment.

Median Value of Selected Financial Assets and Liabilities

Financial resource	Estimated median value (2016 dollars)	95 percent confidence interval lower bound	95 percent confidence interval upper bound
Retirement account(s)	495,000	434,000	556,000
Home	489,000	453,000	525,000
Vehicle(s)	32,000	29,000	34,000
All other assets	1,070,000	969,000	1,170,000
Debt	n/a	n/a	n/a

Source: GAO analysis of 2016 Survey of Consumer Finances data. | GAO-19-587

n/a Not available. There were insufficient data to produce a reliable estimate of median debt.

Notes: We ranked these households by their net worth to identify which households fell into the top 20 percent. "Retirement account(s)" refers to defined contribution accounts or IRAs. "Home" refers to the household's primary residence, if the household member(s) own it. "Debt" refers to mortgages, loans, lines of credit, and credit card balances after the last payment.

Bottom 80 Percent of Households by Wealth, Age 55 or Older in 2016

Financial and Demographic Characteristics

Demographic Characteristics

By age:

- 44 percent were age 55 to 64
- 32 percent were age 65 to 74
- 25 percent were age 75 or older

By race and ethnicity of household head:

- 70 percent were white, non-Hispanic
- 30 percent were a minority

By household type:

- 49 percent were coupled households
- 16 percent were single men
- 35 percent were single women

By education level of household head:

- 50 percent had at least some college education
- 50 percent did not attend college

Source: GAO analysis of 2016 Survey of Consumer Finances data. | GAO-19-587

Notes: Categories may not sum to 100 percent due to rounding. Age percentages had 95 percent confidence intervals within +/- 1 percentage points. Race and ethnicity percentages had 95 percent confidence intervals within +/- 2 percentage points. Household type percentages had 95 percent confidence intervals within +/- 2 percentage points. Education level percentages had 95 percent confidence intervals within +/- 2 percentage points.

Percentage of Households with Selected Financial Assets and Liabilities

Financial resource	Estimated percentage of households	95 percent confidence interval lower bound	95 percent confidence interval upper bound
Retirement account(s)	43.2	41.2	45.1
Home	73.5	72.9	74.1
Vehicle(s)	83.4	82.1	84.7
All other assets	98.2	97.6	98.7
Debt	69.8	68.5	71.1

Source: GAO analysis of 2016 Survey of Consumer Finances data. | GAO-19-587

Notes: We ranked these households by their net worth to identify which households fell into the bottom 80 percent. "Retirement account(s)" refers to defined contribution accounts or IRAs. "Home" refers to the household's primary residence, if the household member(s) own it. "Debt" refers to mortgages, loans, lines of credit, and credit card balances after the last payment.

Average Value of Selected Financial Assets and Liabilities

Financial resource	Estimated average (mean) value (2016 dollars)	95 percent confidence interval lower bound	95 percent confidence interval upper bound
Retirement account(s)	47,000	43,000	51,000
Home	136,000	130,000	141,000
Vehicle(s)	17,000	16,000	17,000
All other assets	70,000	65,000	75,000
Debt	54,000	51,000	58,000

Source: GAO analysis of 2016 Survey of Consumer Finances data. | GAO-19-587

Notes: We ranked these households by their net worth to identify which households fell into the bottom 80 percent. "Retirement account(s)" refers to defined contribution accounts or IRAs. "Home" refers to the household's primary residence, if the household member(s) own it. "Debt" refers to mortgages, loans, lines of credit, and credit card balances after the last payment.

Median Value of Selected Financial Assets and Liabilities

Financial resource	Estimated median value (2016 dollars)	95 percent confidence interval lower bound	95 percent confidence interval upper bound
Retirement account(s)	0	0	0
Home	100,000	94,000	106,000
Vehicle(s)	11,000	10,000	12,000
All other assets	12,000	10,000	13,000
Debt	10,000	8,000	11,000

Source: GAO analysis of 2016 Survey of Consumer Finances data. | GAO-19-587

Notes: We ranked these households by their net worth to identify which households fell into the bottom 80 percent. "Retirement account(s)" refers to defined contribution accounts or IRAs. "Home" refers to the household's primary residence, if the household member(s) own it. "Debt" refers to mortgages, loans, lines of credit, and credit card balances after the last payment.

Bottom 20 Percent of Households by Wealth, Age 55 or Older in 2016

Financial and Demographic Characteristics

Demographic Characteristics

By age:

- 41 percent were age 55 to 64
- 33 percent were age 65 to 74
- 26 percent were age 75 or older

By race and ethnicity of household head:

- 55 percent were white, non-Hispanic
- 45 percent were a minority

By household type:

- 17 percent were coupled households
- 24 percent were single men
- 59 percent were single women

By education level of household head:

- 32 percent had at least some college education
- 68 percent did not attend college

Source: GAO analysis of 2016 Survey of Consumer Finances data. | GAO-19-587

Notes: Categories may not sum to 100 percent due to rounding. Age percentages had 95 percent confidence intervals within +/- 4 percentage points. Race and ethnicity percentages had 95 percent confidence intervals within +/- 5 percentage points. Household type percentages had 95 percent confidence intervals within +/- 4 percentage points. Education level percentages had 95 percent confidence intervals within +/- 4 percentage points.

Percentage of Households with Selected Financial Assets and Liabilities

Financial resource	Estimated percentage of households	95 percent confidence interval lower bound	95 percent confidence interval upper bound
Retirement account(s)	11.1	9.2	13.0
Home	19.5	16.6	22.3
Vehicle(s)	62.1	58.6	65.6
All other assets	95.2	93.4	96.9
Debt	58.0	55.2	60.8

Source: GAO analysis of 2016 Survey of Consumer Finances data. | GAO-19-587

Notes: We ranked these households by their net worth to identify which households fell into the bottom 20 percent. "Retirement account(s)" refers to defined contribution accounts or IRAs. "Home" refers to the household's primary residence, if the household member(s) own it. "Debt" refers to mortgages, loans, lines of credit, and credit card balances after the last payment.

Average Value of Selected Financial Assets and Liabilities

Financial resource	Estimated average (mean) value (2016 dollars)	95 percent confidence interval lower bound	95 percent confidence interval upper bound
Retirement account(s)	1,000	1,000	2,000
Home	17,000	14,000	21,000
Vehicle(s)	7,000	6,000	7,000
All other assets	3,000	3,000	4,000
Debt	26,000	22,000	30,000

Source: GAO analysis of 2016 Survey of Consumer Finances data. | GAO-19-587

Notes: We ranked these households by their net worth to identify which households fell into the bottom 20 percent. "Retirement account(s)" refers to defined contribution accounts or IRAs. "Home" refers to the household's primary residence, if the household member(s) own it. "Debt" refers to mortgages, loans, lines of credit, and credit card balances after the last payment.

Median Value of Selected Financial Assets and Liabilities

Financial resource	Estimated median value (2016 dollars)	95 percent confidence interval lower bound	95 percent confidence interval upper bound
Retirement account(s)	0	0	0
Home	0	0	0
Vehicle(s)	4,000	3,000	4,000
All other assets	1,000	1,000	1,000
Debt	n/a	n/a	n/a

Source: GAO analysis of 2016 Survey of Consumer Finances data. | GAO-19-587

n/a Not available. There were insufficient data to produce a reliable estimate of median debt.

Notes: We ranked these households by their net worth to identify which households fell into the bottom 20 percent. "Retirement account(s)" refers to defined contribution accounts or IRAs. "Home" refers to the household's primary residence, if the household member(s) own it. "Debt" refers to mortgages, loans, lines of credit, and credit card balances after the last payment.

Appendix III: Additional Data Tables

This appendix contains several tables that show the underlying data supporting this report’s findings and figures. The following tables and information are included in this appendix:

- Table 4: Confidence Intervals for Estimates Shown in Figure 5
- Table 5: Confidence Intervals for Estimates Shown in Figure 6
- Table 6: Confidence Intervals for Estimated Percentage of Older Households with Retirement Account Balances By Amount in 2016, as Shown in Figure 10
- Table 7: Estimated Median Household Income for Individuals Born in 1931-941 and Their Spouses or Partners, as They Aged, by Mid-Career Earnings Level and Race and Ethnicity
- Table 8: Estimated Median Household Wealth for Individuals Born in 1931-1941 and Their Spouses or Partners, as They Aged, by Mid-Career Earnings Level and Race and Ethnicity
- Table 9: Estimated Median Household Income for Individuals Born in 1931-1941 and Their Spouses or Partners, as They Aged, by Mid-Career Earnings Level and Education
- Table 10: Estimated Median Household Wealth for Individuals Born in 1931-1941 and Their Spouses or Partners, as They Aged, by Mid-Career Earnings Level and Education

Table 4: Confidence Intervals for Estimates Shown in Figure 5

			Average	Lower bound 95% confidence interval	Upper bound 95% confidence interval
2016 dollars					
Bottom quintile	1989	Wealth	3,943	2,815	5,071
		Present value of future Social Security benefits	113,739	104,740	122,738
	1992	Wealth	6,293	3,990	8,596
		Present value of future Social Security benefits	144,108	131,650	156,566
	1995	Wealth	7,146	4,985	9,307
		Present value of future Social Security benefits	151,064	136,640	165,488
	1998	Wealth	10,518	8,343	12,693
		Present value of future Social Security benefits	168,365	157,676	179,054
	2001	Wealth	12,263	10,118	14,408
		Present value of future Social Security benefits	191,556	171,998	211,114
	2004	Wealth	10,678	8,756	12,600
		Present value of future Social Security benefits	182,140	161,714	202,566

Appendix III: Additional Data Tables

		Average	Lower bound 95% confidence interval	Upper bound 95% confidence interval
2007	Wealth	9,797	5,016	14,578
	Present value of future Social Security benefits	189,643	169,199	210,087
2010	Wealth	-3,940	-8,262	382
	Present value of future Social Security benefits	222,472	210,849	234,095
2013	Wealth	-7,289	-15,661	1,083
	Present value of future Social Security benefits	204,336	194,582	214,090
2016	Wealth	n/a	n/a	n/a
	Present value of future Social Security benefits	218,859	209,802	227,916
Second quintile 1989	Wealth	57,868	52,226	63,510
	Present value of future Social Security benefits	153,852	131,736	175,968
1992	Wealth	69,084	64,810	73,358
	Present value of future Social Security benefits	160,982	142,245	179,719
1995	Wealth	73,711	69,044	78,378
	Present value of future Social Security benefits	190,867	173,311	208,423
1998	Wealth	93,483	89,138	97,828
	Present value of future Social Security benefits	198,012	166,239	229,785
2001	Wealth	100,239	95,686	104,792
	Present value of future Social Security benefits	198,561	175,449	221,673
2004	Wealth	100,765	94,324	107,206
	Present value of future Social Security benefits	233,818	214,404	253,232
2007	Wealth	117,555	110,352	124,758
	Present value of future Social Security benefits	249,821	230,972	268,670
2010	Wealth	81,680	78,177	85,183
	Present value of future Social Security benefits	255,217	237,794	272,640
2013	Wealth	69,857	66,445	73,269
	Present value of future Social Security benefits	254,115	235,318	272,912
2016	Wealth	79,250	76,054	82,446
	Present value of future Social Security benefits	277,922	263,170	292,674
Third quintile 1989	Wealth	160,126	151,553	168,699
	Present value of future Social Security benefits	198,294	176,976	219,612
1992	Wealth	169,043	162,019	176,067
	Present value of future Social Security benefits	218,042	184,008	252,076
1995	Wealth	166,278	158,203	174,353
	Present value of future Social Security benefits	203,055	183,153	222,957
1998	Wealth	198,689	191,444	205,934
	Present value of future Social Security benefits	226,769	203,467	250,071

