



March 2016

RETIREMENT SECURITY

Better Information on Income Replacement Rates Needed to Help Workers Plan for Retirement

GAO Highlights

Highlights of [GAO-16-242](#), a report to congressional requesters

Why GAO Did This Study

Part of DOL's mission is to promote the retirement security of America's workers, a goal that has become increasingly challenging. One tool for assessing the adequacy of retirement income is the replacement rate. However, recommendations for the replacement rate that a household should target vary widely, in part because of the diverse underlying assumptions used to develop the rates. GAO was asked to review what consumption in retirement looks like and how target replacement rates are developed.

GAO examined (1) whether and how spending patterns vary by age, (2) key factors used to develop target replacement rates, and (3) the usefulness of information on such rates provided by DOL. GAO analyzed data from the BLS's 2013 Consumer Expenditure Survey, the most recent available; analyzed 59 articles and reports that discussed how to develop, calculate, or evaluate replacement rates; collected non-generalizable information from 14 retirement services firms and financial planners recommended by researchers and actuaries who have studied replacement rates; and reviewed DOL materials and interviewed officials.

What GAO Recommends

GAO recommends that DOL provide additional examples and guidance on using a replacement rate for estimating retirement savings needs in its planning tools, and modify the planning tools so the rate can be adjusted. DOL generally agreed with our recommendations and plans to add information and provide options for adjusting replacement rates in its planning tools by June 2017.

View [GAO-16-242](#). For more information, contact Charles A. Jeszeck at (202) 512-7215 or jeszeck@gao.gov.

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What GAO Found

Household spending patterns varied by age, with mid-career households (those aged 45-49) spending more than older households. For example, according to 2013 survey data from the Bureau of Labor Statistics (BLS), mid-career households spent an estimated average of around \$58,500, while young retiree households (those aged 65-69) spent about 20 percent less. While the share of spending was consistent for some categories, other categories had larger variations across age groups. For example, housing expenses comprised the largest share of spending regardless of age, while older households spent more out of pocket on health care than mid-career households. Spending was less variable across age for low-income households compared to other households. For example, there was not a significant difference in average spending between mid-career and young retiree households in the lowest income quartile, compared to an approximately \$20,000 difference for the highest income quartile. These variations in spending patterns have implications for the resources households need to maintain their standard of living in retirement.

Researchers and financial industry professionals develop target replacement rates—the percentage of income to aim for in retirement—based on certain key factors, including spending, household characteristics, and pre-retirement earnings. GAO's analysis of the literature found that calculating an appropriate replacement rate can be complex. For example, there is debate over whether households that have raised children should target a lower replacement rate than households that have not. In addition, a worker's pre-retirement earnings could be defined as earnings at the end of the worker's career or as average earnings over the course of the career. Despite these complicated considerations, target replacement rates cited in the articles and reports GAO reviewed typically range between 70 and 85 percent. Some financial industry professionals told GAO that they develop customized targets that take into account workers' assets and expected spending, while others questioned the usefulness of replacement rates.

The information and tools on replacement rates that the Department of Labor (DOL) provides may be too limited to help workers understand how to use such rates for retirement planning. DOL's Employee Benefits Security Administration's (EBSA) website provides information and tools to help American workers better plan for retirement, including a tool to help workers calculate their retirement income needs as a percentage of preretirement income. While EBSA's materials note that a target replacement rate can vary based on individual circumstances, they do not include specific examples of demographic groups that research indicates can result in higher or lower income replacement needs, or how much a replacement rate might need to be adjusted for those groups or for other individual circumstances. Without additional information, workers may not understand how to adjust target replacement rates when planning for retirement. Further, EBSA's worksheet and online tool for calculating how much to save use a default replacement rate with no opportunity for a user to adjust the rate based on individual circumstances. Without the ability to adjust the replacement rates used in planning tools, workers may over- or under-estimate how much they need to save for retirement.

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Abbreviations

BLS	Bureau of Labor Statistics
CE	Consumer Expenditure Survey
CFPB	Consumer Financial Protection Bureau
DOL	Department of Labor
EBSA	Employee Benefits Security Administration
ERISA	Employee Retirement Income Security Act of 1974
IRA	Individual Retirement Account
LTC	Long-term care
NRRI	National Retirement Risk Index
RRR	Retirement readiness rating
SSA	Social Security Administration

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March 1, 2016

The Honorable Patty Murray
Ranking Member
Committee on Health, Education, Labor and Pensions
United States Senate

The Honorable Robert C. “Bobby” Scott
Ranking Member
Committee on Education and the Workforce
House of Representatives

Whether older Americans will have adequate income in retirement has been a longstanding concern for several reasons including the decline in defined benefit pensions, the growing responsibility for individuals to save for retirement through employer-sponsored defined contribution plans or on their own, and the financial challenges facing Social Security.¹ To better predict how much income Americans will need once they leave the workforce, many researchers use target replacement rates—the percentage of pre-retirement income needed to maintain a certain standard of living in retirement. In recent years, numerous studies on the replacement rates that households should target have not resulted in a consensus recommendation, in part because estimates are heavily dependent on the underlying assumptions used to develop them. To accurately interpret the implications for retirement adequacy it is important for policy makers and individuals to better understand how these targets are developed.

You asked us to review what consumption looks like in retirement and how replacement rates are defined, calculated, and used to assess retirement preparedness. This report assesses (1) whether and how spending patterns vary by age, (2) key factors used to develop target

¹ Defined benefit plans are “traditional” employer-sponsored pension plans that offer benefits typically determined by a formula based on factors specified by the plan, such as salary and years of service. Defined benefit plans typically pay lifetime annuity benefits in retirement, although some plans also offer a lump-sum distribution option. In contrast, in defined contribution plans, workers accumulate savings over their careers and manage withdrawals in retirement.

replacement rates, and (3) the usefulness of information on retirement replacement rates provided to workers by the Department of Labor.

To assess whether spending patterns vary across working and retired households, we used 2013 expenditure data from the Bureau of Labor Statistics' Consumer Expenditure Survey (CE). This was the most recently available data at the time of our review. The CE is a sample survey designed to be representative of the total U.S. noninstitutionalized civilian population and is used to collect data on consumers' characteristics and buying habits. We conducted a cross-sectional analysis to see how spending patterns vary across different age groups. We also conducted a regression analysis to understand how the effects of age vary by spending category, such as health care and housing, and household income level. To ensure the variables we analyzed in the 2013 CE data were reliable for our purposes, we reviewed survey documentation, compared results to published tables, and interviewed agency officials. Based on this, we found the data to be reliable for the purposes used in this report.

To understand the various factors considered when developing a target replacement rate, we conducted a literature search from January 2015 through January 2016, which generated a total of 630 results. We reviewed abstracts, when available, to identify which articles (1) contained information on target replacement rates or assumptions needed to calculate a replacement rate and (2) were published in or after 2005 in academic journals or by research centers or international organizations. We determined 59 articles and reports met these criteria and included them in our analysis. In addition, we used a questionnaire—coupled with interviews—to assess whether financial firms use target replacement rates and, if they do, what factors financial industry professionals considered when developing these targets. To determine which firms to contact, we relied on suggestions from several researchers and actuaries who have studied replacement rates. In total, we collected information from 14 firms—7 service providers, 3 retirement services consulting firms, and 4 financial planners. While these firms provided valuable insight into target replacement rate recommendations, our findings are not generalizable to the full population of service providers, retirement consulting firms, and financial planners. To identify the range of target replacement rates recommended to U.S. workers, we catalogued references to such recommendations in the studies we selected for review. Our analysis focused on total replacement rates—the ratio of all income in retirement (including Social Security, pension benefits, and retirement savings) to pre-retirement earnings. We sought

to identify a number of considerations that researchers, policy makers, and financial professionals incorporate into their assumptions when developing, calculating, or evaluating target replacement rates. However, because analyzing the merits and disadvantages of each consideration was outside the scope of our work, we are not endorsing any of the considerations presented in this report.

To assess the usefulness of the information on replacement rates provided to workers by the Department of Labor (DOL), we reviewed relevant retirement planning materials produced by the agency and we interviewed agency officials. Lastly, we reviewed relevant federal laws and regulations. Although we found references to replacement rates in Social Security Administration (SSA) and Consumer Financial Protection Bureau documents, we focused our review on DOL materials as DOL is required by law to provide a means of calculating retirement savings needs using a replacement rate.² For more information on our objectives, scope, and methodology, please see appendix I and the bibliography at the end of this report.

We conducted this performance audit from January 2015 to March 2016 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

Some key sources of retirement income are Social Security benefits,³ defined benefit plans, defined contribution plans, Individual Retirement Accounts (IRAs), as well as personal savings. In recent years, employment-based retirement plan coverage, especially in the private sector, has shifted from defined benefit to defined contribution plans. Under “traditional” defined benefit plans, workers typically receive benefits—based on factors such as salary and years of service—in the

² See 29 U.S.C. § 1146(d).

³ Social Security benefits are progressive. That is, Social Security provides disproportionately higher benefits, as a percentage of earnings, to lower earners than to higher earners.

form of a lifetime annuity that provides a guaranteed monthly payment. Defined benefit plans are, in most cases, financed by employers, who are responsible for managing plan assets. Defined contribution plans and IRAs are two primary types of retirement savings vehicles in which benefits accrue in the form of account balances, which grow from contributions made by workers (and sometimes by their employers) and investment returns. Workers and employers who contribute to retirement savings accounts generally receive favorable federal tax treatment, such as tax deductions for contributions and tax-deferred or even tax-free returns on investment. In addition to tax advantages, defined contribution plans and IRAs provide portability of savings and transparency of known account balances.⁴ However, they also place the primary responsibility on individuals to participate in, contribute to, and manage their accounts throughout their working careers. Moreover, individuals must manage their savings throughout retirement, including deciding whether and how to convert an account balance into an income stream, in order to avoid running out of money.⁵

This shift in responsibility is further compounded by the low levels of financial literacy in the United States. As we have previously reported, numerous studies have found that many Americans lack basic financial literacy, including an understanding of fundamental investment concepts, such as the benefits of compounding interest and risk diversification and the potential impact of inflation. We concluded that such basic financial literacy is necessary for making well-informed decisions and evaluating

⁴ However, we have previously reported on a number of issues that limit portability and transparency for individuals. For instance, we found that participants may find the process of rolling over defined contribution plan balances confusing and administratively burdensome. See GAO, *401(k) Plans: Labor and IRS Could Improve the Rollover Process for Participants*, [GAO-13-30](#) (Washington, D.C.: Mar. 7, 2013). In addition, we have reported that participants may be unaware of the fees they are paying due to shortcomings in participant fee disclosures. See GAO, *Defined Contribution Plans: Approaches in Other Countries Offer Beneficial Strategies in Several Areas*, [GAO-12-328](#) (Washington, D.C.: Mar. 22, 2012). For a complete list of GAO reports related to this study, please see the Related GAO Products page at the end of this report.

⁵ We have previously reported on challenges and issues related to individuals managing their income during retirement. For more information on these issues, see GAO, *401(k) Plans: Other Countries' Experiences Offer Lessons in Policies and Oversight of Spend-down Options*, [GAO-14-9](#) (Washington, D.C.: Nov. 20, 2013) and *Retirement Income: Ensuring Income throughout Retirement Requires Difficult Choices*, [GAO-11-400](#) (Washington, D.C.: June 7, 2011).

recommendations.⁶ Financial literacy research has also pointed to the need to educate individuals to improve their investment decision-making and savings outcomes.⁷ For example, one study found that a large percentage of American workers has not conducted meaningful retirement planning, even when retirement is in the near future.⁸ Another study found that most workers acknowledge they do not know as much as they should about retirement planning and that many workers actually guessed at their retirement savings needs.⁹ Further, our past work has found that ensuring income in retirement requires workers to make difficult choices and that workers may not have sufficient information to determine which choices are in their best interest.¹⁰

Many studies have evaluated the retirement readiness of workers and the economic well-being of retirees. These studies have used a variety of benchmarks for assessing retirement readiness or well-being, including assorted measures of retirement saving, income, consumption, wealth, and standard of living.¹¹ Economists broadly agree that a conceptual benchmark measure for adequate retirement saving is an amount that will, along with other sources of retirement income, allow a household to maintain its pre-retirement standard of living into retirement. A key

⁶ [GAO-13-30](#); *Financial Literacy: Enhancing the Effectiveness of the Federal Government's Role*, [GAO-12-636T](#) (Washington, D.C.: Apr. 26, 2012); [GAO-11-400](#); and *GAO, 401(k) Plans: Improved Regulation Could Better Protect Participants from Conflicts of Interest*, [GAO-11-119](#) (Washington, D.C.: Jan. 28, 2011).

⁷ See, Annamaria Lusardi and Olivia S. Mitchell, "The Economic Importance of Financial Literacy: Theory and Evidence," *Journal of Economic Literature*, vol. 52, issue 1 (2014); FINRA Investor Education Foundation, *Financial Capability in the United States* (May 2013); "Bridging the Gap Between Employers' and Workers' Understanding of 401(k) Fees," Transamerica Center for Retirement Studies (July 2010); Angela A. Hung, et al., "Building Up, Spending Down: Financial Literacy, Retirement Savings Management, and Decumulation," *RAND Working Paper 712* (2009); Annamaria Lusardi, "Household Saving Behavior: The Role of Financial Literacy, Information, and Financial Education Programs," *National Bureau of Economic Research Working Paper no. 13824* (February 2008).

⁸ Lusardi (2008).

⁹ Transamerica (2010).

¹⁰ For more information, see [GAO-11-400](#).

¹¹ For more information see GAO, *Retirement Security: Most Households Approaching Retirement Have Low Savings*, [GAO-15-419](#) (Washington, D.C.: May 12, 2015).

concept underlying such a measure is the lifecycle model of savings, which suggests that individuals will adjust their saving and spending to ensure a consistent level of consumption over their lifetime.¹²

Income replacement rates, measured as a percentage of pre-retirement income, are one common method for analyzing the retirement readiness of individuals and providing information to help individual workers plan for retirement.¹³ Plan sponsors and researchers have long used them to assess the adequacy of pension plan benefit levels. Replacement rates can also show the extent to which individuals are able to replace their pre-retirement earnings with other sources of income in retirement, such as Social Security benefits, pension benefits, or retirement savings. While there is no consensus about how much income is required to ensure a stable standard of living, economists and financial planners generally agree that many retirees do not need to replace 100 percent of their pre-retirement income to maintain their standard of living because most retirees probably have reduced expenses relative to when they were working. For example, spending on transportation may be reduced for those who no longer need to commute to work. As a benchmark of how much income will be needed in retirement, a target replacement rate can help alert workers about how much to save as well as how long to work or how much to spend. However, while a replacement rate provides an individual with important information for developing a long-term savings goal, it does not provide a plan for achieving it. Converting a target replacement rate to a savings plan—such as how much to set aside from each paycheck—over a number of years is a complicated exercise and may prove daunting, especially in light of the limited financial literacy of many Americans.

DOL is responsible for providing guidance on retirement income savings for workers. The Employee Retirement Income Security Act of 1974, as amended (ERISA), directs the Secretary of Labor to “maintain an ongoing

¹² A lifecycle model of saving in economics tries to explain patterns of consumption and saving over an individual or household’s lifetime. The model generally predicts that individuals seek to smooth consumption over their lives, leading to a prediction of borrowing during younger years, saving during middle-age years, and living off accumulated savings in retirement. However, because consumption is difficult to measure income is frequently used as a proxy.