Appendix III: Additional Data Tables

			Average	Lower bound 95% confidence interval	Upper bound 95% confidence interval
	2001	Wealth	235,494	226,537	244,451
		Present value of future Social Security benefits	255,584	228,136	283,032
	2004	Wealth	271,644	259,931	283,357
		Present value of future Social Security benefits	289,239	256,217	322,261
	2007	Wealth	277,121	268,252	285,990
		Present value of future Social Security benefits	272,748	242,030	303,466
	2010	Wealth	223,395	217,258	229,532
		Present value of future Social Security benefits	310,375	289,551	331,199
	2013	Wealth	200,232	194,595	205,869
		Present value of future Social Security benefits	298,215	280,131	316,299
	2016	Wealth	222,520	215,274	229,766
		Present value of future Social Security benefits	304,792	286,678	322,906
Fourth quintile	1989	Wealth	330,736	313,251	348,221
		Present value of future Social Security benefits	214,615	187,969	241,261
	1992	Wealth	329,451	316,869	342,033
		Present value of future Social Security benefits	254,629	222,619	286,639
	1995	Wealth	328,754	314,884	342,624
		Present value of future Social Security benefits	249,608	217,797	281,419
	1998	Wealth	410,721	392,455	428,987
		Present value of future Social Security benefits	276,464	249,989	302,939
	2001	Wealth	529,288	505,950	552,626
		Present value of future Social Security benefits	303,293	275,331	331,255
	2004	Wealth	634,530	608,406	660,654
		Present value of future Social Security benefits	327,784	300,779	354,789
	2007	Wealth	582,745	561,626	603,864
		Present value of future Social Security benefits	354,606	329,896	379,316
	2010	Wealth	521,494	496,026	546,962
		Present value of future Social Security benefits	352,865	327,070	378,660
	2013	Wealth	453,683	438,887	468,479
		Present value of future Social Security benefits	355,964	337,913	374,015
	2016	Wealth	548,548	531,928	565,168
		Present value of future Social Security benefits	350,302	330,882	369,722
Top quintile	1989	Wealth	2,629,917	2,239,480	3,020,354
		Present value of future Social Security benefits	276,576	251,722	301,430
	1992	Wealth	2,059,744	1,857,517	2,261,971
		Present value of future Social Security benefits	313,598	288,373	338,823

Appendix III: Additional Data Tables

		Average	Lower bound 95% confidence interval	Upper bound 95% confidence interval
1995	Wealth	2,842,618	2,520,464	3,164,772
	Present value of future Social Security benefits	315,499	290,244	340,754
1998	Wealth	3,083,012	2,656,359	3,509,665
	Present value of future Social Security benefits	368,831	347,662	390,000
2001	Wealth	4,135,768	3,693,073	4,578,463
	Present value of future Social Security benefits	371,011	346,026	395,996
2004	Wealth	4,436,739	3,879,434	4,994,044
	Present value of future Social Security benefits	410,964	378,086	443,842
2007	Wealth	4,823,823	4,339,666	5,307,980
	Present value of future Social Security benefits	432,643	408,025	457,261
2010	Wealth	4,433,254	4,058,742	4,807,766
	Present value of future Social Security benefits	463,872	445,114	482,630
2013	Wealth	4,405,565	3,987,431	4,823,699
	Present value of future Social Security benefits	471,909	453,591	490,227
2016	Wealth	5,908,111	5,438,686	6,377,536
	Present value of future Social Security benefits	502,753	483,329	522,177

Source: GAO analysis of 1989 through 2016 Survey of Consumer Finances data. | GAO-19-587

Notes: We defined wealth as net worth, or assets minus debt. Averages represent mean estimates. The Survey of Consumer Finances is conducted every 3 years. Older households are those where the survey respondents or any spouses or partners were aged 55 or older in the year of the survey. We ranked these households by their wealth and broke them into five equally sized groups, or quintiles. Each year of data in our analysis, and, therefore, each quintile included different sets of households over time. There were insufficient data to produce an estimate of wealth for the bottom quintile in 2016.

Table 5: Confidence Intervals for Estimates Shown in Figure 6

			Average	Lower bound 95% confidence interval	Upper bound 95% confidence interval
2016 dollars					
Bottom quintile	1989	Wealth	n/a	n/a	n/a
		Present value of future Social Security benefits	136,339	117,483	155,195
		Present value of future pension benefits	91,031	67,319	114,743
	1992	Wealth	8,079	5,307	10,851
		Present value of future Social Security benefits	197,196	167,303	227,089
		Present value of future pension benefits	133,950	104,475	163,425
	1995	Wealth	9,690	5,320	14,060

Appendix III: Additional Data Tables

		Average	Lower bound 95% confidence interval	Upper bound 95% confidence interval	
	Present value of future Social Security benefits	148,556	131,031	166,081	
	Present value of future pension benefits	104,223	83,140	125,306	
1998	Wealth	11,967	8,939	14,995	
	Present value of future Social Security benefits	174,936	140,833	209,039	
	Present value of future pension benefits	135,340	103,256	167,424	
2001	Wealth	18,955	13,341	24,569	
	Present value of future Social Security benefits	200,750	170,911	230,589	
	Present value of future pension benefits	122,750	93,335	152,165	
2004	Wealth	n/a	n/a	n/a	
	Present value of future Social Security benefits	178,783	166,117	191,449	
	Present value of future pension benefits	127,019	100,416	153,622	
2007	Wealth	13,735	9,407	18,063	
	Present value of future Social Security benefits	231,773	203,509	260,037	
	Present value of future pension benefits	166,207	137,013	195,401	
2010	Wealth	n/a	n/a	n/a	
	Present value of future Social Security benefits	224,237	207,556	240,918	
	Present value of future pension benefits	183,092	148,243	217,941	
2013	Wealth	n/a	n/a	n/a	
	Present value of future Social Security benefits	246,122	224,081	268,163	
	Present value of future pension benefits	181,065	149,752	212,378	
2016	Wealth	n/a	n/a	n/a	
	Present value of future Social Security benefits	267,517	246,644	288,390	
	Present value of future pension benefits	215,058	224,882	257,693	
Second quintile	1989	Wealth	72,116	69,000	75,232
	Present value of future Social Security benefits	200,737	181,324	220,150	
	Present value of future pension benefits	160,904	120,592	201,216	
1992	Wealth	75,207	70,276	80,138	
	Present value of future Social Security benefits	218,618	196,718	240,518	
	Present value of future pension benefits	160,451	131,988	188,914	
1995	Wealth	76,528	70,341	82,715	
	Present value of future Social Security benefits	238,089	210,102	266,076	
	Present value of future pension benefits	203,408	161,371	245,445	
1998	Wealth	96,295	90,458	102,132	
	Present value of future Social Security benefits	217,569	190,463	244,675	
	Present value of future pension benefits	224,658	171,027	278,289	

Appendix III: Additional Data Tables

		Average	Lower bound 95% confidence interval	Upper bound 95% confidence interval	
2001	Wealth	98,184	93,056	103,312	
	Present value of future Social Security benefits	253,128	227,992	278,264	
	Present value of future pension benefits	198,832	166,551	231,113	
2004	Wealth	108,438	100,858	116,018	
	Present value of future Social Security benefits	231,191	203,178	259,204	
	Present value of future pension benefits	181,136	154,166	208,106	
2007	Wealth	112,654	104,736	120,572	
	Present value of future Social Security benefits	250,990	224,955	277,025	
	Present value of future pension benefits	184,847	158,058	211,636	
2010	Wealth	84,016	80,685	87,347	
	Present value of future Social Security benefits	268,151	248,425	287,877	
	Present value of future pension benefits	214,024	178,472	249,576	
2013	Wealth	73,145	69,323	76,967	
	Present value of future Social Security benefits	262,205	244,078	280,332	
	Present value of future pension benefits	232,312	209,300	255,324	
2016	Wealth	78,514	74,732	82,296	
	Present value of future Social Security benefits	284,713	267,077	302,349	
	Present value of future pension benefits	231,606	206,488	256,724	
Third quintile	1989	Wealth	156,584	149,274	163,894
		Present value of future Social Security benefits	231,516	208,534	254,498
		Present value of future pension benefits	185,438	146,092	224,784
	1992	Wealth	165,820	160,937	170,703
		Present value of future Social Security benefits	236,071	217,727	254,415
		Present value of future pension benefits	164,066	138,507	189,625
	1995	Wealth	176,271	169,579	182,963
		Present value of future Social Security benefits	252,141	224,150	280,132
		Present value of future pension benefits	206,678	170,289	243,067
	1998	Wealth	208,847	201,098	216,596
		Present value of future Social Security benefits	247,447	224,265	270,629
		Present value of future pension benefits	205,519	174,373	236,665
	2001	Wealth	245,916	235,698	256,134
		Present value of future Social Security benefits	278,218	250,739	305,697
		Present value of future pension benefits	270,930	220,696	321,164
	2004	Wealth	260,442	248,492	272,392
		Present value of future Social Security benefits	262,873	242,100	283,646

Appendix III: Additional Data Tables

		Average	Lower bound 95% confidence interval	Upper bound 95% confidence interval	
	Present value of future pension benefits	256,079	222,757	289,401	
2007	Wealth	271,687	263,260	280,114	
	Present value of future Social Security benefits	275,007	250,668	299,346	
	Present value of future pension benefits	188,456	165,154	211,758	
2010	Wealth	222,312	216,472	228,152	
	Present value of future Social Security benefits	288,122	262,632	313,612	
	Present value of future pension benefits	266,096	223,383	308,809	
2013	Wealth	199,286	192,783	205,789	
	Present value of future Social Security benefits	283,937	262,989	304,885	
	Present value of future pension benefits	235,561	205,088	266,034	
2016	Wealth	223,515	217,824	229,206	
	Present value of future Social Security benefits	342,452	318,740	366,164	
	Present value of future pension benefits	311,441	267,616	355,266	
Fourth quintile	1989	Wealth	329,811	315,855	343,767
	Present value of future Social Security benefits	267,950	243,390	292,510	
	Present value of future pension benefits	283,063	215,401	350,725	
1992	Wealth	331,472	320,066	342,878	
	Present value of future Social Security benefits	270,391	251,187	289,595	
	Present value of future pension benefits	238,977	186,460	291,494	
1995	Wealth	332,820	320,856	344,784	
	Present value of future Social Security benefits	293,065	263,262	322,868	
	Present value of future pension benefits	298,321	256,544	340,098	
1998	Wealth	410,289	394,918	425,660	
	Present value of future Social Security benefits	297,710	271,752	323,668	
	Present value of future pension benefits	315,381	276,340	354,422	
2001	Wealth	532,200	512,746	551,654	
	Present value of future Social Security benefits	312,007	284,806	339,208	
	Present value of future pension benefits	289,254	250,933	327,575	
2004	Wealth	621,589	596,901	646,277	
	Present value of future Social Security benefits	334,341	310,657	358,025	
	Present value of future pension benefits	398,180	345,061	451,299	
2007	Wealth	592,823	574,329	611,317	
	Present value of future Social Security benefits	344,450	310,629	378,271	
	Present value of future pension benefits	366,478	312,903	420,053	
2010	Wealth	514,978	502,406	527,550	

Appendix III: Additional Data Tables

		Average	Lower bound 95% confidence interval	Upper bound 95% confidence interval	
	Present value of future Social Security benefits	348,444	329,725	367,163	
	Present value of future pension benefits	342,813	314,008	371,618	
2013	Wealth	451,304	437,273	465,335	
	Present value of future Social Security benefits	351,746	329,145	374,347	
	Present value of future pension benefits	388,378	337,894	438,862	
2016	Wealth	561,148	545,455	576,841	
	Present value of future Social Security benefits	380,007	362,593	397,421	
	Present value of future pension benefits	391,331	353,607	4290,55	
Top quintile	1989	Wealth	1,589,829	1,290,473	1,889,185
	Present value of future Social Security benefits	299,305	269,543	329,067	
	Present value of future pension benefits	470,859	377,328	564,390	
1992	Wealth	1,575,503	1,391,435	1,759,571	
	Present value of future Social Security benefits	311,283	286,888	335,678	
	Present value of future pension benefits	408,828	353,343	464,313	
1995	Wealth	1,418,341	1,235,201	1,601,481	
	Present value of future Social Security benefits	368,272	345,049	391,495	
	Present value of future pension benefits	456,740	364,830	548,650	
1998	Wealth	1,915,726	1,665,020	2,166,432	
	Present value of future Social Security benefits	339,808	310,755	368,861	
	Present value of future pension benefits	514,848	401,639	628,057	
2001	Wealth	2,660,638	2,336,884	2,984,392	
	Present value of future Social Security benefits	387,508	357,226	417,790	
	Present value of future pension benefits	465,023	395,443	534,603	
2004	Wealth	2,544,041	2,272,360	2,815,722	
	Present value of future Social Security benefits	387,036	354,915	419,157	
	Present value of future pension benefits	533,784	452,875	6146,93	
2007	Wealth	2,951,552	2,557,691	3,345,413	
	Present value of future Social Security benefits	379,124	352,177	406,071	
	Present value of future pension benefits	526,390	398,436	654,344	
2010	Wealth	2,535,969	2,243,609	2,828,329	
	Present value of future Social Security benefits	452,544	421,983	483,105	
	Present value of future pension benefits	585,135	512,776	657,494	
2013	Wealth	2,428,072	2,175,443	2,680,701	
	Present value of future Social Security benefits	462,330	4397,74	484,886	
	Present value of future pension benefits	577,853	511,690	644,016	

Appendix III: Additional Data Tables

		Average	Lower bound 95% confidence interval	Upper bound 95% confidence interval
2016	Wealth	3,070,518	2,791,873	3,349,163
	Present value of future Social Security benefits	457,046	435,091	479,001
	Present value of future pension benefits	643,349	567,082	719,616

Source: GAO analysis of 1989 through 2016 Survey of Consumer Finances data. | GAO-19-587

Notes: We defined wealth as net worth, or assets minus debt. Averages represent mean estimates. The Survey of Consumer Finances is conducted every 3 years. Older households are those where the survey respondents or any spouses or partners were aged 55 or older in the year of the survey. We ranked these households by their wealth and broke them into five equally sized groups, or quintiles. Each year of data in our analysis, and, therefore, each quintile included different sets of households over time. There were insufficient data to produce an estimate of wealth for the bottom quintile in 1989, 2004, 2010, 2013, and 2016.

Table 6: Confidence Intervals for Estimated Percentage of Older Households with Retirement Account Balances by Amount in 2016, as shown in Figure 10

		Percentage of households	Lower bound 95% confidence interval	Upper bound 95% confidence interval
Bottom quintile	No retirement account	88.9	87.0	90.8
	Retirement account balance of \$50,000 or less	10.4	8.6	12.3
	Retirement account balance between \$50,001 and \$100,000	0.6	0.1	1.1
	Retirement account balance between \$100,001 and \$150,000	0.1	0.0	0.1
	Retirement account balance between \$150,001 and \$200,000	—	—	—
	Retirement account balance between \$200,001 and \$250,000	—	—	—
	Retirement account balance between \$250,001 and \$300,000	—	—	—
	Retirement account balance between \$300,001 and \$350,000	—	—	—
	Retirement account balance between \$350,001 and \$400,000	—	—	—
	Retirement account balance between \$400,001 and \$450,000	—	—	—
	Retirement account balance between \$450,001 and \$500,000	—	—	—
	Retirement account balance of more than \$500,000	—	—	—
Second quintile	No retirement account balance	67.4	63.6	71.2
	Retirement account balance of \$50,000 or less	26.3	22.7	29.9

Appendix III: Additional Data Tables

		Percentage of households	Lower bound 95% confidence interval	Upper bound 95% confidence interval
	Retirement account balance between \$50,001 and \$100,000	5.2	3.8	6.6
	Retirement account balance between \$100,001 and \$150,000	1.1	0.2	1.9
	Retirement account balance between \$150,001 and \$200,000	—	—	—
	Retirement account balance between \$200,001 and \$250,000	—	—	—
	Retirement account balance between \$250,001 and \$300,000	—	—	—
	Retirement account balance between \$300,001 and \$350,000	—	—	—
	Retirement account balance between \$350,001 and \$400,000	—	—	—
	Retirement account balance between \$400,001 and \$450,000	—	—	—
	Retirement account balance between \$450,001 and \$500,000	—	—	—
	Retirement account balance of more than \$500,000	—	—	—
Third quintile	No retirement account balance	44.5	40.8	48.2
	Retirement account balance of \$50,000 or less	24.8	21.8	27.9
	Retirement account balance between \$50,001 and \$100,000	13.9	10.5	17.3
	Retirement account balance between \$100,001 and \$150,000	7.5	4.9	10.1
	Retirement account balance between \$150,001 and \$200,000	5.8	3.8	7.8
	Retirement account balance between \$200,001 and \$250,000	2.7	1.5	4.0
	Retirement account balance between \$250,001 and \$300,000	0.6	0.0	1.2
	Retirement account balance between \$300,001 and \$350,000	0.2	0.0	0.4
	Retirement account balance between \$350,001 and \$400,000	—	—	—
	Retirement account balance between \$400,001 and \$450,000	—	—	—
	Retirement account balance between \$450,001 and \$500,000	—	—	—
	Retirement account balance of more than \$500,000	—	—	—
Fourth quintile	no retirement account balance	26.5	23.8	29.2

Appendix III: Additional Data Tables

	Percentage of households	Lower bound 95% confidence interval	Upper bound 95% confidence interval
Retirement account balance of \$50,000 or less	14.5	11.9	17.1
Retirement account balance between \$50,001 and \$100,000	11.0	8.7	13.3
Retirement account balance between \$100,001 and \$150,000	9.6	7.4	11.8
Retirement account balance between \$150,001 and \$200,000	9.2	6.8	11.5
Retirement account balance between \$200,001 and \$250,000	8.5	6.7	10.3
Retirement account balance between \$250,001 and \$300,000	4.4	2.9	5.9
Retirement account balance between \$300,001 and \$350,000	4.1	2.2	6.1
Retirement account balance between \$350,001 and \$400,000	2.7	1.7	3.8
Retirement account balance between \$400,001 and \$450,000	4.8	3.3	6.2
Retirement account balance between \$450,001 and \$500,000	1.8	1.0	2.6
Retirement account balance of more than \$500,000	3.0	1.9	4.0
Fifth quintile No retirement account balance	14.1	11.7	16.5
Retirement account balance of \$50,000 or less	5.0	3.3	6.6
Retirement account balance between \$50,001 and \$100,000	3.9	2.4	5.4
Retirement account balance between \$100,001 and \$150,000	3.8	2.7	5.0
Retirement account balance between \$150,001 and \$200,000	3.6	2.5	4.8
Retirement account balance between \$200,001 and \$250,000	3.3	2.1	4.4
Retirement account balance between \$250,001 and \$300,000	2.8	1.7	4.0
Retirement account balance between \$300,001 and \$350,000	4.2	2.6	5.7
Retirement account balance between \$350,001 and \$400,000	3.5	1.9	5.0
Retirement account balance between \$400,001 and \$450,000	3.1	1.3	4.9
Retirement account balance between \$450,001 and \$500,000	2.3	1.2	3.4
Retirement account balance of more than \$500,000	50.4	46.4	54.4

Source: GAO analysis of 2016 Survey of Consumer Finances data. | GAO-19-587

— No households had retirement account balance within this range

Notes: Retirement accounts include amounts in defined contribution plans and individual retirement accounts. Some households may not have retirement accounts but may have a defined benefit pension. The Survey of Consumer Finances is conducted every 3 years. Older households are those where the survey respondents or any spouses or partners were aged 55 or older in the year of the survey. We ranked these households by their net worth and broke them into five equally sized groups, or quintiles. Each year of data in our analysis, and, therefore, each quintile included different sets of households over time.