¹³ For other measures of retirement adequacy see [GAO-15-419](#).

program of outreach to the public designed to effectively promote retirement income savings by the public.” With regard to replacement rates specifically, ERISA also directs the Secretary of Labor to establish a website that includes a “means for individuals to calculate their estimated retirement savings needs, based on their retirement income goal as a percentage of their preretirement income.”¹⁴

Mid-Career Households Spent More than Older Households, and Spending Patterns Varied by Expenditure and Income Level

Older Households Spent about 20 Percent Less than Mid-Career Households in 2013

Based on our analysis of 2013 CE data, mid-career households had one of the highest spending levels, while older households generally spent less.¹⁵ More specifically, in 2013, mid-career households—those aged 45-49—spent an estimated average of about \$58,500, while young retiree households—those aged 65-69— spent about \$46,800, or 20 percent

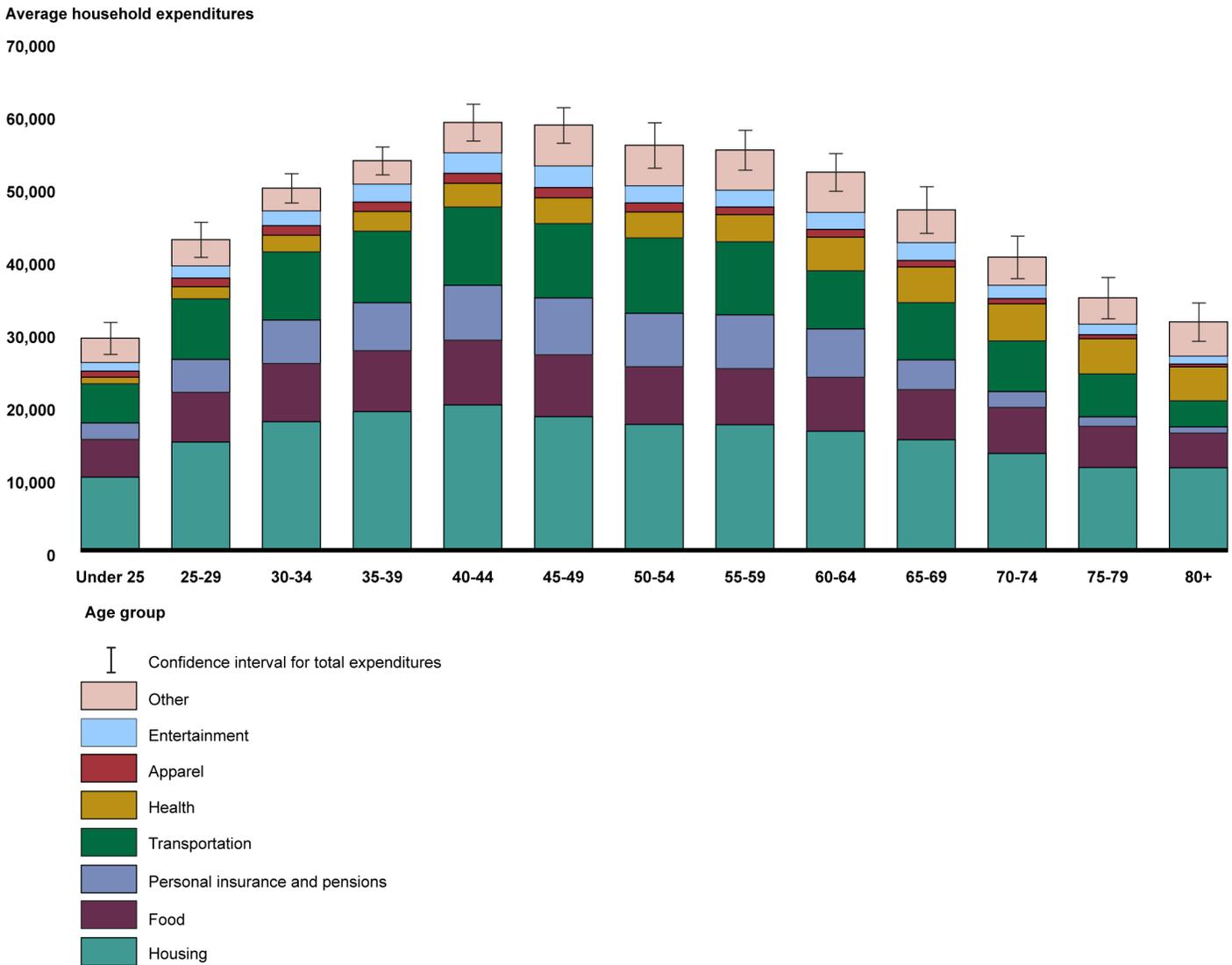
¹⁴ 29 U.S.C. § 1146.

¹⁵We analyzed the 2013 CE data, which was the most current version of the survey at the time of our analysis. The unit of analysis in the CE is consumer units that comprise (1) all members of a household related by blood, marriage, or other legal arrangement, (2) a person living alone or sharing a household but who is financially independent, or (3) two or more persons living together who make joint expenditures. For the purposes of this report, we refer to consumer units as households and we define spending as direct out-of-pocket expenditures. The 95 percent confidence intervals for average total spending are between \$56,014 and \$60,890 for mid-career households (aged 45-49) and between \$43,586 and \$49,996 for young retiree households (aged 65-69). The 95 percent confidence interval for the difference in spending levels between the two groups is between \$7,634 and \$15,688. For exact estimates and additional information on the confidence intervals, see appendix III.

less overall (see fig. 1).¹⁶ We also analyzed spending across two broader age groups: pre-retirement households (aged 50-64) and post-retirement households (65-79) (see table 1). We found that the difference in spending between broader age groups was similar to the comparison between mid-career and young retiree households using 5-year age groups. The estimated average total spending for post-retirement households was about 77 percent of the spending levels for pre-retirement households.

¹⁶For ease of presentation in this report, we used various age groups as proxies to represent different stages of working and retired life for points of comparison. Similar to other literature analyzing retirement consumption, we use age 65 as a representation of retirement age. Accordingly, we selected 5-year age groupings based on their relation to this retirement age. For example, we used households aged 45-49, who are near the middle of the age group range and younger than retirement age, as a representation of the mid-career stage. We also chose three different age groups as points of comparison for various stages of retirement: young retirees are represented by households aged 65-69, those closest to retirement age; mid-retirees by households 75-79, who are several years older than retirement age; and older retirees by the oldest households, those aged 80 and older. However, actual career and retirement status by age would depend on individual household circumstances and is not known based on their age grouping. For example, some households in the “young retiree” group may not yet be retired, and some households younger than 65 could be retired.

Figure 1: Estimated Average Annual Household Expenditures by Age, 2013



Source: GAO analysis of 2013 Bureau of Labor Statistics Consumer Expenditure Survey, Interview Survey data. | GAO-16-242

Notes: Age groupings are based on the age of the reference person, or the person who rents or owns the home, for the consumer unit. There may be adults in the in the consumer unit who are older or younger than the reference person. A consumer unit can comprise (1) all members of a household related by blood, marriage, or other legal arrangement, (2) a person living alone or sharing a household but who is financially independent, or (3) two or more persons living together who make joint expenditures. For the purposes of this report, we refer to consumer units as households. We did not adjust spending levels for household size. The "other" category of spending includes expenditures for reading, tobacco, alcoholic beverages, education, cash contributions, personal care, and miscellaneous expenses. The "personal insurance and pensions category" includes deductions for government and railroad retirement, private pensions, and Social Security. According to Bureau of Labor Statistics officials, the private pensions category includes defined benefit, defined contribution,

and individual retirement accounts. Housing expenditures include expenses such as rent, utilities, and mortgage interest payments, but do not include payments on mortgage principal. For more information on mortgage principal, see appendix II. For more information on Consumer Expenditure Survey expenditure categories and treatment of taxes, see appendix I. For average total spending, 95 percent confidence intervals are less than +/-9 percent of the estimate itself for all age groups.

Table 1: Estimated Average Annual Household Expenditures across Pre- and Post-Retirement Age Groups, 2013

<i>Average annual household expenditures (rounded to nearest \$100)</i>		
Expenditure type	Pre-retirement (50-64)	Post-retirement (65-79)
Housing	\$17,000	\$13,700
Transportation	\$9,600	\$7,100
Food	\$7,700	\$6,400
Personal insurance and pensions	\$7,200	\$2,800
Health	\$3,900	\$5,000
Entertainment	\$2,300	\$2,000
Apparel	\$1,100	\$800
Other	\$5,600	\$4,100
Total	\$54,400	\$41,900

Source: GAO analysis of 2013 Bureau of Labor Statistics Consumer Expenditure Survey, Interview Survey data. | GAO-16-242

Notes: Age groupings are based on the age of the reference person, or the person who rents or owns the home, for the consumer unit. There may be adults in the consumer unit who are older or younger than the reference person. Similar to other literature analyzing retirement consumption, we use age 65 as a representation of retirement age. For ease of comparison purposes, we used broad age groups in this table to represent pre- and post-retirement age households. However, actual career and retirement status would depend on individual household circumstances and would not be known based on their age grouping. A consumer unit can comprise (1) all members of a household related by blood, marriage, or other legal arrangement, (2) a person living alone or sharing a household but who is financially independent, or (3) two or more persons living together who make joint expenditures. For the purposes of this report, we refer to consumer units as households. We did not adjust spending levels for household size. The "other" category of spending includes expenditures for reading, tobacco, alcoholic beverages, education, cash contributions, personal care, and miscellaneous expenses. The "personal insurance and pensions" category includes deductions for government and railroad retirement, private pensions, and Social Security. According to Bureau of Labor Statistics officials, the private pensions category includes defined benefit, defined contribution, and individual retirement accounts. Housing expenditures include expenses such as rent, utilities, and mortgage interest payments, but do not include payments on mortgage principal. For more information on mortgage principal, see appendix II. For more information on Consumer Expenditure Survey expenditure categories and treatment of taxes, see appendix I. Numbers may not add to column totals due to rounding. Ratios comparing spending levels between these two age groups are based on our unrounded estimates and are presented in appendix III. For average total expenditures in the table, 95 percent confidence intervals are less than +/- 6 percent of the estimate itself. Some expenditure categories may have larger variance. For exact estimates and additional information on the confidence intervals for the estimates in this table, see appendix III.

Spending was lower among mid-retiree and older retiree households compared to mid-career and young retiree households (see table 2). For example, mid-retiree households (aged 75-79) spent an average of around \$34,700, or 26 percent less, than young retiree households.¹⁷ Average spending for older retiree households (aged 80 and older) was slightly less than mid-retiree households at around \$31,400, although differences were not statistically significant.¹⁸

Table 2: Estimated Average Annual Household Expenditures for Select Age Groups, 2013

<i>Average annual household expenditures (rounded to nearest \$100)</i>				
Expenditure type	Mid-career (45-49)	Young retirees (65-69)	Mid-retirees (75-79)	Older retirees (80+)
Housing	\$18,400	\$15,200	\$11,400	\$11,300
Transportation	\$10,200	\$7,900	\$5,900	\$3,600
Food	\$8,500	\$6,900	\$5,600	\$4,800
Personal insurance and pensions	\$7,800	\$4,100	\$1,300	\$900
Health	\$3,500	\$4,900	\$4,800	\$4,700
Entertainment	\$3,000	\$2,400	\$1,400	\$1,100
Apparel	\$1,400	\$900	\$500	\$400
Other	\$5,600	\$4,500	\$3,600	\$4,700
Total	\$58,500	\$46,800	\$34,700	\$31,400

Source: GAO analysis of 2013 Bureau of Labor Statistics Consumer Expenditure Survey, Interview Survey data. | GAO-16-242

Notes: Age groupings are based on the age of the reference person, or the person who rents or owns the home, for the consumer unit. There may be adults in the consumer unit who are older or younger than the reference person. Similar to other literature analyzing retirement consumption, we use age 65 as a representation of retirement age. For ease of comparison purposes, we use age groups to represent various stages of working and retired life based on their relation to this retirement age. However, actual career and retirement status would depend on individual household circumstances and would not be known based on their age grouping. A consumer unit can comprise (1) all members of a household related by blood, marriage, or other legal arrangement, (2) a person living alone or sharing a household but who is financially independent, or (3) two or more persons living together who make joint expenditures. For the purposes of this report, we refer to consumer units as households. We did not adjust spending levels for household size. The “other” category of spending includes expenditures for reading, tobacco, alcoholic beverages, education, cash contributions, personal care, and miscellaneous expenses. The “personal insurance and pensions” category

¹⁷The 95 percent confidence interval for the difference between average spending levels for mid-retiree households (aged 75-79) and young retiree households (aged 65-69) is between \$7,823 and \$16,369.

¹⁸The 95 percent confidence intervals for average total spending are between \$31,868 and \$37,522 for mid-retiree households (aged 75-79) and between \$28,767 and \$34,022 for older retiree households (aged 80 and older).

includes deductions for government and railroad retirement, private pensions, and Social Security. According to Bureau of Labor Statistics officials, the private pensions category includes defined benefit, defined contribution, and individual retirement accounts. Housing expenditures include expenses such as rent, utilities, and mortgage interest payments, but do not include payments on mortgage principal. For more information on mortgage principal, see appendix II. For more information on Consumer Expenditure Survey expenditure categories and treatment of taxes, see appendix I. Numbers may not add to column totals due to rounding. For average total expenditures in the table, 95 percent confidence intervals are less than +/- 9 percent of the estimate itself. Some expenditure categories may have larger variance. For exact estimates, shares of total spending, and additional information on the confidence intervals for the estimates in this table, see appendix III.

The patterns in total spending may, in part, reflect variations in average household size and priorities. The average household size for mid-career households was about 2.9 people as compared to about 2.1 people for young retiree households. The average household size was approximately 1.7 people for mid-retirees and 1.5 people for older retirees. Patterns in spending may also be affected by the age composition of other members of the household. Lower spending for older households could also be indicative of different priorities. For example, one large relative difference in spending was attributable to the personal insurance and pensions category.¹⁹ Mid-career households may be more concerned with contributions toward retirement resources than older households who could already be retired. Moreover, we found that in 2013, age groups varied in how much they spent, including on basic needs, such as food, and non-essential items, such as entertainment. Such fluctuations in spending have implications for the resources households will need to maintain their standard of living. More specifically, spending levels are indicative of how households allocate resources based in part on different needs and lifestyle preferences, and are an important consideration when planning for retirement.

¹⁹ The “personal insurance and pensions” category includes deductions for private pensions, which are paycheck contributions to any type of employer sponsored retirement plan or to individual retirement accounts.