Table 7: Estimated Median Household Income for Individuals Born in 1931-1941 and Their Spouses or Partners, as They Aged, by Mid-Career Earnings Level and Race and Ethnicity

		Household head is white, non-Hispanic	Lower bound 99% confidence interval	Upper bound 99% confidence interval	Household head is a minority	Lower bound 99% confidence interval	Upper bound 99% confidence interval	
2016 dollars								
Bottom quintile	1992	36,171	29,477	42,865	16,079	13,244	18,914	
	1994	32,440	27,209	37,671	14,397	12,585	16,209	
	1996	31,406	26,303	36,509	13,948	10,606	17,290	
	1998	32,472	27,690	37,254	14,746	11,739	17,753	
	2000	35,385	29,602	41,168	14,179	11,431	16,927	
	2002	32,382	26,154	38,610	14,447	11,054	17,840	
	2004	30,077	25,330	34,824	13,817	11,682	15,952	
	2006	26,343	22,042	30,644	11,741	9,591	13,891	
	2008	24,215	20,293	28,137	12,022	10,527	13,517	
	2010	24,541	21,188	27,894	11,908	10,492	13,324	
	2012	22,247	19,045	25,449	12,073	11,046	13,100	
	2014	21,105	18,267	23,943	11,376	10,037	12,715	
	Second quintile	1992	43,795	39,008	48,582	30,771	26,720	34,822
		1994	42,652	36,991	48,313	31,851	26,189	37,513
1996		45,811	40,513	51,109	28,149	23,201	33,097	
1998		43,646	38,562	48,730	27,087	22,415	31,759	
2000		40,931	35,836	46,026	24,823	19,525	30,121	
2002		38,347	35,268	41,426	24,193	19,130	29,256	
2004		35,243	30,658	39,828	24,944	21,458	28,430	
2006		32,277	29,061	35,493	21,297	19,179	23,415	
2008		29,152	25,448	32,856	19,485	16,729	22,241	
2010		26,968	23,469	30,467	17,930	15,048	20,812	
2012		27,544	24,441	30,647	16,444	14,206	18,682	
2014		25,963	21,856	30,070	16,790	15,277	18,303	
Third quintile		1992	58,824	53,309	64,339	57,217	52,670	61,764
		1994	56,650	49,885	63,415	51,797	45,465	58,129

Appendix III: Additional Data Tables

		Household head is white, non-Hispanic	Lower bound 99% confidence interval	Upper bound 99% confidence interval	Household head is a minority	Lower bound 99% confidence interval	Upper bound 99% confidence interval
	1996	56,787	50,642	62,932	47,608	39,314	55,902
	1998	53,645	46,993	60,297	43,133	31,987	54,279
	2000	49,904	41,984	57,824	40,518	34,086	46,950
	2002	48,359	43,745	52,973	39,233	31,959	46,507
	2004	42,296	37,355	47,237	39,801	33,578	46,024
	2006	43,037	38,418	47,656	32,870	25,935	39,805
	2008	38,559	33,757	43,361	27,955	21,822	34,088
	2010	35,490	31,654	39,326	27,540	21,875	33,205
	2012	33,412	29,805	37,019	25,125	20,699	29,551
	2014	33,908	30,058	37,758	24,339	20,593	28,085
Fourth quintile	1992	80,627	75,207	86,047	77,568	67,712	87,424
	1994	78,668	73,542	83,794	70,417	54,501	86,333
	1996	77,718	73,324	82,112	74,015	63,995	84,035
	1998	75,578	70,464	80,692	56,544	42,122	70,966
	2000	73,462	69,640	77,284	51,888	36,509	67,267
	2002	63,984	57,143	70,825	50,258	34,778	65,738
	2004	58,785	53,718	63,852	47,581	35,321	59,841
	2006	53,064	48,585	57,543	41,793	33,197	50,389
	2008	49,767	45,330	54,204	41,441	30,690	52,192
	2010	47,038	43,926	50,150	39,426	31,903	46,949
	2012	43,193	39,295	47,091	36,399	30,567	42,231
	2014	42,021	39,055	44,987	32,366	27,734	36,998
Top quintile	1992	120,941	113,980	127,902	119,803	84,857	154,749
	1994	124,372	115,894	132,850	118,316	98,763	137,869
	1996	116,325	105,734	126,916	108,643	83,539	133,747
	1998	110,944	100,836	121,052	96,496	80,157	112,835
	2000	102,206	91,907	112,505	95,380	71,180	119,580
	2002	89,098	78,654	99,542	81,936	46,387	117,485
	2004	86,215	76,502	95,928	80,942	49,445	112,439
	2006	79,523	73,028	86,018	67,203	50,245	84,161
	2008	68,071	60,632	75,510	64,396	39,057	89,735
	2010	63,937	59,140	68,734	64,304	41,639	86,969
	2012	58,560	53,351	63,769	50,003	32,856	67,150
	2014	57,076	52,076	62,076	57,128	40,797	73,459

Source: GAO analysis of 1992 to 2014 Health and Retirement Study data. | GAO-19-587

Notes: Income figures are estimates aggregated across all sources, such as wages, Social Security benefits, or pensions. For the purposes of this analysis, minority is defined as someone who is non-white or Hispanic. These data were insufficient for breaking out results by specific race and ethnicity categories. We ranked households by their mid-career earnings and broke them into five equally sized groups, or quintiles. We defined mid-career household earnings based on earnings reported to the Social Security Administration for years when the survey respondents were ages 41 through 50, as well the earnings of their spouses or partners during those years if the respondents were part of a couple in 1992. We conducted our analysis for households where the heads of household were born in 1931-1941; these individuals were ages 51 through 61 in 1992 and ages 73 through 83 in 2014. All amounts are presented in 2016 dollars. We examined medians but not means, due to distributional skew caused by outliers. The Health and Retirement Study is a longitudinal survey that collects information from the same households in their sample every 2 years.

Table 8: Estimated Median Household Wealth for Individuals Born in 1931-1941 and Their Spouses or Partners, as They Aged, by Mid-Career Earnings Level and Race and Ethnicity

		Household head is white, non-Hispanic	Lower bound 99% confidence interval	Upper bound 99% confidence interval	Household head is a minority	Lower bound 99% confidence interval	Upper bound 99% confidence interval	
2016 dollars								
Bottom quintile	1992	149,509	98,566	200,452	11,482	-2,507	25,471	
	1994	153,677	98,023	209,331	16,463	-12,362	45,288	
	1996	176,441	120,825	232,057	14,555	-8,999	38,109	
	1998	158,044	100,949	215,139	12,376	-6,980	31,732	
	2000	174,247	104,536	243,958	20,114	2,238	37,990	
	2002	181,127	127,145	235,109	16,755	-486	33,996	
	2004	174,228	125,378	223,078	14,208	253	28,163	
	2006	164,409	125,633	203,185	13,294	-6,564	33,152	
	2008	150,678	98,502	202,854	10,448	-5,684	26,580	
	2010	131,956	85,562	178,350	7,067	-13524	27,658	
	2012	131,625	92,969	170,281	7,283	-4,988	19,554	
	2014	121,795	67,419	176,171	2,827	-8,368	14,022	
	Second quintile	1992	132,178	97,351	167,005	40,914	24,931	56,897
		1994	134,660	93,906	175,414	47,411	28,753	66,069
1996		145,674	119,952	171,396	51,693	35,516	67,870	
1998		136,147	109,305	162,989	49,649	35,012	64,286	
2000		146,423	106,850	185,996	54,044	32,612	75,476	
2002		156,673	116,328	197,018	57,957	39,625	76,289	
2004		137,454	83,329	191,579	56,643	41,184	72,102	
2006		178,958	115,403	242,513	55,644	37,014	74,274	
2008		126,488	86,817	166,159	55,739	38,766	72,712	
2010		117,552	89,292	145,812	53,446	29,756	77,136	
2012	104,701	88,166	121,236	43,544	23,769	63,319		

Appendix III: Additional Data Tables

		Household head is white, non-Hispanic	Lower bound 99% confidence interval	Upper bound 99% confidence interval	Household head is a minority	Lower bound 99% confidence interval	Upper bound 99% confidence interval
	2014	107,975	90,066	125,884	42,160	29,052	55,268
Third quintile	1992	174,340	136,492	212,188	84,370	47,553	121,187
	1994	191,068	152,867	229,269	101,038	84,699	117,377
	1996	188,906	151,676	226,136	98,573	50,704	146,442
	1998	209,035	168,534	249,536	104,602	59,853	149,351
	2000	231,324	180,779	281,869	103,174	74,711	131,637
	2002	195,454	160,773	230,135	101,900	71,817	131,983
	2004	219,273	170,461	268,085	117,752	75,451	160,053
	2006	230,352	175,845	284,859	97,838	40,691	154,985
	2008	205,144	161,538	248,750	87,576	46,951	128,201
	2010	198,536	155,579	241,493	89,358	49,177	129,539
	2012	178,043	147,901	208,185	68,070	38,329	97,811
	2014	165,342	131,832	198,852	72,359	43,007	101,711
Fourth quintile	1992	241,971	211,724	272,218	154,451	103,788	205,114
	1994	266,582	237,219	295,945	183,215	113,590	252,840
	1996	306,232	261,735	350,729	199,549	130,615	268,483
	1998	318,693	273,618	363,768	199,451	153,922	244,980
	2000	340,673	292,523	388,823	172,439	110,358	234,520
	2002	339,417	293,027	385,807	212,078	151,919	272,237
	2004	365,590	317,924	413,256	212,750	128,370	297,130
	2006	378,525	314,746	442,304	266,220	138,482	393,958
	2008	371,292	317,088	425,496	244,855	129,365	360,345
	2010	310,035	261,123	358,947	191,032	136,342	245,722
	2012	273,186	221,367	325,005	153,613	112,454	194,772
	2014	279,105	233,898	324,312	170,645	126,252	215,038
Top quintile	1992	444,257	392,222	496,292	273,760	194,523	352,997
	1994	499,552	429,181	569,923	366,547	241,056	492,038
	1996	551,466	493,843	609,089	301,603	158,570	444,636
	1998	619,941	559,653	680,229	353,797	287,245	420,349
	2000	674,815	569,863	779,767	307,440	190,237	424,643
	2002	701,992	618,353	785,631	371,296	246,604	495,988
	2004	684,677	599,191	770,163	321,820	153,032	490,608
	2006	752,315	650,284	854,346	405,599	270,465	540,733
	2008	701,262	604,761	797,763	323,909	182,317	465,501
	2010	641,303	523,510	759,096	352,789	207,114	498,464
	2012	586,852	460,172	713,532	214,865	121,857	307,873

Appendix III: Additional Data Tables

	Household head is white, non-Hispanic	Lower bound 99% confidence interval	Upper bound 99% confidence interval	Household head is a minority	Lower bound 99% confidence interval	Upper bound 99% confidence interval
2014	590,418	482,058	698,778	296,403	214,826	377,980

Source: GAO analysis of 1992 to 2014 Health and Retirement Study data. | GAO-19-587

Notes: For this analysis, we defined wealth as net worth. This definition includes nonfinancial assets, such as home equity and the value of vehicles, in addition to financial assets. Wealth figures are estimates. We ranked households by their mid-career earnings and broke them into five equally sized groups, or quintiles. We defined mid-career household earnings based on earnings reported to the Social Security Administration for years when the survey respondents were ages 41 through 50, as well as the earnings of their spouses or partners during those years if the respondents were part of a couple in 1992. We conducted our analysis for households where the heads of household were born in 1931-1941; these individuals were ages 51 through 61 in 1992 and ages 73 through 83 in 2014. All amounts are presented in 2016 dollars. We examined medians but not means, due to distributional skew caused by outliers. The Health and Retirement Study is a longitudinal survey that collects information from the same households in their sample every 2 years.

Table 9: Estimated Median Household Income for Individuals Born in 1931-1941 and Their Spouses or Partners, as They Aged, by Mid-Career Earnings Level and Education

		Household head attended at least some college	Lower bound 99% confidence interval	Upper bound 99% confidence interval	Household head did not attend college	Lower bound 99% confidence interval	Upper bound 99% confidence interval
2016 dollars							
Bottom quintile	1992	51,187	41,959	60,415	19,924	14,388	25,460
	1994	41,005	18,405	63,605	20,758	17,857	23,659
	1996	42,676	25,111	60,241	21,245	19,075	23,415
	1998	46,598	34,235	58,961	20,798	17,632	23,964
	2000	46,823	35,106	58,540	20,677	16,386	24,968
	2002	42,846	34,194	51,498	21,147	16,756	25,538
	2004	36,506	28,415	44,597	18,974	15,549	22,399
	2006	37,318	25,166	49,470	16,359	13,202	19,516
	2008	34,562	23,256	45,868	16,046	13,333	18,759
	2010	30,052	21,583	38,521	16,818	15,018	18,618
2012	27,225	19,729	34,721	16,148	14,544	17,752	
2014	24,537	15,478	33,596	14,821	12,606	17,036	
Second quintile	1992	52,692	47,091	58,293	35,726	32,797	38,655
	1994	55,674	45,521	65,827	34,306	30,841	37,771
	1996	53,504	46,387	60,621	35,118	31,314	38,922
	1998	53,312	44,408	62,216	33,379	30,593	36,165
	2000	53,587	41,158	66,016	30,765	27,041	34,489
	2002	48,188	38,197	58,179	30,410	27,498	33,322

Appendix III: Additional Data Tables

		Household head attended at least some college	Lower bound 99% confidence interval	Upper bound 99% confidence interval	Household head did not attend college	Lower bound 99% confidence interval	Upper bound 99% confidence interval
	2004	45,365	35,856	54,874	26,959	24,375	29,543
	2006	40,614	33,602	47,626	23,399	19,839	26,959
	2008	36,733	31,666	41,800	21,305	18,642	23,968
	2010	35,107	28,078	42,136	20,045	17,301	22,789
	2012	37,904	32,920	42,888	18,838	17,277	20,399
	2014	36,570	30,144	42,996	19,084	16,833	21,335
Third quintile	1992	71,694	63,056	80,332	51,950	47,397	56,503
	1994	70,778	59,224	82,332	48,732	42,833	54,631
	1996	73,345	64,954	81,736	47,375	42,300	52,450
	1998	68,842	59,032	78,652	44,273	38,165	50,381
	2000	66,217	53,019	79,415	40,535	35,055	46,015
	2002	62,086	47,364	76,808	39,773	34,618	44,928
	2004	58,717	44,154	73,280	36,710	33,001	40,419
	2006	55,953	48,263	63,643	32,990	29,428	36,552
	2008	47,896	41,154	54,638	31,514	26,677	36,351
	2010	44,676	36,424	52,928	29,545	26,343	32,747
	2012	41,876	34,923	48,829	26,862	24,568	29,156
	2014	39,366	32,473	46,259	26,793	24,376	29,210
Fourth quintile	1992	90,297	82,579	98,015	72,537	68,154	76,920
	1994	90,873	85,865	95,881	70,355	64,207	76,503
	1996	91,827	83,045	100,609	67,655	62,293	73,017
	1998	84,283	76,070	92,496	63,651	57,368	69,934
	2000	86,019	78,162	93,876	59,020	52,803	65,237
	2002	75,705	61,638	89,772	52,796	46,923	58,669
	2004	75,366	69,109	81,623	48,906	45,002	52,810
	2006	64,815	59,583	70,047	45,196	41,448	48,944
	2008	62,181	55,166	69,196	41,523	38,009	45,037
	2010	56,271	48,665	63,877	41,072	37,914	44,230
	2012	54,408	48,061	60,755	37,431	33,887	40,975
	2014	50,580	42,127	59,033	35,358	32,906	37,810
Top quintile	1992	140,351	131,507	149,195	96,598	90,142	103,054
	1994	142,950	128,959	156,941	98,009	88,451	107,567
	1996	139,212	125,135	153,289	91,080	82,636	99,524
	1998	128,950	114,946	142,954	77,760	65,034	90,486
	2000	118,112	105,544	130,680	73,417	66,064	80,770

Appendix III: Additional Data Tables

	Household head attended at least some college	Lower bound 99% confidence interval	Upper bound 99% confidence interval	Household head did not attend college	Lower bound 99% confidence interval	Upper bound 99% confidence interval
2002	108,619	90,839	126,399	64,364	57,158	71,570
2004	103,909	92,231	115,587	58,819	51,367	66,271
2006	90,308	79,929	100,687	51,943	44,505	59,381
2008	82,611	72,934	92,288	51,376	45,640	57,112
2010	76,184	69,864	82,504	47,280	41,805	52,755
2012	69,855	64,207	75,503	43,529	38,635	48,423
2014	67,639	59,832	75,446	42,224	37,929	46,519

Source: GAO analysis of 1992 to 2014 Health and Retirement Study data. | GAO-19-587

Notes: Income figures are estimates aggregated across all sources, such as wages, Social Security benefits, or pensions. "Some college" refers to those households where the head had at least some college education, and "No college" refers to those households where the head did not attend college. We defined mid-career household earnings based on earnings reported to the Social Security Administration for years when the survey respondents were ages 41 through 50, as well as the earnings of their spouses or partners during those years if the respondents were part of a couple in 1992. We conducted our analysis for households where the heads of household were born in 1931-1941; these individuals were ages 51 through 61 in 1992 and ages 73 through 83 in 2014. All amounts are presented in 2016 dollars. We examined medians but not means, due to distributional skew caused by outliers. The Health and Retirement Study is a longitudinal survey that collects information from the same households in their sample every 2 years.

Table 10: Estimated Median Household Wealth for Individuals Born in 1931-1941 and Their Spouses or Partners, as They Aged, by Mid-Career Earnings Level and Education

		Household head attended at least some college	Lower bound 99% confidence interval	Upper bound 99% confidence interval	Household head did not attend college	Lower bound 99% confidence interval	Upper bound 99% confidence interval
Bottom quintile	1992	236,846	131,762	341,930	61,294	33,004	89,584
	1994	296,306	200,612	392,000	62,147	35,457	88,837
	1996	212,474	119,451	305,497	68,736	43,169	94,303
	1998	218,941	145,081	292,801	71,597	41,922	101,272
	2000	273,120	163,819	382,421	63,728	41,505	85,951
	2002	254,459	188,316	320,602	65,348	40,015	90,681
	2004	225,560	76,037	375,083	60,206	31,346	89,066
	2006	226,496	63,607	389,385	54,728	30,302	79,154
	2008	225,738	106,138	345,338	44,694	21,933	67,455
	2010	176,037	81,742	270,332	44,269	12,375	76,163
Second quintile	2012	173,250	85,302	261,198	41,560	23,069	60,051
	2014	156,744	52,909	260,579	36,653	15,489	57,817
	1992	178,071	129,814	226,328	67,439	53,428	81,450

Appendix III: Additional Data Tables

		Household head attended at least some college	Lower bound 99% confidence interval	Upper bound 99% confidence interval	Household head did not attend college	Lower bound 99% confidence interval	Upper bound 99% confidence interval
	1994	209,793	147,335	272,251	72,148	54,846	89,450
	1996	204,816	158,577	251,055	72,826	56,251	89,401
	1998	193,014	119,815	266,213	74,881	55,483	94,279
	2000	230,247	149,605	310,889	83,845	65,773	101,917
	2002	223,491	137,135	309,847	87,902	68,851	106,953
	2004	225,219	115,351	335,087	78,912	60,629	97,195
	2006	242,662	151,186	334,138	85,998	60,714	111,282
	2008	206,451	119,623	293,279	78,936	62,139	95,733
	2010	174,986	113,883	236,089	69,537	48,047	91,027
	2012	155,539	55,352	255,726	61,979	46,358	77,600
	2014	161,304	105,934	216,674	58,708	38,885	78,531
Third quintile	1992	207,043	156,770	257,316	127,421	99,261	155,581
	1994	235,247	166,173	304,321	144,889	113,212	176,566
	1996	242,164	158,820	325,508	148,146	123,959	172,333
	1998	255,415	177,736	333,094	149,680	120,988	178,372
	2000	290,831	217,009	364,653	149,283	112,641	185,925
	2002	240,862	142,504	339,220	151,166	125,341	176,991
	2004	248,665	131,150	366,180	158,500	127,270	189,730
	2006	301,895	186,413	417,377	162,477	118,708	206,246
	2008	263,660	145,096	382,224	161,872	131,150	192,594
	2010	247,567	145,363	349,771	148,771	115,713	181,829
	2012	205,034	123,151	286,917	124,582	97,135	152,029
	2014	211,825	135,542	288,108	122,605	97,241	147,969
Fourth quintile	1992	286,332	243,283	329,381	208,557	174,648	242,466
	1994	293,245	233,758	352,732	226,795	200,301	253,289
	1996	335,678	274,471	396,885	246,419	206,543	286,295
	1998	387,394	317,987	456,801	239,749	204,595	274,903
	2000	419,976	353,589	486,363	246,324	194,003	298,645
	2002	427,417	358,913	495,921	237,690	190,684	284,696
	2004	450,128	353,915	546,341	279,378	239,307	319,449
	2006	485,537	397,955	573,119	298,636	228,601	368,671
	2008	474,673	402,917	546,429	266,028	212,149	319,907
	2010	415,068	346,076	484,060	242,646	198,140	287,152
	2012	386,081	310,352	461,810	220,098	186,508	253,688
	2014	341,585	272,885	410,285	211,870	178,001	245,739

Appendix III: Additional Data Tables

		Household head attended at least some college	Lower bound 99% confidence interval	Upper bound 99% confidence interval	Household head did not attend college	Lower bound 99% confidence interval	Upper bound 99% confidence interval
Top quintile	1992	494,315	428,341	560,289	328,586	275,328	381,844
	1994	551,723	442,085	661,361	382,449	329,700	435,198
	1996	651,894	556,717	747,071	401,867	335,688	468,046
	1998	693,729	559,019	828,439	416,042	349,352	482,732
	2000	766,919	639,498	894,340	470,251	380,734	559,768
	2002	783,169	667,784	898,554	446,158	374,403	517,913
	2004	780,166	630,966	929,366	450,120	343,810	556,430
	2006	897,131	745,101	1,049,161	4670,06	368,727	565,285
	2008	819,025	684,181	953,869	444,383	354,406	534,360
	2010	770,498	640,999	899,997	362,882	280,634	445,130
	2012	696,597	555,467	837,727	328,182	259,108	397,256
	2014	712,214	596,545	827,883	325,770	273,857	377,683

Source: GAO analysis of 1992 to 2014 Health and Retirement Study data. | GAO-19-587

Notes: Wealth is aggregated across all sources of net worth, such as retirement accounts, real estate, or investments. It does not include future income expected from Social Security or defined benefit pensions. Wealth figures are estimates. "Some college" refers to those households where the head had at least some college education, and "No college" refers to those households where the head did not attend college. We defined mid-career household earnings based on earnings reported to the Social Security Administration for years when the survey respondents were ages 41 through 50, as well the earnings of their spouses or partners during those years if the respondents were part of a couple in 1992. We conducted our analysis for households where the heads of household were born in 1931-1941; these individuals were ages 51 through 61 in 1992 and ages 73 through 83 in 2014. All amounts are presented in 2016 dollars. We examined medians but not means, due to distributional skew caused by outliers. The Health and Retirement Study is a longitudinal survey that collects information from the same households in their sample every 2 years.