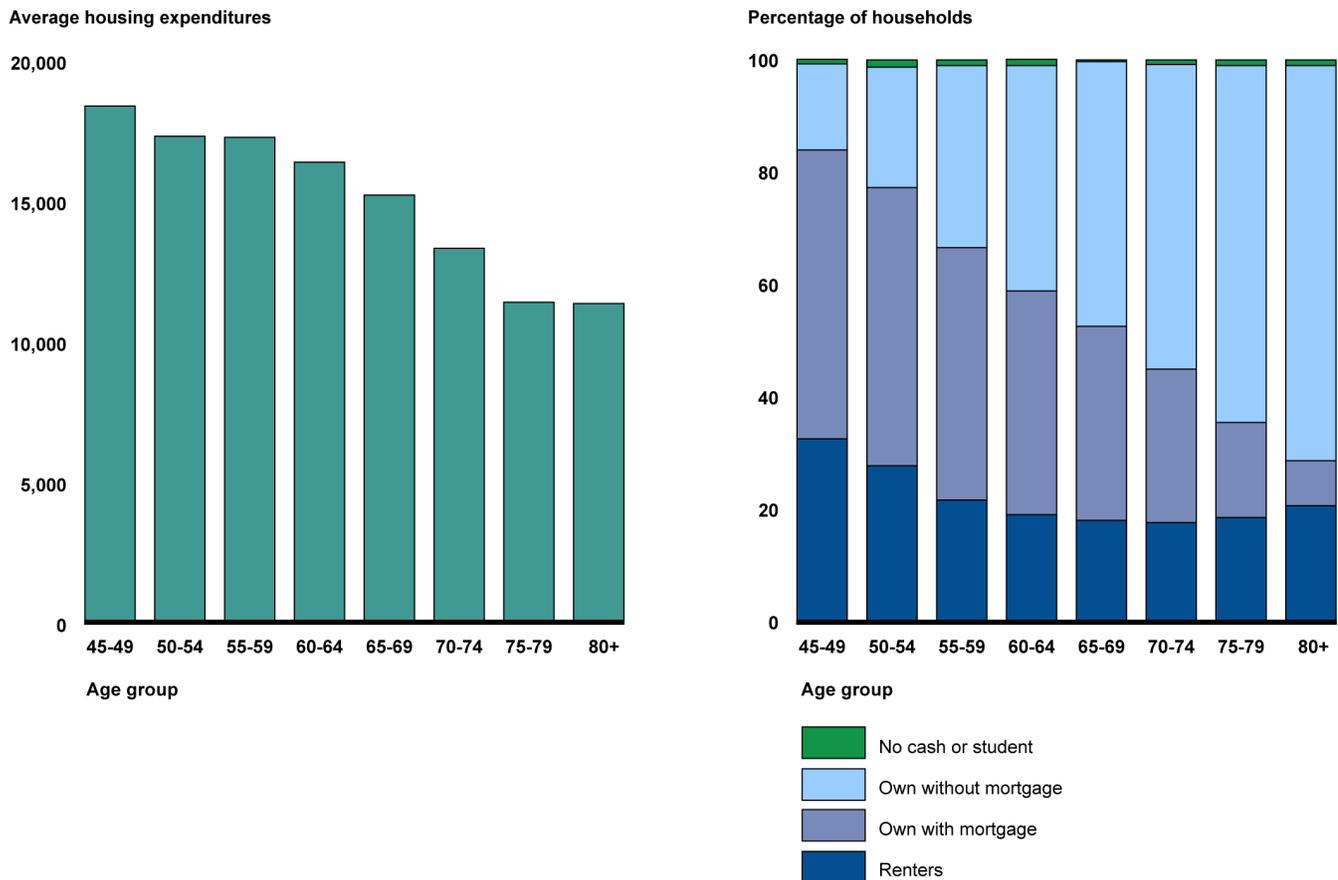
Housing Was the Top Expense Regardless of Age, and Older Households Spent More Out-of-Pocket on Health Care

While the share of spending was relatively consistent across age groups in some categories, there were larger variations by age for other categories. On average, housing was the largest spending category for all age groups. For example, households aged 45 and older consistently spent about a third of total expenditures on housing.²⁰ More specifically, young retiree households spent about 83 percent of the amount that mid-career households spent for housing, on average (see fig. 2). However, the composition of homeowners varied widely by age group. For example, the proportion of homeownership without a mortgage for young retiree households was three times higher than for mid-career households.²¹ Housing expenditures include expenses such as maintenance, operations, and utility costs that can be incurred regardless of ownership status.

²⁰ Housing expenditures include mortgage interest payments but not payments on mortgage principal. While mortgage principal payments may be significant for some families, we found that including these payments did not substantially alter spending patterns observed since housing was a major expense regardless of whether mortgage payments are included. For more information on our analysis of mortgage principal, see appendix II. For the share of spending on housing for households aged 45 and older, the 95 percent confidence intervals are within +/- 2 percentage points. For additional information on housing expenditure estimates and confidence intervals see appendix III.

²¹ According to Survey of Consumer Finances estimates, homeownership has declined from a rate of 68.6 percent in 2007 to 65.2 percent in 2013. According to the American Housing Survey, about one-third of elderly households had a mortgage in both 2007 and 2013. Specifically, from the 2007 American Housing Survey, an estimated 5.3 million out of 18.3 million (or 29 percent) of elderly homeowners had a regular or home equity mortgage. According to data from the 2013 American Housing Survey, an estimated 7.1 million of 21.6 million (or 33 percent) of elderly homeowners had a regular or home equity mortgage. See Board of Governors of the Federal Reserve System, "Changes in U.S. Family Finances from 2010 to 2013: Evidence from the Survey of Consumer Finances" *Federal Reserve Bulletin*, vol. 100, no. 4 (2014); U.S. Census Bureau, *American Housing Survey for the United States: 2007*, Series H150/07 (Washington, D.C.: 2008); and U.S. Census Bureau, *2013 American Housing Survey for the United States* (Washington, D.C.: 2015).

Figure 2: Estimated Average Annual Household Housing Expenditures and Housing Status, 2013



Source: GAO analysis of 2013 Bureau of Labor Statistics Consumer Expenditure Survey, Interview Survey data. | GAO-16-242

Notes: Age groupings are based on the age of the reference person, or the person who rents or owns the home, for the consumer unit. There may be adults in the consumer unit who are older or younger than the reference person. A consumer unit can comprise (1) all members of a household related by blood, marriage, or other legal arrangement, (2) a person living alone or sharing a household but who is financially independent, or (3) two or more persons living together who make joint expenditures. For the purposes of this report, we refer to consumer units as households. We did not adjust spending levels for household size. Housing expenditures include expenses such as rent, utilities, and mortgage interest payments, but do not include payments on mortgage principal. For more information on mortgage principal, see appendix II. The “no cash or student” category represents housing that is occupied as student housing or without payment of cash rent. The percentage of households in this category for all age groups over 45 was around 1 percent or less. For all average housing expenditure estimates in this figure, 95 percent confidence intervals are within +/- 9 percent of the estimate itself. For housing status shares in this figure, 95 percent confidence intervals are within +/- 4 percentage points. For additional information on the confidence intervals for the estimates in this figure, see appendix III.

In contrast to other spending categories, health care was a larger expense for older households.²² For example, young retiree households spent an average of around \$4,900 on health care, compared to about \$3,500 for mid-career households.²³ Older retiree households spent a large share on health care—15 percent of total spending—which was more than double the share that mid-career households spent on health care.²⁴

The age at which expenditures peak also shows how spending patterns varied. For example, the amount a household spends on apparel was estimated to peak at age 42, which was significantly younger than for entertainment, where the amount a household spends was estimated to peak around age 52. Spending on items such as apparel and transportation may be more relevant during a household's working years. Further, spending in some categories may increase with age as households have more time or resources for certain expenses, such as recreational activities.

²²There are multiple federal agency data sources that estimate health care expenditures for different populations. For example, we have previously estimated out-of-pocket health care spending for Medicare beneficiaries using the Centers for Medicare and Medicaid Service's Medicare Current Beneficiary Survey. Estimated average spending per person in 2010 ranged from \$1,737 to \$2,343 depending on supplemental coverage type. For more information, see GAO, *Medicare Supplemental Coverage: Medigap and Other Factors Are Associated with Higher Estimated Health Care Expenditures*, [GAO-13-811](#) (Washington, D.C.: Sept. 19, 2013). The Bureau of Labor Statistics (BLS) provides comparisons of CE estimates to other federal data on health care expenditures. One article found that estimates can vary due to different definitions, methodology, and sources of information. See Ann C. Foster, "Household Health Care Spending: Comparing the Consumer Expenditure Survey and the National Health Expenditure Accounts, 2009-2012" *CE Data Comparison Articles and Presentations*, accessed December 22, 2015, <http://www.bls.gov/cex/cecomparison.htm#NHEA>.

²³The 95 percent confidence interval for average health care spending for young retiree households (aged 65-69) is between \$4,661 and \$5,165. For mid-career households (aged 45-49), the 95 percent confidence interval for average health care spending is between \$3,327 and \$3,765.

²⁴ The 95 percent confidence intervals for the share of spending on health care are between 13.9 and 15.9 percent for older retiree households (aged 80 and older) and between 5.7 and 6.5 percent for mid-career households (aged 45-49).

Unlike for Other Households, Spending Was Relatively Flat Across Low-Income Households Regardless of Age

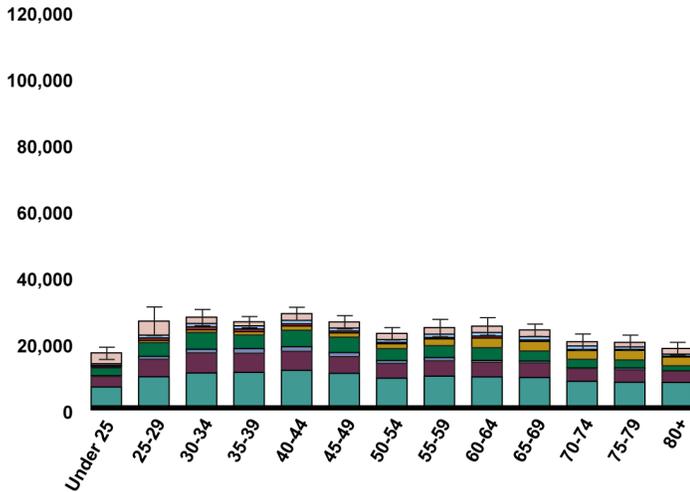
Spending levels across age groups were relatively similar for low-income households, while spending levels were more variable for high-income households (see fig. 3).²⁵ More specifically, the difference in average total spending for low-income households between the mid-career and young retiree age groups was not statistically significant, while the difference across these same age groups was over \$20,000 for the highest income quartile.²⁶

²⁵ Income categories were defined by age-specific income brackets. As a result, for a given age group, each income bracket has approximately the same number of households. For income quartile ranges, see appendix I.

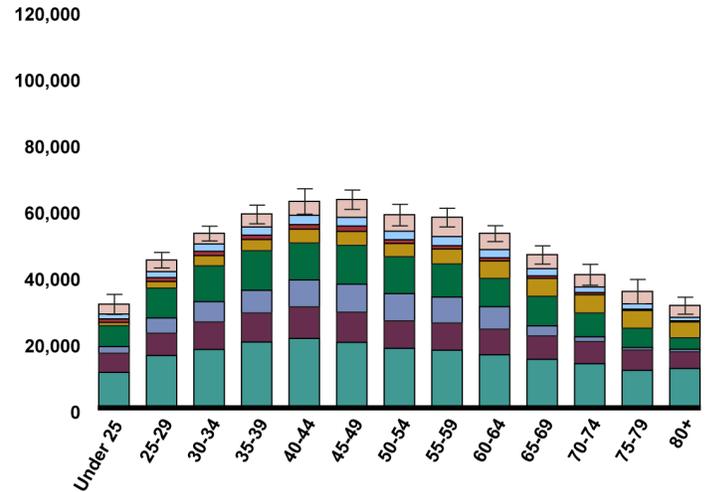
²⁶ The 95 percent confidence interval for the difference between average spending between mid-career households (aged 45-49) and young retiree households (aged 65-69) in the highest income quartile is between \$11,412 and \$28,806. The difference in spending between mid-career households and young retiree households across all income quartiles was about \$11,700.

Figure 3: Estimated Average Annual Household Expenditures by Income Quartile, 2013

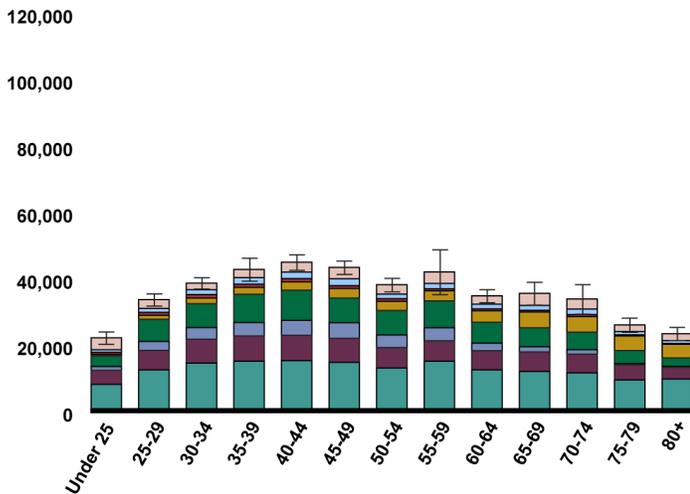
Average household expenditures - lowest income quartile



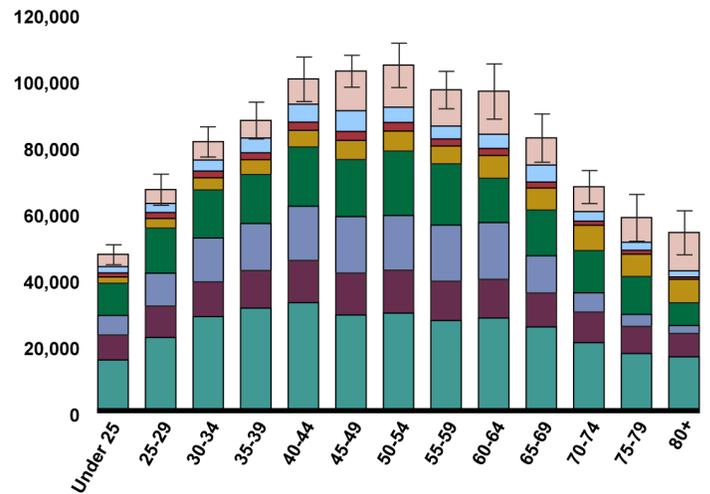
Average household expenditures- 3rd income quartile



Average household expenditures- 2nd income quartile



Average household expenditures- highest income quartile



Age group



Source: GAO analysis of 2013 Bureau of Labor Statistics Consumer Expenditure Survey, Interview Survey data. | GAO-16-242

Notes: Age groupings are based on the age of the reference person, or the person who rents or owns the home, for the consumer unit. There may be adults in the consumer unit who are older or younger than the reference person. A consumer unit can comprise (1) all members of a household related by blood, marriage, or other legal arrangement, (2) a person living alone or sharing a household but who

is financially independent, or (3) two or more persons living together who make joint expenditures. For the purposes of this report, we refer to consumer units as households. We did not adjust spending levels for household size. Income categories were defined by age-specific income brackets. As a result, each income bracket at each age group has approximately the same number of households. See appendix I for income quartile ranges. Income includes some non-wage sources from public programs, such as Supplemental Security Income and unemployment compensation. The "other" category of spending includes expenditures for reading, tobacco, alcoholic beverages, education, cash contributions, personal care, and miscellaneous expenses. The "personal insurance and pensions" category includes deductions for government and railroad retirement, private pensions, and Social Security. According to Bureau of Labor Statistics officials, the private pensions category includes defined benefit, defined contribution, and individual retirement accounts. Housing expenditures include expenses such as rent, utilities, and mortgage interest payments, but do not include payments on mortgage principal. For more information on mortgage principal, see appendix II. For more information on Consumer Expenditure Survey expenditure categories and treatment of taxes, see appendix I. For average total spending, the 95 percent confidence intervals are within +/- 17 percent of the estimate itself for all age groups.

Though low-income households had much lower overall spending than mid- or high-income levels, they spent a larger share on necessities like housing and food, which could have implications for their respective replacement rates. Low-income young retiree households had an average of around \$23,500 in out-of-pocket spending, with 39 percent spent on housing and 19 percent on food.²⁷ In comparison, high-income households in the same age group spent about \$82,200, of which 31 percent was spent on housing and 12 percent on food.²⁸ While spending levels provide information on consumption, expenditures do not necessarily equate to a household's level of consumption. For example, a household could consume the same amount of food at different expenditure levels based on the difference in cost between preparing food at home versus eating out. Additionally, households may spend money on goods they are not consuming themselves, such as charitable contributions or gifts. Alternatively, some low-income families may receive benefits from public assistance programs that allow for higher levels of consumption than out-of-pocket spending indicates. For example, households may be eligible for programs that offset some of the costs of certain expenses, such as reduced-price school lunch or subsidized

²⁷The 95 percent confidence interval for average total spending is between \$21,675 and \$25,307 for young retiree households (aged 65-69) in the lowest income quartile. For this same group, the 95 percent confidence intervals for the share of spending are between 37 and 41 percent for housing, and between 18 and 20 percent for food.