Appendix IV: Additional Survival Analysis Results

This appendix contains additional results from our survival analysis, as shown in the tables below.

Table 11: Proportion of Those Ages 51 to 61 in 1992 Living to Ages 73 to 83 in 2014, By Mid-Career Household Earnings

Years after initial interview	Proportion of individuals alive, by mid-career household earnings				
	Bottom quintile	Second quintile	Third quintile	Fourth quintile	Top quintile
1	98.4	98.8	99.6	99.8	99.4
2	97.1	98.0	99.1	99.2	99.0
3	95.3	96.6	98.2	98.5	98.0
4	94.4	95.7	97.3	97.6	97.7
5	92.9	94.3	96.3	97.3	97.2
6	91.3	93.1	94.7	96.7	96.7
7	89.8	91.3	93.7	95.2	95.6
8	87.2	89.3	92.2	94.3	95.0
9	85.1	87.0	91.2	92.8	93.8
10	82.2	85.4	90.1	91.8	92.8
11	80.6	84.0	88.7	90.7	92.2
12	78.0	81.9	87.0	89.2	91.4
13	75.7	79.9	85.2	87.3	90.1
14	72.8	77.9	84.0	86.1	88.9
15	71.3	76.4	82.0	84.0	86.8
16	68.0	73.3	80.0	82.1	85.6
17	65.8	71.1	76.5	79.9	83.7
18	63.3	68.2	74.0	78.1	81.8
19	60.4	66.0	71.8	75.2	80.3
20	57.3	63.5	68.5	73.0	78.3
21	54.8	60.8	65.9	70.7	76.2
22	52.2	57.8	63.1	68.9	74.4

Source: GAO analysis of 1992 to 2014 Health and Retirement Study data. | GAO-19-587

Notes: The proportion of individuals alive was estimated using a Kaplan-Meier survival analysis, with survival time measured from the respondent's first interview during the 1992 wave of the HRS at ages 51 to 61. We defined mid-career household earnings based on earnings reported to the Social Security Administration for years when the survey respondents were ages 41 through 50, as well the earnings of their spouses or partners during those years if the respondents were part of a couple in 1992. We ranked these households by their mid-career household earnings and broke them into five equally sized groups, or quintiles.

Appendix IV: Additional Survival Analysis Results

Table 12: Proportion of Those Ages 51 to 61 in 1992 Living to Ages 73 to 83 in 2014, By Health and Earnings Categories

Years after initial interview	Proportion of individuals alive, by scenario		
	Low scenario: Bottom mid-career earnings quintile, no college education	Middle scenario: Middle mid-career earnings quintile, high school diploma or some college	High scenario: Top mid-career earnings quintile, college degree
1	98.4	99.4	99.6
2	97.0	98.7	99.3
3	95.2	98.0	98.5
4	93.9	97.3	98.5
5	92.2	96.1	98.1
6	90.8	95.0	98.1
7	89.0	93.9	97.8
8	86.4	93.2	97.1
9	84.3	92.0	96.2
10	81.3	90.7	95.6
11	79.3	89.1	95.4
12	77.0	87.9	94.9
13	75.0	85.9	94.0
14	72.0	85.0	93.6
15	70.1	82.7	90.9
16	66.3	81.1	89.2
17	63.9	77.2	87.6
18	61.8	75.1	85.4
19	58.9	72.7	85.0
20	55.6	69.6	83.5
21	52.5	67.1	81.4
22	50.2	64.7	80.5

Source: GAO analysis of 1992 to 2014 Health and Retirement Study data. | GAO-19-587

Notes: The proportion of individuals alive was estimated using a Kaplan-Meier survival analysis, with survival time measured from the respondent's first interview during the 1992 wave of the HRS at ages 51 to 61. We defined mid-career household earnings based on earnings reported to the Social Security Administration for years when the survey respondents were ages 41 through 50, as well the earnings of their spouses or partners during those years if the respondents were part of a couple in 1992. We ranked these households by their mid-career household earnings and broke them into five equally sized groups, or quintiles.

Appendix IV: Additional Survival Analysis Results

Table 13: Proportion of Those Ages 51 to 61 in 1992 Living to Ages 73 to 83 in 2014, By Race and Ethnicity

Years after initial interview	Proportion of individuals alive, by race and ethnicity		
	Hispanic, any race	White, non-Hispanic	Black, non-Hispanic
1	99.5	99.2	98.7
2	98.7	98.4	97.1
3	98.1	97.4	95.3
4	97.3	96.5	93.6
5	96.6	95.6	91.7
6	94.9	94.6	90.3
7	93.9	93.2	88.3
8	92.4	91.8	85.7
9	91.4	90.3	82.7
10	89.9	88.8	80.3
11	87.9	87.7	78.5
12	86.6	86.0	76.2
13	84.5	84.4	74.3
14	82.2	82.7	72.3
15	81.2	80.8	69.9
16	79.1	78.7	67.0
17	77.3	76.3	64.5
18	75.0	73.9	62.6
19	72.9	71.5	59.7
20	71.3	68.9	57.0
21	69.6	66.7	54.3
22	67.5	64.5	51.7

Source: GAO analysis of 1992 to 2014 Health and Retirement Study data. | GAO-19-587

Notes: The proportion of individuals alive was estimated using a Kaplan-Meier survival analysis, with survival time measured from the respondent's first interview during the 1992 wave of the HRS at ages 51 to 61. Estimates for "Other, non-Hispanic" were not reliable due to the small sample size.

Table 14: Proportion of Those Ages 51 to 61 in 1992 Living to Ages 73 to 83 in 2014, By Household Wealth in 1992

Years after initial interview	Proportion of individuals alive, by 1992 household wealth quintile				
	Bottom quintile	Second quintile	Third quintile	Fourth quintile	Top quintile
1	98.4	99.2	99.7	99.2	99.5
2	96.8	98.6	99.3	98.6	99.1
3	95.0	97.4	98.4	97.6	98.3
4	93.6	96.3	97.7	97.0	98.0

Appendix IV: Additional Survival Analysis Results

Years after initial interview	Proportion of individuals alive, by 1992 household wealth quintile				
	Bottom quintile	Second quintile	Third quintile	Fourth quintile	Top quintile
5	92.2	95.3	96.8	96.1	97.7
6	90.4	93.6	95.7	95.5	97.3
7	88.1	92.0	94.2	94.8	96.3
8	85.5	90.0	92.8	94.1	95.5
9	82.9	88.6	91.1	92.4	94.9
10	80.4	87.1	89.4	91.4	94.0
11	78.8	85.5	88.2	90.6	93.3
12	76.3	83.6	86.2	89.2	92.5
13	73.7	81.3	84.4	87.8	91.1
14	70.9	79.6	83.2	86.0	90.2
15	68.2	77.4	82.1	84.1	88.8
16	65.5	74.2	80.0	82.4	86.9
17	62.7	71.7	77.1	80.8	84.9
18	59.6	69.2	75.3	78.5	82.8
19	57.0	66.1	72.7	76.6	81.5
20	53.7	64.0	70.1	73.9	79.0
21	50.7	61.0	66.8	72.6	77.3
22	47.6	59.0	63.9	70.8	75.5

Source: GAO analysis of 1992 to 2014 Health and Retirement Study data. | GAO-19-587

Notes: The proportion of individuals alive was estimated using a Kaplan-Meier survival analysis, with survival time measured from the respondent's first interview during the 1992 wave of the HRS at ages 51 to 61. Wealth in 1992 is aggregated across all sources of net worth, such as retirement accounts, real estate, or investments, excluding second homes, which HRS did not consistently capture in all years. In addition, it does not include future income expected from Social Security or defined benefit pensions.

Table 15: Proportion of Those Ages 51 to 61 in 1992 Living to Ages 73 to 83 in 2014, By Education Level

Years after initial interview	Proportion of individuals alive, by education level				
	College degree or higher	Some college	High school diploma	GED	Less than high school
1	99.3	99.7	99.3	99.0	98.7
2	99.1	98.8	98.4	98.2	97.2
3	98.0	97.4	97.3	96.5	96.2
4	97.4	96.7	96.5	95.4	94.7
5	96.8	95.8	95.7	92.6	93.6
6	96.3	94.9	94.6	91.1	91.6
7	95.8	92.9	93.1	90.3	90.0

Appendix IV: Additional Survival Analysis Results

Years after initial interview	Proportion of individuals alive, by education level				
	College degree or higher	Some college	High school diploma	GED	Less than high school
8	94.4	91.7	92.0	89.5	87.1
9	93.0	90.4	90.2	88.7	84.9
10	92.2	89.2	88.6	85.8	82.7
11	91.3	88.4	87.3	85.0	80.7
12	90.0	87.0	85.8	82.8	78.3
13	88.9	85.1	84.0	80.3	76.6
14	87.5	82.9	82.7	79.4	74.1
15	86.1	81.4	80.8	76.8	71.8
16	84.7	79.7	78.7	74.0	68.4
17	82.8	77.4	76.3	71.9	65.6
18	80.6	75.0	74.8	69.5	62.2
19	79.8	72.9	72.3	67.4	58.3
20	78.4	70.1	69.7	63.6	55.7
21	76.8	68.2	67.4	61.3	52.6
22	74.9	65.6	65.3	57.3	50.6

Source: GAO analysis of 1992 to 2014 Health and Retirement Study data. | GAO-19-587

Notes: The proportion of individuals alive was estimated using a Kaplan-Meier survival analysis, with survival time measured from the respondent's first interview during the 1992 wave of the HRS at ages 51 to 61. "Some college" refers to individuals who had at least some college education but did not have a bachelor's degree. "Less than high school" refers to individuals who did not have a high school diploma or a GED.

Table 16: Proportion of Those Ages 51 to 61 in 1992 Living to Ages 73 to 83 in 2014, By Gender

Years after initial interview	Proportion of individuals alive, by gender	
	Female	Male
1	99.5	98.9
2	98.7	97.9
3	98.1	96.2
4	97.4	95.0
5	96.6	93.8
6	95.6	92.5
7	94.5	90.8
8	93.2	88.9
9	91.9	86.9
10	90.5	85.1
11	89.7	83.3

Appendix IV: Additional Survival Analysis Results

Years after initial interview	Proportion of individuals alive, by gender	
	Female	Male
12	88.4	81.2
13	87.0	79.3
14	85.4	77.3
15	84.0	75.0
16	81.7	72.8
17	79.6	70.1
18	77.3	67.8
19	75.0	65.3
20	72.7	62.6
21	70.6	60.2
22	68.6	57.8

Source: GAO analysis of 1992 to 2014 Health and Retirement Study data. | GAO-19-587

Notes: The proportion of individuals alive was estimated using a Kaplan-Meier survival analysis, with survival time measured from the respondent's first interview during the 1992 wave of the HRS at ages 51 to 61.