²⁸The 95 percent confidence interval for average total spending is between \$74,961 and \$89,485 for young retiree households (aged 65-69) in the highest income quartile. For this same group, the 95 percent confidence intervals for the share of spending are between 29 and 33 percent for housing and between 12 and 13 percent for food.

housing.²⁹ Nevertheless, with a substantial portion of spending going toward basic expenses, households with limited resources may not have much flexibility to adjust spending levels. Consequently, a household's socioeconomic status could affect the level of resources required to plan for future spending needs.

Spending, Household
Characteristics, and
Earnings Are Key
Factors Used by
Researchers and
Financial
Professionals to
Develop Target
Replacement Rates

²⁹For more information on federal programs for low-income families, see GAO, *Federal Low-Income Programs: Multiple Programs Target Diverse Populations and Needs*, [GAO-15-516](#) (Washington, D.C.: July 30, 2015).

Changes in Spending Are Important to Account for When Deciding How Much Income Should Be Replaced in Retirement

We found that accounting for how a household's spending may change in retirement is an important step in determining a target replacement rate—that is, a recommendation for how much pre-retirement income an individual or household needs to replace in retirement.³⁰ According to the articles and reports we reviewed, assumptions need to be made about the direction and size of a number of expenses, including housing, health care, entertainment, and consumer goods. For example, a retired household may spend less on housing if it pays off a mortgage or downsizes at retirement (see table 3). Alternatively, spending on housing may increase if a retiree moves into specialized senior housing. The amount a retired household will spend on health care may fluctuate because health care costs can be variable and premiums and out-of-pocket medical costs may rise.³¹ Further, spending on entertainment and consumer goods may also fluctuate, according to the articles and reports we analyzed. Entertainment spending could increase because retirees have more leisure time, or alternatively, it is possible that it decreases due to the prevalence of entertainment-related senior discounts.³² In addition, spending on consumer goods and services, such as ready-to-eat foods or car repairs, may be less in retirement than before because retired households have more free time to engage in in-home production, which includes activities like cooking and household chores and repairs. Moreover, consumer durables purchased prior to retirement, such as

³⁰ Our analysis focused on total replacement rates, that is, the ratio of all income in retirement—including from Social Security, pension benefits, and retirement savings—to pre-retirement earnings. For this analysis, we reviewed 59 articles and reports discussing income replacement rates in retirement. These reports were published in academic journals or by research centers or international organizations. We sought to identify a number of considerations that researchers, policy makers, and financial professionals incorporate into their assumptions when developing, calculating, or evaluating target replacement rates. However, because analyzing the merits and disadvantages of each consideration was outside the scope of our work, we are not endorsing any of the considerations presented in this report. For a complete list of reports and articles reviewed and more information on our methodology, please see the bibliography at the end of this report. Also, for more information on factors that could inform a target replacement rate in addition to spending, household characteristics, and pre-retirement earnings, see appendix IV.

³¹ For more information on the role long-term care costs may play in retirement, specifically, see appendix V.

³² Retirees may also look for discounts and bargains on other expenditures in addition to discounts on entertainment activities. Pursuing such discounts could lower overall spending.

furniture or household appliances, may continue working well into retirement and may not need to be replaced.

Table 3: Spending Considerations That Could Inform a Target Replacement Rate

Spending on housing	<p>Housing expenses may change in retirement. For example, housing costs may go down if a retiree pays off a mortgage right before or during retirement or a retiree downsizes or moves to an area with less expensive housing. On the other hand, housing costs may go up if a retiree moves to specialized senior housing.</p> <p>Mortgages may not be paid off at the beginning of retirement. According to our analysis of the 2013 Consumer Expenditure Survey data, 35 percent of households aged 65-69 are paying down a mortgage.</p>
Spending on health care	<p>Health care costs may be more variable in retirement.</p> <p>Health care premiums and out-of-pocket medical costs may change.^a</p>
Spending on work-related expenses	<p>Work-related expenses, such as work clothing, meals outside the home, and transportation decline after retirement.</p>
Spending on education	<p>Retirees who finish paying off their children's education right before retirement may need to replace less income.</p>
Spending on entertainment	<p>Entertainment expenses may go up for some retirees and down for others. For example, retirees have more leisure time and may spend more on entertainment. On the other hand, retirees may be able to stretch their dollars on entertainment due to senior discounts.</p>
Spending on other consumer goods	<p>Households may engage in more in-home production after retirement and, therefore, spend less money overall.</p> <p>Consumer durables purchased prior to retirement may last into retirement or may need to be replaced less often.</p>
Theoretical views on consumption	<p>Individuals may want to smooth consumption over a lifetime, or, more specifically, the marginal utility of consumption. However, consumption or spending patterns in retirement may fluctuate over time. For example, at the beginning of retirement, retirees may spend money on things like travel. Later on, their overall expenses may drop. As retirees age, expenses may rise again due to increased need for health care.</p> <p>Households may spend less in retirement for two reasons. On the one hand, they may spend less because they are content with consuming less, in part because they enjoy leisure time in addition to consumption. Alternatively, they may spend less because they have less income.</p>
Spending from savings and assets	<p>Some researchers have suggested considering whether people use their savings and assets for spending, and how to account for that when developing a target replacement rate.</p>
Debt	<p>Retirees may have major debts to pay off. Debt accumulation or reduction could affect the replacement rate a household will need to maintain its standard of living.</p>
Socioeconomic status before retirement	<p>Replacement rate targets may vary by income level. For example, lower-income households may need a higher replacement rate because they spend a relatively high proportion of their income on non-discretionary expenses such as food, clothing, shelter, and health care.</p>

Taxes

Taxes may be different before and after retirement. After retirement, many retirees pay less of their income to taxes because they are no longer subject to Social Security payroll taxes, Social Security benefits are partially or fully tax free, and, according to some researchers, there are more income tax deductions for those aged 65 and over. In addition, retirees may be in a lower income tax bracket than prior to retirement. This decreases the percentage of income that needs to be replaced in retirement.^b

People may move to a different state at retirement and, consequently, face higher or lower income taxes.

Source: GAO analysis of articles and reports discussing income replacement rates in retirement. | GAO-16-242

Notes: We sought to identify a number of considerations that researchers, policy makers, and financial professionals could incorporate into their assumptions when calculating target replacement rates. However, GAO is not endorsing any of the considerations presented in this report.

^aThe Patient Protection and Affordable Care Act may affect out-of-pocket health care costs and insurance premiums.

^bIndividuals need to take into account whether their retirement savings are in tax-deferred or after-tax accounts when planning for retirement. Often, participants have tax-deferred accounts and the balances they see on account statements do not account for taxes that will be owed when a retiree begins withdrawing funds from these accounts. Thus, the full amounts are not available for consumption spending.

Further, researchers make assumptions about why overall spending might change in retirement and the role of socioeconomic status, or income level, before retirement. For example, some researchers have proposed that consumption, for which spending is a proxy, declines in retirement and households are generally content with consuming less as retirement progresses. Alternatively, households may aim to smooth their consumption over their lifetime and, thus, the goal in retirement is to maintain the same level of consumption or spending as prior to retirement. Under this theory, households that spend less in retirement may do so because of income constraints.³³ Some researchers have explored the role that socioeconomic status plays in determining target replacement rates. They have found that targets may vary by income level. Lower-income households may need a higher replacement rate because they spend a relatively high proportion of their income on nondiscretionary items, such as food. Theoretical perspectives about spending could influence the assumptions used to calculate a target replacement rate.

Assumptions about households' tax liabilities also affect estimates of how much income is needed to cover expenses in retirement, and target

³³ It is possible that spending declines in retirement for other reasons as well. For example, as previously mentioned, retirees may find they have more time to compare the price of goods and services across retailers or businesses.

replacement rates. Not only do tax liabilities vary across households, they can also vary before and after retirement. For example, retirees may be in a lower tax bracket after retirement. In addition, Social Security benefits are partially or fully tax free, and according to some researchers, there are more income tax deductions for those aged 65 and older.

Household Size Also Affects Income Needs in Retirement

According to the articles and reports we reviewed, household characteristics, particularly household size, play an important role in determining a household's expenses, its income needs in retirement, and a target replacement rate (see table 4). For example, the presence of children could also affect what a target replacement rate should be. Researchers do not agree on how having had children affects a retired household's income needs. According to some researchers, retirees will focus on maintaining spending on themselves and will not need to replace income that went toward their children's consumption. Further, some researchers have hypothesized that after children move out, the household will save more; and because the household saves more, leaving less money to spend during its remaining working years, the percentage of income that needs to be replaced in retirement is reduced. On the other hand, other researchers have theorized that once children move out, households may not actually consume less. Instead, the parents may choose to use the money they had spent on their children on themselves. Thus, the percentage of income needed to be replaced in retirement may not be lower for retirees who had children versus those who did not.³⁴

³⁴ A recent working paper found that households increase contributions to 401(k) plans by only a small amount when children leave home and project that these households may not have sufficient resources in retirement to maintain their standard of living. See Irena Dushi, Alicia H. Munnell, Geoffrey T. Sanzenbacher, and Anthony Webb, "Do Households Increase Their Savings When the Kids Leave Home?" *Center for Retirement Research at Boston College Working Paper*, vol. 2015 no. 26 (September 2015).

Table 4: Household Characteristic Considerations That Could Inform a Target Replacement Rate

Marital status of household	<p>The replacement rate needed for a married versus single household may be different because the cost of living for a couple is not twice the cost of living for a single person. Couples benefit from economies of scale because they share some resources, such as housing. Accounting for these economies of scales may be useful.</p> <p>Different target replacement rates may be useful for married households where only one spouse worked versus married households where both spouses worked.</p> <p>It may be difficult to identify a target replacement rate for a married household if the members of the couple retire at different times, especially if there is a substantial age difference between the two members of the couple.</p> <p>Potential changes in the composition of the household (e.g., change from married to single or vice-versa) could affect the replacement rate a household will need in retirement.</p>
Role of children in the household	<p>Some researchers have argued that retirees' goal will be to maintain spending on themselves only and, thus, households that had children before but not after retirement will need a lower replacement rate in retirement.</p> <p>Researchers have also hypothesized that after children move out, a household not yet retired will start saving at a higher rate, which could reduce the percentage of income needed to be replaced in retirement.</p> <p>On the other hand, other researchers have hypothesized that once children leave, households may not actually consume less and save more. Households may have become accustomed to a certain level of spending. Thus, the amount of income needed to be replaced in retirement may not be lower for retirees who had children.</p> <p>Retirees may have adult children move back into their house and, as a result, these children continue to be an expense.</p>
Age of household at retirement	<p>Target replacement rates for those retiring earlier may be lower. These households may be saving at a higher rate since they will not have as many years to save for retirement. As a result, they will be living off a smaller percentage of their income before retirement.</p>

Source: GAO analysis of articles and reports discussing income replacement rates in retirement. | GAO-16-242

Notes: We sought to identify a number of considerations that researchers, policy makers, and financial professionals could incorporate into their assumptions when calculating target replacement rates. However, GAO is not endorsing any of the considerations presented in this report.

However, household characteristics may not be static, making choosing a target replacement rate even more complex. For example, spouses may not retire at the same time. Further complicating matters is the fact that retirees may marry, divorce, or become widowed, changing the size of their household and the replacement rate needed to cover the household's income needs.³⁵

³⁵ Our past work has shown that becoming divorced or widowed can have detrimental effects on income security for people who are approaching or in retirement. Moreover, these effects are more pronounced for women than men. See GAO, *Retirement Security: Women Still Face Challenges*, [GAO-12-699](#) (Washington, D.C.: July 19, 2012).

Target Replacement Rates Can Vary by Pre-Retirement Earnings Level or if Different Definitions of Earnings Are Used

Low earners had the highest target replacement rates and high earners the lowest target rate, according to studies we reviewed. Some of the studies in our review developed different target rates for workers based on earnings level before retirement. While these studies did not use the same earnings-level groups, their conclusions were consistent.³⁶ Specifically, Aon Hewitt projected that workers earning under \$30,000 would need a 98 percent replacement rate and that workers earning \$90,000 would need to replace 79 percent of their income.³⁷ Lower earners may need a higher replacement rate for three reasons. First, as discussed earlier, they may spend a relatively high amount of their income on non-discretionary items. Second, research has shown low-income households save less than higher-income households. Thus, the reduction in saving in retirement will be less substantial for low-income households and they may need a higher replacement rate.³⁸ Third, because low-income households pay little in taxes, they receive little in the way of tax saving in retirement.

In addition, how pre-retirement earnings are defined and calculated can have important implications for target replacement rates. More specifically, developers of target replacement rates must decide upon a period of earnings to use (see table 5). Two options cited by the articles and reports in our review are final average earnings and average earnings over the course of a career. A final average earnings measure uses the average of annual earnings for a period of time leading up to

³⁶ For example, Aon Hewitt developed unique targets for multiples of \$10,000 (i.e., one target for workers earning \$10,000 a year, one for workers earning \$20,000, another for \$30,000 and so on). Alternatively, Pang and Warshawsky calculated target replacement rates for low, medium, high, and “rapid” growth earners. For comparison, the Office of the Chief Actuary in the Social Security Administration has developed hypothetical earnings levels for very low, low, medium, and high earners where career average indexed earnings in 2014 were \$11,697, \$21,054, \$46,787, and \$74,859, respectively. See Aon Hewitt, *The Real Deal: 2012 Retirement Income Adequacy at Large Companies* (2012); Gaobo Pang and Mark J. Warshawsky, “Implications of Some Deficit Reduction Proposals for Retirement Savings,” *Benefits Quarterly*, vol. 28, no. 2 (2012); and Social Security Administration, Office of the Chief Actuary, “Replacement Rates for Hypothetical Retired Workers,” Actuarial Note 2014.9 (Baltimore, MD: July 2014).

³⁷ Aon Hewitt (2012).

³⁸ Scholz and Seshadri (2009).

retirement.³⁹ Career average earnings measures, on the other hand, use the average of annual earnings over the course of someone's career, adjusted for inflation or wage growth. Furthermore, because different definitions of earnings can affect the final target replacement rate, it is important to understand how earnings were calculated and indexed. For example, adding up separate replacement rates provided by defined benefit plans and Social Security benefits to come up with a total replacement rate may not be accurate if the two rates did not use the same type of pre-retirement earnings or index these earnings the same way.

Table 5: Pre-Retirement Earnings Considerations That Could Inform a Target Replacement Rate

Choosing earnings	Pre-retirement earnings could be measured in many ways, including as final average earnings, wage-indexed average career earnings, inflation-adjusted average career earnings, or constant income payable from present value of lifetime earnings.
	The goal of the target replacement rate may be to replace earnings right before retirement or to smooth consumption over a retiree's life.
	Many people do not have steady earnings histories, making it unclear what earnings should be replaced. For example, if income was irregular over an individual's work history, final earnings may not be a good measure of earnings.
	Using final average earnings over career average earnings, or vice-versa, can have a large effect on the resulting replacement rate. Different earnings calculations may be relevant to different circumstances.
	Comparing target replacement rates using final average earnings versus career average earnings could be considered comparing apples to oranges. When comparing separate target replacement rates provided by retirement savings or pensions to Social Security benefits, users may want to think about the implications of the earnings choices.
Substantial changes in earnings	Substantial changes in earnings late in a career can have a large effect on calculating a household's replacement rate. For example, if final earnings are used to calculate a target replacement rate, then unemployment late in a worker's career could alter the target rate.
Using final average earnings	Final earnings could be measured many ways. For example, a final earnings calculation could use the last 5 years of earnings or the best 3 years out of the last 10 years of work.
Using career average earnings	Target replacement rates using career average earnings could also be measured in different ways. For example, they could be measured and compared for hypothetical workers, such as a stylized medium earner. However, calculating earnings for hypothetical workers requires numerous assumptions. Further, stylized earnings represent the situation of only a handful of individuals. On the other hand, one researcher argued that the pattern of earnings is not important for calculating indexed career average earnings; rather, what matters is whether the average wage index matches up with the earnings experience of actual workers.

³⁹ For example, final earnings could be the average of annual earnings for the last 5 years of work. Another example would be to use the average of the best 3 years of earnings out of the last 10 years of work.

	Women tend to have shorter careers than men because they take a greater number of career breaks from the workforce to care for family members.
Indexing earnings	Earnings could be indexed using inflation. Using the consumer price index to adjust earnings compares an individual's retirement income to the absolute level of real pre-retirement spending the individual actually experienced. Alternatively, indexing earnings to wage growth also incorporates a comparison to the consumption of current workers.
Phased retirement	It is harder to calculate replacement rates if retirement is phased because the phasing of retirement has implications for calculating pre-retirement earnings and retirement income. For example, should earnings from work be considered retirement income?
Defining pre-retirement income	Measures of pre-retirement income could include other sources of income besides wages, such as government transfers.

Source: GAO analysis of articles and reports discussing income replacement rates in retirement. | GAO-16-242

Notes: We sought to identify a number of considerations that researchers, policy makers, and financial professionals could incorporate into their assumptions when calculating target replacement rates. However, GAO is not endorsing any of the considerations presented in this report.

Other decisions may need to be made about how to account for work histories or changes in earnings or phased retirement. For example, women often have shorter careers than men. They tend to take a greater number of breaks from the labor force to care for children and elderly relatives. As a result, a replacement rate that uses career average earnings could be distorted by these breaks. In addition, changes to earnings late in a career can have a substantial effect on target replacement rates if final average earnings are used to calculate pre-retirement income. Phased retirement could also change a target replacement rate, depending on how it is incorporated into the calculation. For example, if workers phase into retirement by reducing their hours and earnings over a number of years, then using the average of the final 5 years of earnings could result in a much lower measure of pre-retirement income than using career average earnings. Similarly, how retirement income is defined can have implications for target replacement rate recommendations. For more information on how the definition of retirement income and other factors can affect target replacement rates, see appendix IV.

Some Financial
Professionals
Recommend Target
Replacement Rates While
Others Question Their
Usefulness

Six of 14 (or 43 percent) of the service providers, consultants, and financial planners who responded to our questionnaire recommend a target replacement rate to plan participants or clients.⁴⁰ Four of the six developed customized replacement rate targets for plan participants and used information such as asset levels, expected spending, and household composition to calculate target rates. One service provider told us it uses answers to five multiple-choice questions that ask about lifestyle preferences and spending patterns, along with information about retirement accounts, to calculate customized target replacement rates for most plan participants. Two other respondents reported using simplified “rules of thumb.”

The remaining eight service providers, consultants, and financial planners do not recommend a retirement replacement rate and questioned their usefulness for plan participants or clients. For example, according to one consultant, using a set rate or a rule of thumb is not appropriate for everyone. In addition, two financial planners told us that income needs in retirement are typically expense- or goals-based or income-based. Further, they explained each household’s income needs are unique and may change over time.

Researchers have also cited concerns about the usefulness of replacement rates in their current form. In particular, a 2011 report by MacDonald and Moore found that any one target rate fits relatively very few individuals.⁴¹ Further, the authors explained that there is no consensus on the best approach to estimate replacement rates and that its conceptual grounding in past research has often been weak.

The number of different replacement rates cited in the literature also calls into question the extent to which replacement rates are useful. We identified about 500 references to target replacement rate

⁴⁰ We collected information from 14 service providers, retirement services consulting firms, and financial planners using a questionnaire. We asked the respondents a series of questions about target replacement rates they use in their work or alternative metrics, if they did not use replacement rates. See appendix I for more information on the questionnaire.

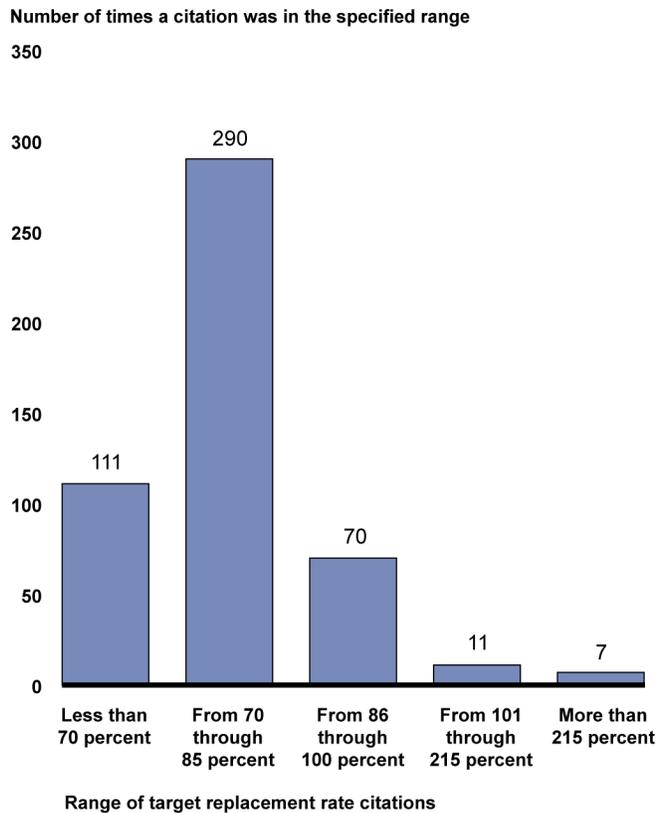
⁴¹ Bonnie-Jeanne MacDonald and Kevin D. Moore, *Moving Beyond the Limitations of Traditional Replacement Rates*, sponsored by the Society of Actuaries’ Pension Section (September 2011).

recommendations in 52 articles and reports (see fig. 4).⁴² These recommendations were either cited as rules of thumb or analysis results. The recommendations ranged from 43 to 476 percent of pre-retirement income, with the majority of the references being between 70 and 85 percent of pre-retirement income; the median recommended target replacement rate was 77 percent.⁴³

⁴² We did not include reports and articles published by international organizations, leaving us with 52 of the 59 selected studies for this particular analysis. Countries have different pension and social safety net systems, making it hard to compare the rates calculated and used in these studies with those found in studies that focus solely on the United States. For more on our methodology, see appendix I.

⁴³ Replacement rates may be more than 100 percent to account for certain risks, such as longevity, catastrophic health care costs, and investment risk. For example, one researcher accounted for these three risks and calculated target replacement rates. The recommended target rates in this researcher's study ranged from 43 percent to 476 percent. For instance, to achieve a 90 percent probability of having adequate retirement income once longevity, investment, and catastrophic health care risks have been accounted for, a low-income male who plans on retiring at age 62 should have a target replacement rate of 476 percent. See Jack VanDerhei, "Measuring Retirement Income Adequacy: Calculating Realistic Income Replacement Rates," *Employee Benefit Research Institute Issue Brief*, no. 297 (September 2006). For more on the cost of long-term health care, see appendix V.

Figure 4: Many Target Replacement Rate Recommendations Are between 70 and 85 Percent



Source: GAO analysis of articles and reports discussing retirement replacement rates. | GAO-16-242

Note: The citations came from our selected studies, excluding those published by international organizations, for a total of 52 studies and reports. Countries have different pension and social safety net systems, making it hard to compare the rates calculated and used in these studies with those found in studies that focus solely on the United States. The citations were grouped into the ranges above. They did not encompass the entire range. For example, if the study cited a target replacement rate of 75 percent, it is included in the “from 70 percent through 85 percent” bar. See the bibliography at the end of this report for a complete list of studies.

Despite their inherent limitations, particular groups of workers may find replacement rates to be a useful planning tool, making it important that these groups receive clear information on replacement rate recommendations, according to the articles and studies in our review. For example, target replacement rates may be more useful for low- and middle-income households in part because they are more likely to face budget constraints in retirement and will likely need a higher replacement rate compared to high-income households. Also, many individuals lack basic financial knowledge, and lower- and middle-income individuals

scored lower on a recent national financial capability assessment.⁴⁴ Replacement rates may also be useful for younger individuals because they can use a replacement rate as a metric to estimate if their projected retirement savings are reasonable.⁴⁵

Further, the 2011 MacDonald and Moore report concluded that the replacement rate literature is becoming more sophisticated and capable of providing better guidance. It found that incorporating some individual characteristics—such as income and family size—could improve the usefulness of replacement rate calculations. Customizable replacement rates could be one alternative to universal target replacement rate recommendations. We found that there are numerous calculators and tools available online to help individuals determine how much they need to save, but research has found wide variability in how such programs work and in the outcomes they produce.⁴⁶ Given that variability, some researchers have expressed concern that individuals may be unable to identify tools that are relevant for their individual circumstances. With regard to target replacement rates, we found some online tools that used target replacement rates in calculations did not permit users to adjust the value of the rate. Though we also found several that allowed users to adjust the rate used and provided additional—but still concise—information to help users select an appropriate rate.⁴⁷ For example,

⁴⁴ In addition, fewer than half of low- and moderate-wealth consumers have ever used the services of a financial professional for retirement planning. See FINRA Investor Education Foundation, *Financial Capability in the United States: Report of Findings from the 2012 National Financial Capability Study* (May 2013); Dan Iannicola Jr., and Jonas Parker, *Barriers to Financial Advice for Non-Affluent Consumers*, Sponsored by the Society of Actuaries' Actuary of the Future and Product Development Sections (September 2010).

⁴⁵ However, using such a metric would require that workers be able to crosswalk replacement rates with specific savings levels. Vickie Bajtelsmit, Anna Rappaport, and LeAndra Foster. *Measures of Retirement Benefit Adequacy: Which, Why, for Whom, and How Much?* Sponsored by the Society of Actuaries' Pension Section and Pension Section Research Committee (January 2013).

⁴⁶ For example, see John A. Turner, "Rating Retirement Advice: A Critical Assessment of Retirement Planning Software." *Pension Research Council Working Paper*, vol. 2010, no. 3 (April 2010) and John A. Turner and Hazel A. Witte, *Retirement Planning Software and Post-Retirement Risks* (Schaumburg, IL: Society of Actuaries, 2009).

⁴⁷ For example, see AARP's retirement calculator (<https://secure.aarp.org/ws/info-2015/retirement-calculator.html>) and the Ballpark E\$imate (<http://www.choosetosave.org/ballpark/>).

AARP's retirement saving calculator provides replacement rate defaults corresponding to three different lifestyle options as well as the ability to adjust the replacement rate to any whole number.

Limited Explanation of Replacement Rates in Department of Labor Retirement Planning Materials May Leave Workers Uncertain about How to Use Them

DOL's Employee Benefits Security Administration (EBSA) provides guidance on retirement income savings for workers via a number of publications available in print and online. For example, EBSA provides a brief and simple explanation of retirement replacement rates in retirement planning materials and guidance for workers.⁴⁸ Among EBSA's retirement planning publications is one that is intended to help younger workers understand how much they need to save for retirement.⁴⁹ The publication includes worksheets to help workers calculate their savings needs and it is available in print and as an interactive online tool. This document notes that replacement rates might vary depending on an individual's circumstances (see fig.5).

⁴⁸ We also reviewed the websites of the SSA, Consumer Financial Protection Bureau, Pension Benefit Guaranty Corporation, Securities and Exchange Commission, and the Administration on Aging for retirement planning documents that might contain references to replacement rates. We found text in SSA and Consumer Financial Protection Bureau documents that allude to the concept of replacement rates, but do not include a definition of replacement rate or provide any information on how to calculate them. For example, an insert SSA includes in the statements it provides to workers aged 25-34 includes the following statement: "Financial planners generally agree retirees will need about 70-80 percent of preretirement earnings to enjoy a comfortable retirement. For an average worker, Social Security replaces about 40 percent of annual preretirement earnings, so you will need to save and invest to ensure an adequate income during retirement for you and your family." Social Security Statement Sample for young Workers (ages 25-34), Form SSA-7005-SM-SI (09/14), Social Security Administration. We found no references to replacement rates in retirement planning materials from the other agencies.

⁴⁹ U.S. Department of Labor, Employee Benefits Security Administration, *Savings Fitness: A Guide to Your Money and Your Financial Future*. Another EBSA publication, *Taking the Mystery Out of Retirement Planning*, published in December 2014, is designed specifically to help older workers nearing retirement determine how much they need for retirement. *Taking the Mystery* is also available in print and as an interactive tool. The print version of this tool for older workers tells users: "If you want a quick estimate of how much monthly income you'll need to cover expenses in retirement, figure on at least 70 percent of your preretirement income. Many experts are now increasing that figure to 80 or 90 percent." However, it does not use a replacement rate in any of the worksheets.

Figure 5: Excerpt from EBSA’s *Savings Fitness: A Guide to Your Money and Your Financial Future*

There are numerous worksheets and software programs that can help you calculate approximately how much you’ll need to save. Professional financial planners and other financial advisers can help as well. At the end of this booklet, we provide *Worksheet 4—Retirement Savings* to get you started.

Here are some of the basic questions and assumptions to keep in mind.

How much retirement income will I need?

An easy rule of thumb is that you’ll need to replace about 80 percent of your pre-retirement income. If you’re making \$50,000 a year (before taxes), you might need about \$40,000 a year in retirement income to enjoy the same standard of living you had before retirement.

Think of this as your annual “cost” of retirement.

However, no rule of thumb fits everyone. Expenses typically decline for retirees: taxes are smaller (though not always) and work-related costs usually disappear. But overall expenses may not decline much if you still have a home and other debts to pay off. Large medical bills may keep your retirement costs high. Much will depend on the kind of retirement you want to enjoy. Someone who plans to live a quiet, modest retirement in a low-cost part of the country will need a lot less money than someone who plans to be active, take expensive vacations, and live in an expensive region.

Source: GAO selected excerpt from U.S. Department of Labor, Employee Benefits Security Administration (EBSA), *Savings Fitness: A Guide to Your Money and Your Financial Future*. | GAO-16-242

The publication notes that no rule of thumb is appropriate for all individuals and also includes information that some expenses may change in retirement and descriptions of some lifestyle choices that may affect how much income workers need to replace (see fig. 5).⁵⁰ Despite DOL’s appropriate acknowledgement of such considerations, its worksheet for calculating how much to save each year assumes a fixed replacement rate of 80 percent. The worksheet assumes that Social Security benefits will provide about 40 percent of pre-retirement income and the remaining 40 percent would need to come from savings. While the previous page explains that the replacement rate provided is an

⁵⁰ U.S. Department of Labor, Employee Benefits Security Administration (EBSA), *Savings Fitness: A Guide to Your Money and Your Financial Future*.

estimate and the user may need more or less depending on their circumstances, “x .40” is pre-printed in the worksheet for users to calculate the amount of savings needed when they retire (see fig. 6).