Table 17: Proportion of Those Ages 51 to 61 in 1992 Living to Ages 73 to 83 in 2014, By Self-Reported Health Status in 1992

Years after initial interview	Proportion of individuals alive, by self-reported health status in 1992				
	Excellent	Very good	Good	Fair	Poor
1	99.8	99.7	99.4	98.5	95.7
2	99.6	99.4	98.7	96.8	91.5
3	98.9	98.6	97.8	95.1	87.5
4	98.6	98.1	97.1	93.1	83.8
5	98.3	97.2	96.3	91.4	81.2
6	97.9	96.5	95.1	89.5	77.5
7	97.3	95.9	93.4	86.6	74.4
8	96.5	95.2	92.2	82.7	69.8
9	95.4	94.2	90.3	80.5	65.5
10	94.8	93.0	88.3	77.8	62.4
11	93.9	92.3	86.7	75.8	60.4
12	93.3	90.9	84.7	73.2	57.0
13	92.3	89.6	82.8	70.5	54.3
14	91.6	88.1	80.7	68.2	50.2
15	90.5	86.2	78.8	65.5	47.9
16	89.3	84.7	76.0	61.6	44.7
17	87.6	82.7	73.6	57.9	41.7

Appendix IV: Additional Survival Analysis Results

Years after initial interview	Proportion of individuals alive, by self-reported health status in 1992				
	Excellent	Very good	Good	Fair	Poor
18	85.5	80.8	71.1	54.7	39.3
19	84.1	78.8	68.2	51.2	36.4
20	81.7	76.2	65.9	48.6	34.1
21	80.0	74.3	62.7	45.5	32.9
22	77.9	72.6	60.1	42.8	30.8

Source: GAO analysis of 1992 to 2014 Health and Retirement Study data. | GAO-19-587

Notes: The proportion of individuals alive was estimated using a Kaplan-Meier survival analysis, with survival time measured from the respondent's first interview during the 1992 wave of the HRS at ages 51 to 61. Health is measured as respondent's self-reported health status in 1992.

Table 18: Estimated Hazard Ratios of Living to Ages 73 to 83 in 2014, for Those Ages 51 to 61 in 1992, By Mid-Career Household Earnings and Demographic Characteristics

Explanatory variables	Hazard ratios	95% confidence interval, lower bound	95% confidence interval, upper bound
Age at beginning of survey	1.079***	1.065	1.093
Household income (earnings) quintile			
1st quintile	1.733***	1.530	1.964
2nd quintile	1.520***	1.322	1.748
3rd quintile	1.277***	1.117	1.460
4th quintile	1.076	0.944	1.228
5th quintile (omitted category)	—	—	—
Race and ethnicity			
White, non-Hispanic	1.754***	1.494	2.058
Black, non-Hispanic	1.835***	1.535	2.194
Other, non-Hispanic	1.445*	0.989	2.112
Hispanic, any race (omitted category)	—	—	—
Education			
Less than high school	1.370***	1.161	1.617
GED	1.198*	0.991	1.448
High school diploma	1.191**	1.034	1.373
Some college	1.277***	1.088	1.499
College degree or higher (omitted category)	—	—	—
Gender			
Female	0.573***	0.527	0.623
Male (omitted category)	—	—	—
Self-reported health status at beginning of survey			

Appendix IV: Additional Survival Analysis Results

Explanatory variables	Hazard ratios	95% confidence interval, lower bound	95% confidence interval, upper bound
Poor	4.330***	3.776	4.967
Fair	2.825***	2.428	3.288
Good	1.855***	1.631	2.109
Very good	1.240***	1.075	1.431
Excellent (omitted category)	—	—	—
Number of observations	8,540		

Legend: *** = p<0.01; ** = p<0.05; * = p<0.1; and — = omitted category.

Source: GAO analysis of HRS data. | GAO-19-587

Notes: We used from data from the Health and Retirement Study from 1992 through 2014. Hazard ratios are estimated from a multivariate Cox proportional hazard model that accounted for the survey features of the data. The baseline respondent characteristics (omitted categories) are respondents in households in the top 20 percent of the household income (earnings) distribution, Hispanic respondents, respondents with college degrees or higher, male respondents, and respondents with excellent self-reported health upon entry into the HRS.

Table 19: Estimated Hazard Ratios of Living to Ages 73 to 83 in 2014, for Those Ages 51 to 61 in 1992, By Household Wealth in 1992 and Demographic Characteristics

Explanatory variables	Hazard ratios	95% confidence interval, lower bound	95% confidence interval, upper bound
Age at beginning of survey	1.088***	1.0739	1.103
Wealth quintile			
1st quintile	2.046***	1.788	2.343
2nd quintile	1.589***	1.371	1.841
3rd quintile	1.411***	1.233	1.614
4th quintile	1.175**	1.019	1.354
5th quintile (omitted category)	—	—	—
Race and ethnicity			
White, non-Hispanic	1.825***	1.572	2.117
Black, non-Hispanic	1.764***	1.484	2.097
Other, non-Hispanic	1.510**	1.022	2.230
Hispanic, any race (omitted category)	—	—	—
Education			
Less than high school	1.284***	1.098	1.501
GED	1.109	0.928	1.325
High school diploma	1.147**	1.001	1.314
Some college	1.259***	1.077	1.472
College degree or higher (omitted category)	—	—	—
Gender			
Female	0.604***	0.556	0.656

Appendix IV: Additional Survival Analysis Results

Explanatory variables	Hazard ratios	95% confidence interval, lower bound	95% confidence interval, upper bound
Male (omitted category)	—	—	—
Self-reported health status at beginning of survey			
Poor	4.048***	3.528	4.646
Fair	2.710***	2.317	3.171
Good	1.783***	1.563	2.035
Very good	1.214***	1.052	1.402
Excellent (omitted category)	—	—	—
Number of observations	8,540		

Legend: *** = p<0.01; ** = p<0.05; * = p<0.1; and — = omitted category.

Source: GAO analysis of HRS data. | GAO-19-587

Notes: We used from data from the Health and Retirement Study from 1992 through 2014. Hazard ratios are estimated from a multivariate Cox proportional hazard model that accounted for the survey features of the data. The baseline respondent characteristics (omitted categories) are respondents in households in the top 20 percent of the household wealth distribution, Hispanic respondents, respondents with college degrees or higher, male respondents, and respondents with excellent self-reported health upon entry into the HRS.

Appendix V: 2014 Population in the Health and Retirement Study (HRS)

This appendix compares the demographic characteristics, as of 2014, of the HRS sample we used in our analysis.

Table 20: Race and Ethnicity of Household Head by Mid-Career Earnings Quintile in 2014

	Race and ethnicity of household head	Percent of households	Lower bound 99% confidence interval	Upper bound 99% confidence interval
Bottom quintile	White, non-Hispanic	10.7	9.3	12.2
	Minority	4.8	3.6	6.0
Second quintile	White, non-Hispanic	12.6	10.9	14.3
	Minority	5.3	4.0	6.6
Third quintile	White, non-Hispanic	16.0	14.0	18.0
	Minority	4.0	3.2	5.0
Fourth quintile	White, non-Hispanic	20.1	18.1	22.2
	Minority	2.1	1.6	2.6
Top quintile	White, non-Hispanic	22.1	19.1	25.1
	Minority	2.1	1.4	2.8

Source: GAO analysis 1992 to 2014 Health and Retirement Study data. | GAO-19-587

Notes: For the purposes of this report, minority is defined as someone who is non-white or Hispanic, including those who are black or Asian, or Hispanic. These data were insufficient for breaking out race and ethnicity results from each other. We defined mid-career household earnings based on earnings reported to the Social Security Administration for years when the survey respondents were ages 41 through 50, as well the earnings of their spouses or partners during those years if the respondents were part of a couple in 1992. We conducted our analysis for households where the heads of household were born in 1931-1941; these individuals were ages 51 through 61 in 1992 and ages 73 through 83 in 2014. All amounts are presented in 2016 dollars. We examined medians but not means, due to distributional skew caused by outliers. The Health and Retirement Study is a longitudinal survey that collects information from the same households in their sample every 2 years.

Table 21: Education Level of Household Head by Mid-Career Earnings Quintile in 2014

	Education level of household head	Percent of households	Lower bound 99% confidence interval	Upper bound 99% confidence interval
Bottom quintile	At least some college	5.3	4.3	6.4
	No college	10.2	8.7	11.8
Second quintile	At least some college	5.6	4.4	6.7
	No college	12.3	10.8	13.8
Third quintile	At least some college	7.3	5.9	8.7
	No college	12.8	11.0	14.6
Fourth quintile	At least some college	9.6	8.3	10.8

Appendix V: 2014 Population in the Health and Retirement Study (HRS)

	Education level of household head	Percent of households	Lower bound 99% confidence interval	Upper bound 99% confidence interval
	No college	12.7	11.1	14.2
Top quintile	At least some college	15.7	13.2	18.2
	No college	8.5	7.4	9.5

Source: GAO analysis 1992 to 2014 Health and Retirement Study data. | GAO-19-587

Notes: "Some college" refers to those households where the head had at least some college education, and "No college" refers to those households where the head did not attend college. We defined mid-career household earnings based on earnings reported to the Social Security Administration for years when the survey respondents were ages 41 through 50, as well the earnings of their spouses or partners during those years if the respondents were part of a couple in 1992. We conducted our analysis for households where the heads of household were born in 1931-1941; these individuals were ages 51 through 61 in 1992 and ages 73 through 83 in 2014. All amounts are presented in 2016 dollars. We examined medians but not means, due to distributional skew caused by outliers. The Health and Retirement Study is a longitudinal survey that collects information from the same households in their sample every 2 years.

Table 22: Household Type by Mid-Career Earnings Quintile in 2014

	Household type	Percent of households	Lower bound 99% confidence interval	Upper bound 99% confidence interval
Bottom quintile	Coupled	3.5	2.5	4.5
	Single men	2.3	1.6	3.0
	Single women	9.8	8.4	11.2
Second quintile	Coupled	5.4	4.4	6.5
	Single men	3.3	2.5	4.1
	Single women	9.1	7.8	10.5
Third quintile	Coupled	8.5	7.2	9.8
	Single men	3.3	2.4	4.3
	Single women	8.3	7.2	9.4
Fourth quintile	Coupled	12.5	11.2	13.7
	Single men	3.7	2.7	4.6
	Single women	6.1	5.1	7.1
Top quintile	Coupled	15.7	13.3	18.2
	Single men	2.3	1.5	3.0
	Single women	6.2	5.2	7.2

Source: GAO analysis 1992 to 2014 Health and Retirement Study data. | GAO-19-587

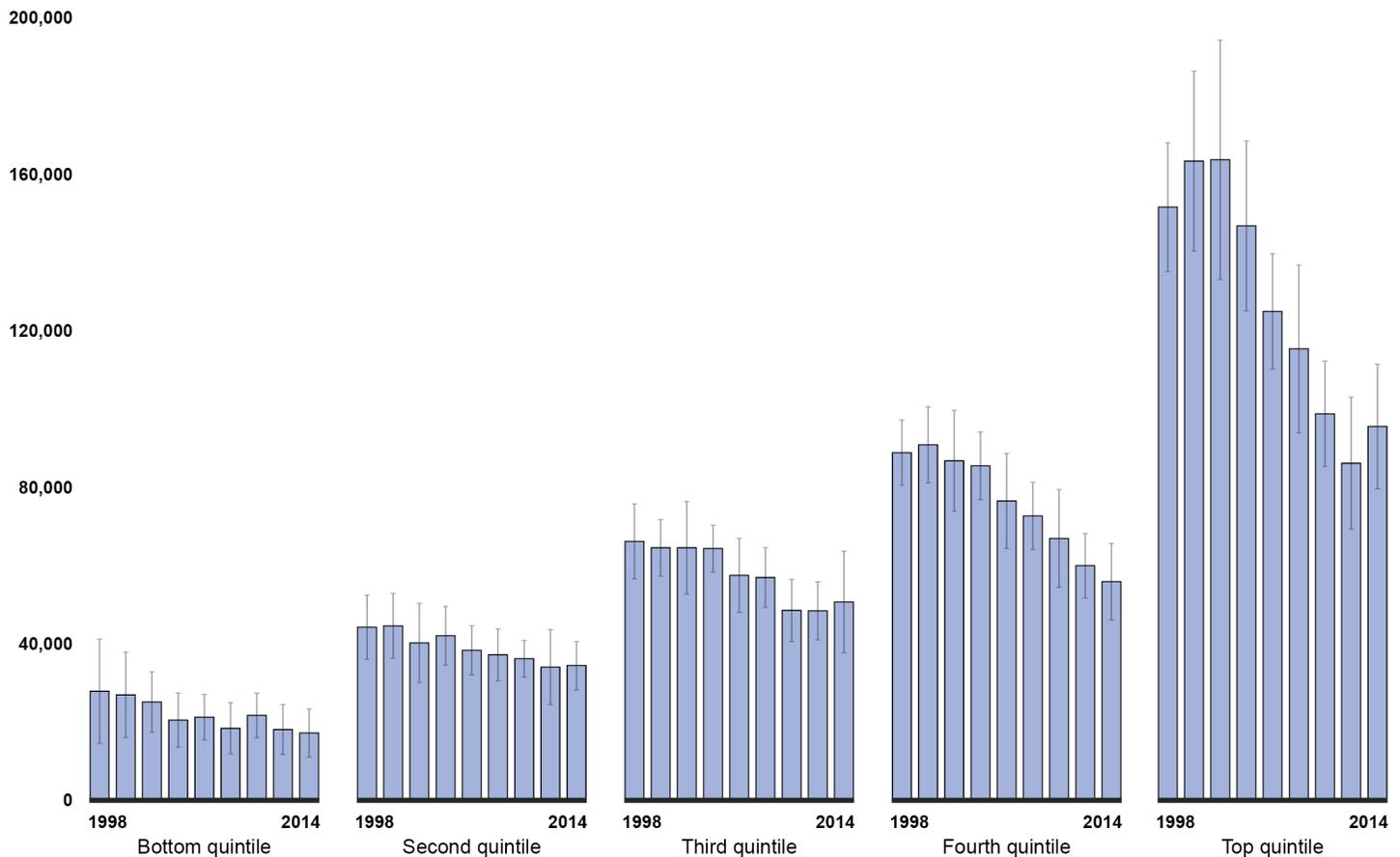
Notes: We defined mid-career household earnings based on earnings reported to the Social Security Administration for years when the survey respondents were ages 41 through 50, as well the earnings of their spouses or partners during those years if the respondents were part of a couple in 1992. We conducted our analysis for households where the heads of household were born in 1931-1941; these individuals were ages 51 through 61 in 1992 and ages 73 through 83 in 2014. All amounts are presented in 2016 dollars. We examined medians but not means, due to distributional skew caused by outliers. The Health and Retirement Study is a longitudinal survey that collects information from the same households in their sample every 2 years.

Appendix VI: Estimated Income and Wealth for War Babies Cohort

This appendix contains estimates of income and wealth for households, where the heads of households were born from 1942 through 1947. The Health and Retirement Study (HRS) refers to this cohort as the “War Babies” cohort.

Figure 18: Estimated Median Household Income for Individuals Born in 1942-1947 and Their Spouses or Partners, As They Aged by Mid-Career Earnings Level

Median household income (in 2016 dollars)

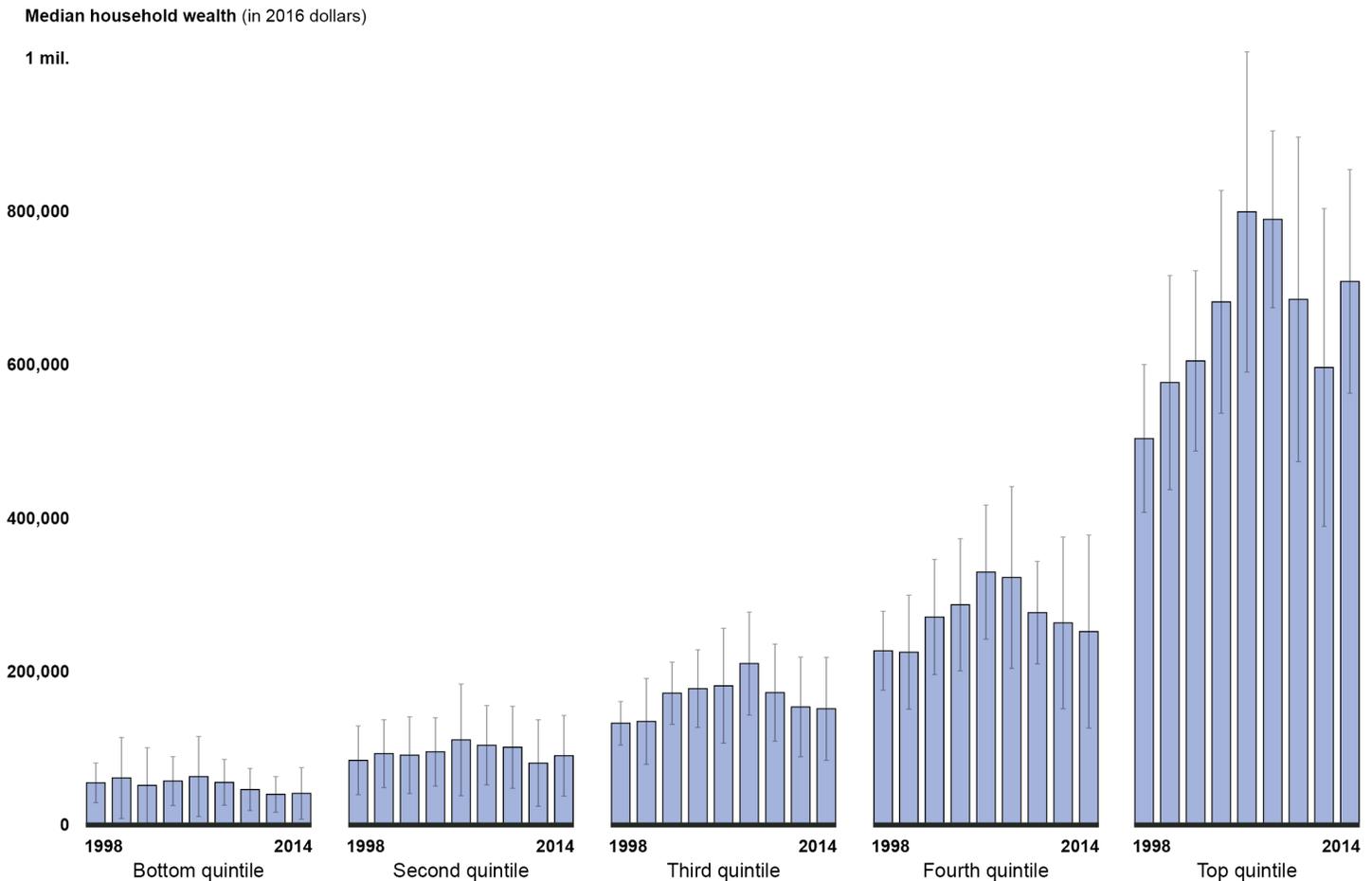


Source: GAO analysis of 1992 through 2014 Health and Retirement Study data. | GAO-19-587

Notes: Income figures are estimates aggregated across all potential sources, such as wages, Social Security benefits, or pensions; the lines overlapping the bars represent 99 percent confidence intervals. We ranked households by their mid-career earnings and broke them into five equally sized groups, or quintiles. We defined mid-career household earnings based on earnings reported to the Social Security Administration for years when the survey respondents were ages 41 through 50, as well the earnings of their spouses or partners during those years if the respondents were part of a couple in 1992. We conducted our analysis for households where the heads of household were born in 1942-1947; these individuals were ages 51 through 56 in 1998 and ages 67 through 72 in 2014. The Health and Retirement Study refers to this cohort as the “War Babies” cohort. All amounts are presented in 2016 dollars. We examined the median amount for each year but not the means, due to

distributional skew caused by outliers. The Health and Retirement Study is a longitudinal survey that collects information from the same households in their sample every 2 years.

Figure 19: Estimated Median Household Wealth for Individuals Born in 1942-1947 and Their Spouses or Partners, As They Aged, by Mid-Career Earnings Level



Source: GAO analysis of 1992 through 2014 Health and Retirement Study data. | GAO-19-587

Notes: For this analysis, we defined wealth as net worth. This definition includes nonfinancial assets, such as home equity and the value of vehicles, in addition to financial assets. It does not include future income expected from Social Security or defined benefit pensions. Wealth figures are estimates; the lines overlapping the bars represent 99 percent confidence intervals. We ranked households by their mid-career earnings and broke them into five equally sized groups, or quintiles. We defined mid-career household earnings based on earnings reported to the Social Security Administration for years when the survey respondents were ages 41 through 50, as well the earnings of their spouses or partners during those years if the respondents were part of a couple in 1992. We conducted our analysis for households where the heads of household were born in 1942-1947; these individuals were ages 51 through 56 in 1998 and ages 67 through 72 in 2014. The Health and Retirement Study refers to this cohort as the “War Babies” cohort. All amounts are presented in 2016 dollars. We examined the median amount for each year but not the means, due to distributional skew

**Appendix VI: Estimated Income and Wealth for
War Babies Cohort**

caused by outliers. The Health and Retirement Study is a longitudinal survey that collects information from the same households in their sample every 2 years.

Appendix VII: GAO Contact and Staff Acknowledgments

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Staff Acknowledgments

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