Similarly, in the interactive online version of *Savings Fitness*, the fixed target replacement rate is coded into the calculation and cannot be changed. DOL officials told us that they worked to balance accuracy with simplicity by presenting information in a concise manner that will not overwhelm users. Specifically, they said that they did not make the rate adjustable in order to limit user flexibility and prevent too wide a range in assumptions. They also indicated that they limited the information on factors that could affect replacement rates to keep the document from being too complex and cluttered. ERISA calls for DOL to provide on its website “a means for individuals to calculate their estimated retirement savings needs based on their retirement income goal as a percentage of their preretirement income”.⁵¹ While the planning tool allows workers to estimate their savings needs based on a percentage of their preretirement income, they are constrained in setting an individual retirement income goal as the replacement rate is preset by DOL. Without the ability to adjust the replacement rate used in the tools, workers may over- or under-estimate how much they need to save for retirement.

⁵¹ 29 U.S.C. § 1146(d).

Figure 6: Excerpt from *Savings Fitness: A Guide to Your Money and Your Financial Future, Worksheet 4*

Step 1.

1. Number of years until retirement (retirement age minus current age) _____
2. Current annual salary _____
3. Projected salary growth factor _____
4. Value of salary at retirement (multiply line 2 X line 3) _____
5. Replacement rate _____ **x .40**
6. Income goal for the first year of retirement (multiply line 4 X line 5) _____

PROJECTED SALARY GROWTH FACTORS (by number of years until retirement)					
20	25	30	35	40	45
1.8061	2.0938	2.4273	2.8139	3.2620	3.7816

For example, if you are now 30 years old, plan to retire in 35 years at age 65, and earn \$50,000 a year, the calculation for Step 1 would look like this:

Example for Step 1

Number of years until retirement	35
Current annual salary	\$50,000
Projected salary growth factor	x 2.8139
Value of annual salary at retirement	<u>\$140,695</u>
Replacement rate	x .40
Income goal for the first year of retirement	<u>\$56,278</u>

Source: GAO selected excerpt from U.S. Department of Labor, Employee Benefits Security Administration (EBSA), *Savings Fitness: A Guide to Your Money and Your Financial Future*. | GAO-16-242

In addition, the *Savings Fitness* explanations provided concerning the replacement rate in the calculation do not include specific information on demographic groups that studies suggest generally need higher or lower

replacement rates, such as low-income and single workers. For example, one study found that the median optimal target replacement rate for singles was 55 percent compared to 75 percent for married couples.⁵² Also, we found no discussion in the EBSA materials about how much the replacement rate provided might need to be adjusted for the examples of circumstances that might affect an individual's desired replacement rate. For instance, though it suggests that someone who wants to travel extensively will need more money in retirement, there is no information on how to adjust the replacement rate to account for such a situation. Such information and guidance could help workers assess whether they need to customize the rate used in their own calculations.

Academic and industry-based researchers consistently state that there is no one-size-fits-all target, and some note that averages can be misleading and dangerous for personal planning purposes.⁵³ They also highlight particular demographic groups that often need higher or lower income replacement (married vs. single; with/without children; by income level). Financial literacy research highlights the necessity of using relatable examples and realistic scenarios, targeting by income, and tailoring communications as effective means of educating and motivating. For instance, one review of retirement planning software suggests that such tools should provide the user assistance in setting a target replacement rate and should recognize the different needs of those with and without children.⁵⁴ Similarly, an ERISA Advisory Council report cited research that found that communications specifically targeted to

⁵² Scholz and Seshadri (2009).

⁵³ For example, Bajtelsmit, Rappaport, and Foster (2013).

⁵⁴ John A. Turner, "Rating Retirement Advice: A Critical Assessment of Retirement Planning Software." *Pension Research Council Working Paper*, vol. 2010, no. 3 (April 2010).

participants based upon their interests, background, and/or economic status were more successful than providing general communications.⁵⁵

Conclusions

Income replacement rates may be a helpful gauge for younger workers who have time to contribute more to retirement plans or adjust their saving. They can also be a useful metric for low- and middle-income households that may find they need to plan for replacing a substantial portion of their pre-retirement income in retirement. These households, in particular, may find they need to spend a sizable portion of their retirement income on basic needs, such as housing and health care. Social Security's progressive benefit structure will help these households, but they will need other sources of income in retirement through defined contribution plans, pension benefits, or other means to make up the difference. At the same time, however, reports and articles we reviewed demonstrate that developing a customized replacement rate requires careful consideration to appropriately balance all of the underlying assumptions, including those related to determining pre-retirement and retirement income. The wide range of recommended target replacement rates cited in research indicates that there is no rule-of-thumb that will work for everyone.

Given these factors, workers may have difficulty understanding what target replacement rate to use based on their circumstances. Further, workers may have trouble operationalizing this information into a realistic savings strategy. This difficulty could be compounded by challenges in understanding how to convert defined contribution account balances into a potential income stream. If workers are unable to translate retirement account balances into income replacement goals, the benefit of replacement rates as a metric or guide is limited.

⁵⁵ In 2013, the Advisory Council on Employee Welfare and Pension Benefit Plans, also known as the ERISA Advisory Council, received testimony during 2 days of public hearings on June 6, 2013, and August 27, 2013, on plan communication and design options to increase participant and savings for participants. The Council received testimony from a wide range of representatives including trade and other associations, corporations, service providers, consulting firms, third party administrators, communication companies, and academia. Based on that testimony, the Advisory Council issued a report providing recommendations to DOL of best practices for participant communication and plan design. See Advisory Council on Employee Welfare and Pension Benefit Plans, *Successful Plan Communications for Various Population Segments*, (Washington, D.C.: November 2013).

Despite their complexity, replacement rates are used in some of the retirement planning tools produced by the financial industry to give workers a general sense of their progress toward achieving a secure retirement. DOL's tools, however, lack targeted information and guidance that could help different groups of workers make reasonable adjustments to the replacement rates used in estimating their savings needs. This type of clarifying information is particularly important given the challenges workers may face in understanding the multitude of factors that could affect a target replacement rate. Additionally, DOL's tools do not provide flexibility to allow a user to customize or compare rates. Stating a rule-of-thumb target replacement rate, for example, and then using it in planning tools without an option to adjust it, may inadvertently and implicitly endorse a "right" rate. Without additional information and guidance on how to estimate how much money they will need in retirement and the flexibility to adjust the rate used in the calculations, workers could over- or under-estimate how much they need to save. As a result, they may give up on saving if estimates seem unattainable or they could unknowingly save too little. In both cases, workers could reach retirement without adequate savings.

Recommendations for Executive Action

To help workers make appropriate adjustments to the replacement rates used in calculating their specific retirement income needs, the Secretary of Labor should take the following two actions:

- Include in its retirement planning tools information about examples of individual circumstances that research has shown to result in higher or lower income replacement needs (e.g., household characteristics and income level) and guidance on the direction and magnitude of the changes attributable to such circumstances as well as those due to particular lifestyle choices.
- Modify its retirement planning tools to allow for some user flexibility in adjusting the replacement rate used in calculating retirement income needs.

Agency Comments and Our Evaluation

We provided a draft of this product to the Department of Labor (DOL), Department of the Treasury, Social Security Administration, and Consumer Financial Protection Bureau. DOL provided written comments which are reprinted in appendix VI. DOL also provided technical comments that were incorporated as appropriate. The Social Security Administration (see letter in app. VII), the Department of the Treasury, and the Consumer Financial Protection Bureau did not have any comments on our report.

In its written comments, DOL generally agreed with our findings and recommendations. In its response, DOL cited steps taken by the Employee Benefits Security Administration (EBSA) to ensure that retirement planning materials balance key information with usability of the tools, including working with key stakeholders and experts to develop and test materials. DOL also noted that EBSA has worked to identify the most common circumstances relevant to replacement rates to help make workers aware of the possible impacts, rather than to create an individualized tool. To address our recommendations for providing more information on using replacement rates and modifying tools to allow for more flexibility, EBSA plans to make two changes by June 2017. First, EBSA plans to add an example about replacement rates specifically for married couples. Second, EBSA plans to add options to its online retirement savings rate tool to allow users to adjust their income replacement rate and their Social Security replacement rate within an accepted range. We agree that additional information on using replacement rates and increased user flexibility will further help workers make appropriate adjustments in calculating their specific retirement income needs.

We are sending copies of this report to the appropriate congressional committees, the Secretary of Labor, the Secretary of the Treasury, the Acting Commissioner of the Social Security Administration, and the Director of the Consumer Financial Protection Bureau. In addition, the report is available at no charge on GAO's 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 major contributions to this report are listed in appendix VIII.



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Appendix I: Objectives, Scope, and Methodology

To analyze consumption in retirement and how target replacement rates are defined and used to assess retirement readiness, we examined (1) whether and how spending patterns have varied by age; (2) the key factors used to develop target replacement rates for how much income workers need to replace in retirement; and (3) the usefulness of information on replacement rates provided to workers by the Department of Labor. 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. Each section presents the methods we used for the corresponding objective. Specifically, section I describes the information sources and methods we used to analyze whether and how spending patterns have varied by age. Section II describes the information sources and methods we used to identify key factors used to develop target income replacement rates for retirement. Section III describes the information sources and methods we used to examine the information on replacement rates provided by federal agencies.

Section I: Analyzing Spending Patterns Using Consumer Expenditure Survey Data

Consumer Expenditure Survey

To understand how spending patterns varied by age, we analyzed data from the 2013 Consumer Expenditure Survey (CE). This was the most recently available data at the time of our review. CE is a program that consists of two ongoing surveys, the Quarterly Interview Survey and the Diary Survey, that provide information on the buying habits of American consumers, including data on their expenditures, income, and consumer unit characteristics. The survey data are collected for the Bureau of Labor Statistics (BLS) by the U.S. Census Bureau. Based on our interest in conducting a broad analysis of spending patterns, we chose to use the Interview Survey rather than the Diary Survey, since the Diary Survey is designed to capture information on small, frequently purchased items. In contrast, the Interview Survey is designed to collect data on major items of expense, which respondents can be expected to recall for 3 months or longer. In practice, the Interview Survey collects detailed data on an estimated 60 to 70 percent of total household expenditures. In addition,

global estimates are obtained for food and other selected items, which account for an additional 20 to 25 percent of total expenditures. The Interview Survey does not collect expenses on housekeeping supplies, personal care products, and nonprescription drugs, which contribute about 5 to 15 percent of total expenditures. Thus, up to 95 percent of total expenditures are covered by the Interview Survey.

CE uses a probability sample of households designed to be representative of the total U.S. non-institutionalized civilian population. Prior to 2015, the sampling frame was generated from the 2000 Census of Population. The Interview Survey is a rotating panel survey. According to a BLS official, consumer units in each panel complete four interviews conducted every 3 months and are then dropped. Each month new consumer units enter the survey as other consumer units complete their participation. The quarterly target sample size for the Interview Survey is 7,060 participating sample units. Data are weighted to adjust sample estimates to national population estimates. The results for our weighted data represent approximately 125.7 million households. We also accounted for the number of months a household is interviewed. Sample surveys are subject to two types of errors, sampling and non-sampling. Sampling errors occur because observations are not taken from the entire population. To estimate sampling error, we calculated 95 percent confidence intervals. Total expenditure data estimates reported have 95 percent confidence intervals that are within +/- 17 percent of the estimate itself, and additional confidence interval information on individual spending categories are provided in appendix III. We followed BLS guidance and estimated standard errors using a replicate weight methodology, which involved taking the variance across 44 separate values of differently weighted estimates. Non-sampling error can be attributable to many sources, such as differences in interpreting questions, inability or unwillingness of the respondent to provide correct information, and mistakes in recording or coding data. These non-sampling errors can influence the accuracy of information presented in the report, although the magnitude of their effect is unknown.

We found the 2013 CE Interview Survey data to be reliable for the purposes of our report. To assess reliability, we reviewed survey documentation, compared results to published tables, and interviewed agency officials to ensure the variables we analyzed were reliable for our purposes. Estimates produced in this report may differ from published BLS tables. For our analysis, we only analyzed Interview Survey data, whereas BLS integrates some Diary Survey data into published tables. For the purposes of our analysis, we used different age groups than those

in BLS published tables, which can also account for differences. Additionally, averages for some income and expenditure items in CE publications differ from those derived from Interview Survey public-use microdata because some variables are top coded or suppressed for public-use files.

Cross-Sectional Spending Analysis

We compared estimates for average household spending levels and shares of expenditure categories across 5-year age groups. Expenditure data are tracked for each consumer unit, which can comprise (1) all members of a household related by blood, marriage, or other legal arrangement, (2) a person living alone or sharing a household but who is financially independent, or (3) two or more persons living together who make joint expenditures. For the purposes of this report, we refer to consumer units as households. Households were included in age groups depending on the age of the reference person of the consumer unit. The reference person is the first member mentioned by the respondent when asked to identify the name of the person or one of persons who owns or rents the home.

We defined spending as direct out-of-pocket expenditures. In our analysis, each household had an observation for each expenditure type. Indirect expenditures, which may be significant, may be reflected elsewhere. For example, consumer units with members whose employers pay for all or part of their health or life insurance would have lower direct expenses for these items than those who pay the entire amount themselves. All monthly expenses were summed to obtain quarterly estimates for each household. In cases where no expenditure was reported, the expenditure was coded as a zero. We then multiplied expenditures by four to annualize quarterly expenditure estimates. Households in the four quarters of data were then averaged to obtain annual expenditures. To analyze the shares of different categories of spending, we grouped detailed level expenditures into broader categories, such as health and housing, based on BLS's aggregation method. One exception was that we combined some broad expenditure categories into an "other" category for reporting purposes.

The personal insurance and pensions category includes private pensions. According to BLS officials, private pensions capture contributions to defined benefit, defined contribution, and individual retirement accounts. CE expenditure variables do not include payments on loans, such as principal payments on home mortgages because BLS considers these data as shifts in assets and liabilities, and would be captured in outlays.

Outlays include out-of-pocket expenditures plus spending that “stays within the consumer unit” such as paying down principal on a loan. The figures in this report that are based on our analysis of the Consumer Expenditure Survey reflect data that are defined as expenditures in BLS documentation. However, since mortgages can play an important role in homeownership, we conducted an additional analysis where we added lump sum and mortgage principal payments to housing expenditures to understand the difference between housing outlays and expenditures. We found that including mortgage outlays does not substantially alter the spending patterns observed. For information on home mortgage outlays, see appendix II. Property taxes are included in housing expenditures. Lastly, income tax estimates are separate from expenditure variables. In 2013, CE started using the National Bureau of Economic Research TAXSIM program to estimate tax liabilities because it can be difficult for respondents to accurately recall and estimate income taxes.

We also analyzed expenditure levels by age-specific income quartiles. The income quartile thresholds for each age group are presented in table 6.

Table 6: Age-Specific Income Quartiles, 2013

Age group	Income quartile ranges			
	Lowest income quartile	2nd income quartile	3rd income quartile	Highest income quartile
Under 25	Up to \$7,722	\$7,723-\$19,254	\$19,255-\$38,000	Over \$38,000
25-29	Up to \$23,502	\$23,503-\$42,966	\$42,967-\$68,157	Over \$68,157
30-34	Up to \$29,124	\$29,125-\$52,000	\$52,001-\$85,000	Over \$85,000
35-39	Up to \$31,800	\$31,801-\$57,000	\$57,001-\$95,041	Over \$95,041
40-44	Up to \$34,658	\$34,659-\$63,000	\$63,001-\$105,876	Over \$105,876
45-49	Up to \$33,229	\$33,230-\$65,000	\$65,001-\$106,760	Over \$106,760
50-54	Up to \$27,255	\$27,256-\$59,451	\$59,452-\$101,797	Over \$101,797
55-59	Up to \$28,049	\$28,050-\$57,964	\$57,965-\$101,000	Over \$101,000
60-64	Up to \$22,000	\$22,001-\$50,631	\$50,632-\$92,414	Over \$92,414
65-69	Up to \$20,355	\$22,356-\$39,069	\$39,070-\$70,118	Over \$70,118
70-74	Up to \$18,374	\$18,375-\$30,572	\$30,573-\$55,022	Over \$55,022
75-79	Up to \$16,127	\$16,128-\$26,338	\$26,339-\$46,215	Over \$46,215
80+	Up to \$14,736	\$14,737-\$22,778	\$22,779-\$37,514	Over \$37,514

Source: GAO analysis of 2013 Bureau of Labor Statistics Consumer Expenditure Survey, Interview Survey data. | GAO-16-242

Note: Because the table does not present decimals, the ranges shown may not reflect exact ranges due to rounding.

We also analyzed spending patterns by age for expenditures related to long-term care services since long-term care costs may be a particularly salient issue for older households. Specifically, we looked at spending on long-term care insurance; care in convalescent or nursing home; adult day care; and care for elderly, those who are incapacitated, individuals with disabilities, etc. However, there are challenges with measuring household spending for long-term care because there is uncertainty surrounding the extent to which households will need long-term care services and how they will finance these costs. Since many people may not have spending in this area, average spending levels are not necessarily indicative of the potential costs people may face. Thus, to better understand how long-term care costs would factor into retirement considerations, we compared the results of four academic studies that studied the potential effect of these costs on retirement resources. We selected these articles based on our general literature search results and citations in relevant studies. See appendix V for more information on long-term care costs.

Regression Analysis

Using the same CE Interview Survey data, we analyzed whether there were differences in spending patterns by category using a regression analysis. Specifically, we estimated the following aspects of spending patterns: (1) the age at which the expenditure category is at its maximum, and (2) whether there is a significant relationship between age and expenditures. Our regression model tested the effect of age on expenditures while controlling for education, race, and ethnicity. We used the natural log of expenditures as the dependent variable in order to obtain results for the percentage effect of age on expenditures rather than the absolute effect. Based on the results of our cross-sectional analysis, which showed a parabolic pattern in expenditure levels by age, we used a quadratic form of age. We included a limited set of control variables that were not affected by age so as to capture the effect of age as well as other characteristics that may change with age. Because we used cross-sectional data, the results may not accurately describe how an actual cohort might behave over time.

Our regression model is represented by the following equation:
 $Ln(expenditure) = \alpha + \beta_1*age + \beta_2*age^2 + control\ variables$. We then solved for the age at which expenditure is maximized by taking the first derivative with respect to age, and solving for the age at which the first derivative is equal to zero, $-\beta_1/(2*\beta_2)$.

Section II: Identifying Key Factors Used by Researchers and Financial Professionals to Develop Target Replacement Rates

To identify key factors used to develop target replacement rates, we (1) analyzed articles and reports published in academic journals or by research centers or international organizations and (2) gathered information from financial firms through questionnaires and interviews. To identify the range of target replacement rates recommended to U.S. workers, we catalogued references to such recommendations in the studies we selected for review. Our analysis focused on total replacement rates, that is, the ratio of all income in retirement—including from Social Security, pension benefits, and retirement savings—to pre-retirement earnings. We sought to identify a number of considerations that researchers, policy makers, and financial professionals incorporate into their assumptions when developing, calculating target, or evaluating replacement rates. However, because analyzing the merits and disadvantages of each consideration was outside the scope of our work, GAO is not endorsing any of the considerations presented in this report.

To select articles and reports for our analysis, we used ProQuest, WorldCat, and PolicyFile to search various library databases such as EconLit and ABI/INFORM Global. We also searched the OECD library. We also reviewed websites of research centers and industry organizations that work on retirement security issues, such as the Center for Retirement Research at Boston College, the University of Michigan Retirement Research Center, the Society of Actuaries, the Employee Benefit Research Institute, and the World Bank. We also reviewed written statements of witnesses at congressional hearings held by the House Committee on Ways and Means; House Education and the Workforce Committee; Senate Committee on Finance; Senate Committee on Health, Education, Labor and Pensions; and Senate Special Committee on Aging. Our ProQuest and PolicyFile searches generated 555 results. Our OECD library searches generated 35 results and our web searches generated another 40 results. We reviewed relevant abstracts, when available, to determine which articles (1) contained information on target replacement rates or assumptions needed to calculate a replacement rate and (2) were published in or after 2005, and reviewed those articles. We selected 59 articles and reports for analysis (see bibliography at the end of this report for the list of reports and articles selected). We performed these searches and identified articles from January 2015 through January 2016. We included reports published by international organizations because these reports include detailed information on assumptions and methods used to calculate replacement rates. These reports generally

use replacement rates primarily for cross-country comparisons. For example, the OECD's Pensions Outlook calculates replacement rates for cross-country comparisons.¹ This OECD report considers several definitions of pre-retirement earnings to compute replacement rates and shows the proportion of workers in a given country who may fail to reach the OECD average replacement rate and the country-specific target replacement rate, if any.

To gather information from financial industry firms, we used a combination of questionnaires and interviews. To determine which firms to contact, we relied on suggestions from several researchers and actuaries who have studied replacement rates. We collected information from 14 firms—7 service providers, 3 retirement services consulting firms, and 4 financial planners. While these firms provided valuable insight into target replacement rate recommendations, our findings are nongeneralizable. We asked the firms to respond to a questionnaire we developed, either by completing the questionnaire and sending it back to us or by going through the questionnaire during an interview. The questionnaire asked about how, if at all, the firm uses replacement rates in its work. If the firm uses target replacement rates, we asked a series of questions about the origin of the target rate used by the firm, when and how it was developed, and the various economic and demographic factors considered, if any, when the firm developed the replacement rate. For example, the questionnaire asks about individual or household demographic factors, economic factors specific to an individual or a household, and macroeconomic factors, like inflation and wage growth. If the firm does not use a target replacement rate, we asked about alternative measures it uses in lieu of replacement rates.

To identify target replacement rates recommended to U.S. workers, we reviewed our selected studies for (1) references to rules of thumb for income replacement rates in retirement, (2) references to target rates recommended by other researchers or organizations, and (3) target replacement rates recommended or developed by the report's authors. For this particular part of analysis, we excluded articles and reports written by international organizations because of our focus on recommendations for U.S. workers.

¹ OECD, *OECD Pensions Outlook 2014* (Paris, France: OECD Publishing, 2014).

Section III: Assessing the Usefulness of Information on Replacement Rates Provided by Federal Agencies to Workers

To identify the information on replacement rates provided to workers by federal agencies, we interviewed officials and reviewed relevant retirement planning materials produced by the Department of Labor (DOL), the Social Security Administration (SSA), and the Consumer Financial Protection Bureau (CFPB). We also interviewed officials at all three agencies. In addition to reviewing documents provided to us by agency officials, we conducted web searches to identify any additional relevant materials. We also reviewed the websites of the Pension Benefit Guaranty Corporation, the Securities and Exchange Commission, and the Administration on Aging for retirement planning documents that might contain references to replacement rates. We included these agencies because of references we found in DOL and SSA retirement planning materials. Although we found references to replacement rates in SSA and CFPB documents, we focused our review on DOL materials as DOL is required by law to provide a means of calculating retirement savings needs using a replacement rate.² We also reviewed relevant federal laws and regulations.

To assess information on replacement rates provided to workers by federal agencies, we reviewed best practices for financial literacy and financial planning. We found practices related to federal plain language writing requirements and ensuring that financial planning tools account for differences in individual circumstances. To identify these best practices, we used web searches, interviewed academic researchers about the advantages and disadvantages of target replacement rates, and analyzed financial industry professionals' views on replacement rates from interviews, questionnaires, and sample materials. We also reviewed public comments in response to DOL's Employee Benefits Security Administration's 2010 Request for Information Regarding Lifetime Income Options for Participants and Beneficiaries in Retirement Plans³ and 2013 Advanced Notice of Proposed Rulemaking on Pension Benefit Statements⁴ for remarks specific to the provision of information about replacement rates or pension benefits in individual benefit statements.

² See 29 U.S.C. § 1146(d).

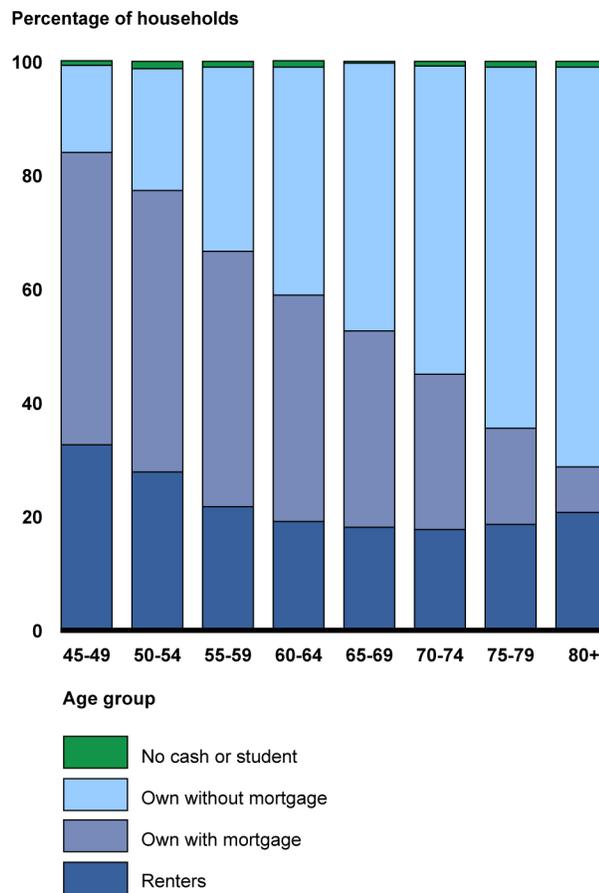
³ See 75 Fed. Reg. 5253 (Feb. 2, 2010).

⁴ See 78 Fed. Reg. 26,727 (May 8, 2013).

Appendix II: Home Mortgage Outlays

Housing is unique from most spending categories in that certain financial aspects of homeownership are considered an asset for households, and financing plays an important role in purchasing a home. For several age groups, we found that a large portion of households owned a home with a mortgage (see fig. 7).

Figure 7: Housing Status, 2013



Source: GAO analysis of 2013 Bureau of Labor Statistics Consumer Expenditure Survey, Interview Survey data. | GAO-16-242

Notes: The "no cash or student" category represents housing that is occupied as student housing or without payment of cash rent. The percentage of households in this category for all age groups over 45 was around 1 percent or less.

While certain out-of-pocket expenses associated with homeownership, such as mortgage interest payments and property taxes, are captured by the Consumer Expenditure Survey (CE) expenditure variables, mortgage principal payments are not included in expenditures.¹ Rather, payments of mortgage principal are considered a shift in a household’s assets and liabilities. To get a sense of the household’s total outlays for housing, we conducted an additional analysis of 2013 CE data on owned and vacation home mortgage principal and lump sum payments, referred to here as mortgage outlays. When mortgage outlays were added to housing expenditures, the share of spending on housing increased somewhat (see table 7).

Table 7: Estimated Average Annual Housing Expenditures and Mortgage Outlays by Age, 2013

Age group	Housing expenditures only	Share of total spending	Mortgage outlays	Share of total spending with mortgage outlays
45-49	\$18,360	31%	\$2,942	35%
50-54	\$17,285	31%	\$3,170	35%
55-59	\$17,246	31%	\$2,754	35%
60-64	\$16,364	31%	\$2,763	35%
65-69	\$15,191	32%	\$2,850	36%
70-74	\$13,296	33%	\$1,350	35%
75-79	\$11,379	33%	\$839	34%
80+	\$11,331	36%	\$392	37%

Source: GAO analysis of 2013 Bureau of Labor Statistics Consumer Expenditure Survey, Interview Survey data. | GAO-16-242

Notes: “Housing expenditures only” include expenses such as rent, utilities, and mortgage interest payments, but do not include mortgage principal payments. “Mortgage outlays” represent mortgage principal and lump sum payments for owned and vacation homes. Age groupings are based on the age of the reference person, or the person who rents or owns the home, for the consumer unit. There may be adults in the consumer unit who are older or younger than the reference person. A consumer unit can comprise (1) all members of a household related by blood, marriage, or other legal arrangement, (2) a person living alone or sharing a household but who is financially independent, or (3) two or more persons living together who make joint expenditures. For the purposes of this report, we refer to consumer units as households. We did not adjust spending levels for household size.

Mortgage outlays were larger for some age groups than others. For example, estimated average mortgage outlays were around \$3,000 for mid-career households (aged 45-49). However, for some age groups, such as households aged 75 and older, average mortgage outlays were

¹Housing expenditures also include utilities and maintenance costs, as well as household operations expenses, such as child care and housekeeping.

quite small.² While mortgage principal payments are an important expense for some households, their inclusion does not substantially alter the spending patterns observed. More specifically, housing was a major household expense across all age groups regardless of whether or not mortgage outlays are included.

² The 95 percent confidence intervals for mortgage outlays are between \$2,635 and \$3,249 for households aged 45-49, between \$541 and \$1,136 for households aged 75-79, and between \$230 and \$554 for households aged 80 and older.

Appendix III: Confidence Intervals for Select Spending Estimates

The tables below provide the underlying spending estimates and confidence intervals for table 1, table 2, and figure 2.

Table 8: Comparison of Estimated Average Annual Household Expenditures across Pre- and Post-Retirement Age Groups, 2013 with Confidence Intervals

Expenditure type	Average household expenditures		Ratio of expenditures
	Pre-retirement (50-64) <i>(95% confidence interval)</i>	Post-retirement (65-79) <i>(95% confidence interval)</i>	Comparing ages 65-79 to 50-64 <i>(95% confidence interval)^a</i>
Housing	\$16,998 (+/- \$557)	\$13,699 (+/- \$728)	81% (+/- 6)
Transportation	\$9,557 (+/- \$561)	\$7,113 (+/- \$660)	74% (+/- 9)
Food	\$7,703 (+/- \$198)	\$6,420 (+/- \$231)	83% (+/- 4)
Personal insurance and pensions	\$7,154 (+/- \$343)	\$2,839 (+/- \$436)	40% (+/- 6)
Health	\$3,935 (+/- \$181)	\$4,959 (+/- \$190)	126% (+/- 8)
Entertainment	\$2,317 (+/- \$112)	\$2,008 (+/- \$219)	87% (+/- 10)
Apparel	\$1,124 (+/- \$70)	\$751 (+/- \$81)	67% (+/- 8)
Other	\$5,567 (+/- \$480)	\$4,115 (+/- \$566)	74% (+/- 13)
Total	\$54,356 (+/- \$1,647)	\$41,904 (+/- \$2,343)	77% (+/- 6)

Source: GAO analysis of 2013 Bureau of Labor Statistics Consumer Expenditure Survey, Interview Survey data. | GAO-16-242

Notes: Age groupings are based on the age of the reference person, or the person who rents or owns the home, for the consumer unit. There may be adults in the consumer unit who are older or younger than the reference person. A consumer unit can comprise (1) all members of a household related by blood, marriage, or other legal arrangement, (2) a person living alone or sharing a household but who is financially independent, or (3) two or more persons living together who make joint expenditures. For the purposes of this report, we refer to consumer units as households. We did not adjust spending levels for household size. The "other" category of spending includes expenditures for reading, tobacco, alcoholic beverages, education, cash contributions, personal care, and miscellaneous expenses. The "personal insurance and pensions" category includes deductions for government and railroad retirement, private pensions, and Social Security. According to Bureau of Labor Statistics officials, the private pensions category includes defined benefit, defined contribution, and individual retirement accounts. Housing expenditures include expenses such as rent, utilities, and mortgage interest payments, but do not include payments on mortgage principal.

^aRatio estimate confidence intervals are provided in percentage points.

Appendix III: Confidence Intervals for Select Spending Estimates

Table 9: Estimated Average Annual Household Expenditures and Shares for Select Age Groups, 2013

Expenditure type	Average household expenditures and share of total spending			
	Mid-career (45-49) (95% confidence interval)	Young retirees (65-69) (95% confidence interval)	Mid-retirees (75-79) (95% confidence interval)	Older retirees (80+) (95% confidence interval)
Housing	\$18,360 (+/- \$890) 31%	\$15,191 (+/- \$1,127) 33%	\$11,379 (+/- \$1,040) 33%	\$11,331 (+/- \$722) 36%
Transportation	\$10,230 (+/- \$890) 18%	\$7,851 (+/- \$817) 17%	\$5,904 (+/- \$1,098) 17%	\$3,576 (+/- \$700) 11%
Food	\$8,489 (+/- \$282) 15%	\$6,885 (+/- \$302) 15%	\$5,644 (+/- \$389) 16%	\$4,755 (+/- \$255) 15%
Personal insurance and pensions	\$7,815 (+/- \$585) 13%	\$4,099 (+/- \$737) 9%	\$1,307 (+/- \$465) 4%	\$872 (+/- \$277) 3%
Health	\$3,546 (+/- \$219) 6%	\$4,913 (+/- \$252) 11%	\$4,839 (+/- \$366) 14%	\$4,666 (+/- \$379) 15%
Entertainment	\$2,957 (+/- \$372) 5%	\$2,442 (+/- \$470) 5%	\$1,441 (+/- \$145) 4%	\$1,081 (+/- \$120) 3%
Apparel	\$1,412 (+/- \$136) 2%	\$887 (+/- \$133) 2%	\$545 (+/- \$120) 2%	\$384 (+/- \$54) 1%
Other	\$5,643 (+/- \$763) 10%	\$4,524 (+/- \$889) 10%	\$3,636 (+/- \$791) 10%	\$4,730 (+/- \$1,224) 15%
Total	\$58,452 (+/- \$2,438)	\$46,791 (+/- \$3,205)	\$34,695 (+/- \$2,827)	\$31,395 (+/- \$2,627)

Source: GAO analysis of 2013 Bureau of Labor Statistics Consumer Expenditure Survey, Interview Survey data. | GAO-16-242

Notes: Age groupings are based on the age of the reference person, or the person who rents or owns the home, for the consumer unit. There may be adults in the consumer unit who are older or younger than the reference person. A consumer unit can comprise (1) all members of a household related by blood, marriage, or other legal arrangement, (2) a person living alone or sharing a household but who is financially independent, or (3) two or more persons living together who make joint expenditures. For the purposes of this report, we refer to consumer units as households. We did not adjust spending levels for household size. The "other" category of spending includes expenditures for reading, tobacco, alcoholic beverages, education, cash contributions, personal care, and miscellaneous expenses. The "personal insurance and pensions" category includes deductions for government and railroad retirement, private pensions, and Social Security. According to Bureau of Labor Statistics officials, the private pensions category includes defined benefit, defined contribution,

**Appendix III: Confidence Intervals for Select
Spending Estimates**

and individual retirement accounts. Housing expenditures include expenses such as rent, utilities, and mortgage interest payments, but do not include payments on mortgage principal.

Table 10: Estimated Average Annual Household Housing Expenditures and Housing Status 2013 with Confidence Intervals

Age group	Average housing expenditure (95% confidence interval)	% Renter (95% confidence interval)^a	% Own with mortgage (95% confidence interval)^a	% Own without mortgage (95% confidence interval)^a	% No cash or student (95% confidence interval)^a
45-49	\$18,360 (+/- \$890)	33 (+/-3)	51 (+/-3)	15 (+/-3)	1 (+/-0)
50-54	\$17,285 (+/- \$902)	28 (+/-3)	50 (+/-4)	21 (+/-3)	1 (+/-1)
55-59	\$17,246 (+/- \$1,167)	22 (+/-3)	45 (+/-3)	32 (+/-3)	1 (+/-1)
60-64	\$16,364 (+/- \$842)	19 (+/-2)	40 (+/-3)	40 (+/-3)	1 (+/-1)
65-69	\$15,191 (+/- \$1,127)	18 (+/-3)	35 (+/-4)	47 (+/-4)	0 (+/-0)
70-74	\$13,296 (+/- \$1,085)	18 (+/-3)	27 (+/-4)	54 (+/-3)	1 (+/-1)
75-79	\$11,379 (+/- \$1,040)	19 (+/-3)	17 (+/-3)	64 (+/-4)	1 (+/-1)
80+	\$11,331 (+/- \$722)	21 (+/-3)	8 (+/-2)	70 (+/-3)	1 (+/-1)

Source: GAO analysis of 2013 Bureau of Labor Statistics Consumer Expenditure Survey, Interview Survey data. | GAO-16-242

Notes: Age groupings are based on the age of the reference person, or the person who rents or owns the home, for the consumer unit. There may be adults in the consumer unit who are older or younger than the reference person. A consumer unit can comprise (1) all members of a household related by blood, marriage, or other legal arrangement, (2) a person living alone or sharing a household but who is financially independent, or (3) two or more persons living together who make joint expenditures. For the purposes of this report, we refer to consumer units as households. We did not adjust spending levels for household size. Housing expenditures include expenses such as rent, utilities, and mortgage interest payments, but do not include payments on mortgage principal. For more information on mortgage principal, see appendix II. The "no cash or student" category represents housing that is occupied as student housing or without payment of cash rent. Percentages may not add to 100 percent due to rounding.

^aPercent estimate confidence intervals are provided in percentage points.

Appendix IV: Other Factors That Could Inform Target Replacement Rates

We identified four factors from the articles and reports we reviewed in addition to spending, household characteristics, and pre-retirement earnings that raised important considerations for developing the underlying assumptions behind a target replacement rate. As shown in table 11, these four factors are (1) the income to be replaced, (2) sources of income in retirement, (3) saving patterns, and (4) risks.

Table 11: Additional Considerations That Could Inform the Development of a Target Replacement Rate

Income to be replaced	<p>A target replacement rate could be designed to replace gross or after-tax income.</p> <p>How much pre-retirement income an individual needs to replace in retirement may change throughout retirement. Replacement rates could be for a broad “retirement average” time period rather than a single point in time—for example, at retirement—because retirement income varies over time. Alternatively, target replacement rates could be calculated for different points in retirement. For example, there could a target rate for how much income needs to be replaced immediately at retirement and then a different target for 10 years into retirement. Income may vary for a number of reasons. For example, if members of a couple retire at different times, the retirement income they receive will be different in the years where only one member of the couple is retired compared to years when both members are retired. In addition, if a retiree has a pension benefit that is not indexed to inflation, or has converted some or all of his or her defined contribution savings to a non-inflation indexed annuity, the real value of income from these benefits or annuities will erode over time. Further, with the shift from defined benefit to defined contribution plans, and a high level of aversion to annuitizing defined contribution savings, there may be more unpredictability in how much income a household will have in any particular year.</p> <p>Women tend to have lower earnings over the course of their careers. As a result, they may need to replace more income to maintain their standard of living in retirement.</p> <p>What non-earnings sources, if any, should be replaced? Non-earnings sources of income could include government transfers such as social assistance, unemployment insurance, and capital income, such as interest on investments or imputed rent from housing.</p>
Sources of income in retirement	<p>In addition to Social Security, pension benefits, and retirement savings, households may also have non-retirement savings or assets. These assets could be converted into an income stream in retirement. However, one researcher recommends not including sources like inheritances because they are not related to the retirement system or pre-retirement income.</p> <p>Some of the financial aspects of home ownership could be considered income sources. For example, researchers have raised the question of whether imputed rent could be considered income. Alternatively, an individual could convert their housing equity into a reverse mortgage, providing an additional income stream.</p> <p>Outside of the tax-qualified plan environment, retail annuity rates for women are typically less generous than for men because women have a longer average life expectancy. According to DOL, annuities offered within a pension plan must be offered on a gender neutral basis. However, 401(k) plans do not typically offer a lifetime annuity option within the plan. Women face the risk of receiving less generous income streams if they annuitize their 401(k) balances outside the plan, and they face a higher risk of outliving their assets if they do not annuitize their balances. Depending on how a replacement rate is constructed, women may need a higher replacement rate than men to account for these risks.</p>
Saving patterns	<p>After retirement, the need to save for retirement is reduced or eliminated. Any income devoted to saving for retirement does not need to be replaced.</p>

**Appendix IV: Other Factors That Could Inform
Target Replacement Rates**

Those who save less prior to retirement will need a higher replacement rate because more of their pre-retirement income will have gone towards spending. For example, retirees with a defined benefit plan may need a higher replacement rate. They likely saved less before retirement, and thus, do not have the same gain from a decline in saving upon retirement as workers who have saved in a defined contribution account.^a

Risks

Target replacement rate assumptions, even after taking into account the considerations raised in this report, still may not incorporate a variety of post-retirement risks including accelerating inflation, death of a spouse, divorce, insurer default, low investment returns, annuitization rates, longevity, developing a health condition with significant out-of-pocket expenses, tax increases, and changes in pension or Social Security benefits.

Source: GAO analysis of articles and reports discussing income replacement rates in retirement. | GAO-16-242

Notes: We sought to identify a number of considerations that researchers, policy makers, and financial professionals could incorporate into their assumptions when calculating target replacement rates. However, GAO is not endorsing any of the considerations presented in this report.

^aIndividuals will need to take into account whether their retirement savings are in tax-deferred or after-tax accounts when planning for retirement. Often, participants have tax-deferred accounts and the balances they see on account statements do not account for taxes that will be owed when a retiree begins withdrawing funds from these accounts. Thus, the full amounts are not available for consumption spending.

Appendix V: Long-term Care Costs and Effect on Retirement Resources

Based on the studies we reviewed in table 12, long-term care (LTC) is an important consideration for retirement, particularly since a majority of users for these services are elderly.¹ About 70 percent of those aged 65 and older are likely to need long-term services and supports at some point in their lives.² However, it is difficult to plan for LTC costs as part of income replacement in retirement because of challenges in determining spending needs, high service rates,³ and limited government coverage for financing costs. Average LTC spending is not necessarily indicative of the potential costs individuals may face because the distribution of costs is skewed. While many may not require LTC services, those who do may have significant spending. For example, in our analysis of 2013 Consumer Expenditure Survey data, we found that only 3 percent of households we analyzed had out-of-pocket spending on LTC-related expenses. Estimated expenditures were sizeable in some age groups for those who had spending on these services. For example, households aged 80 and older that did have long-term care expenses spent an average of about \$6,900 in 2013.⁴ Further, LTC service rates can be expensive. According to 2015 Genworth Cost of Care Survey data, the national median annual service rate for nursing homes was \$80,000 and was \$46,000 for full-time home health care. Although government programs can help individuals finance LTC costs, coverage from these programs is limited. For example, Medicaid does provide coverage for some long-term care services, but coverage is limited to individuals who are within certain eligibility categories and meet functional and financial criteria. Individuals who pay for an extended stay in a nursing home can quickly deplete their resources for retirement and subsequently qualify for Medicaid.

¹According to a National Health Care Statistics report, data from 2011 and 2012 indicate that about 7 million people were served by nursing homes, residential care communities, home health agencies, and adult day services. See National Center for Health Statistics, *Long-Term Care Services in the United States: 2013 Overview*, National Health Care Statistics Reports, no. 1 (Hyattsville, MD: 2013).

²Peter Kemper, Harriet L. Komisar and Lisa Alecxih, "Long-Term Care Over an Uncertain Future: What Can Current Retirees Expect?" *Inquiry*, vol. 42, Winter 2005/2006 (2005).

³Service rates refer to how much providers charge for long-term care services.

⁴The 95 percent confidence interval for average spending on long-term care services for households aged 80 and older that had these expenses is between \$4,683 and \$9,014.

To understand how the potential for LTC costs affects retirement adequacy, we reviewed four academic studies (see table 12). The results show that incurring long-term care costs can have a negative impact on retirement readiness, particularly for low- and middle-income households.

Table 12: Studies Analyzing the Effects of Long-term Care Costs on Retirement

Organization	Modeling methodology	Examples of effect on retirement resources
Center for Retirement Research at Boston College (2009)	This study analyzes the impact of strategies for covering long-term care costs on the National Retirement Risk Index (NRRRI) benchmark to show how the potential for long-term care expenditures affects households' ability to maintain their pre-retirement non-health-related spending. The strategies used to demonstrate the potential for long-term care costs are purchasing long-term care insurance and not having a reverse mortgage, so that home equity is available to finance long-term care.	<p>The results show how the NRRRI is affected by incorporating potential long-term care costs. The NRRRI shows the percentage of households that are at risk of not being within 10% of their target replacement rate when long-term care is and is not incorporated:</p> <ul style="list-style-type: none"> • Original NRRRI (long-term care not incorporated): 44% of households • NRRRI with cost of long-term care insurance: 64% of households • NRRRI without reverse mortgages (equity is available to finance long-term care costs): 65% of households
Employee Benefit Research Institute (2006)	For various stylized examples, this paper simulates the replacement rates necessary to provide adequate retirement resources at different probability levels to account for investment, longevity, and long-term health care risks.	<p>The results show how the replacement rates associated with having a 90% probability of adequate resources are affected when long-term health care risks are incorporated into the simulations. Results are shown for a hypothetical worker.</p> <p><u>Low-income male retiring at age 65 with no equity allocation and no annuity</u></p> <ul style="list-style-type: none"> • Replacement rate without stochastic long-term health care costs: 241% • Replacement rate with stochastic long-term health care costs: 394%
Employee Benefit Research Institute (2014)	This purpose of this study is to show results for the probability of not running short of money in retirement. This study uses a model to simulate the percentage of the population at risk of not having retirement income adequate to cover average expenses and uninsured health costs. Longevity, investment, and stochastic long-term health care risks were incorporated into the model similar to the approach in EBRI's 2006 work.	<p>This study uses the retirement readiness rating (RRR) as a benchmark to compare results between those who do and do not incur long-term health care costs at various income levels. The RRR is equal to the percentage of simulated life paths that do not run short of money in retirement, and are shown below for the various scenarios:</p> <p><u>Lowest income quartile</u></p> <ul style="list-style-type: none"> • RRR without long-term care costs: 38.9% • RRR with long-term care costs: 10.6% <p><u>2nd income quartile</u></p> <ul style="list-style-type: none"> • RRR without long-term care costs: 89.2% • RRR with long-term care costs: 42.3%

**Appendix V: Long-term Care Costs and Effect
on Retirement Resources**

Organization	Modeling methodology	Examples of effect on retirement resources
Society of Actuaries (2014)	This study simulates the retirement wealth needed to be sufficient for meeting household needs at the 50th and 95th percentiles across stylized examples across two income levels. Long-term care risk is defined as events that require institutional care and assumes that long-term care insurance only covers this type of care. Probability of needing care is based on age and gender, and the length of care is either 3 months or life.	<p>This study uses the level of wealth that is sufficient to maintain standard of living in retirement without running out of investment wealth and without having to sell home (except where the second spouse enters permanent long-term care and the home is no longer needed) as a benchmark. The difference between the 50th and 95th percentile success levels of having sufficient wealth shows the combination of the effects of investment, inflation, health, longevity, and long-term care risks on retirement resources.</p> <p><u>Results for 50th income percentile, couple with no long-term care insurance</u></p> <ul style="list-style-type: none"> • Sufficient wealth for 50th percentile success level: \$169,628 • Sufficient wealth for 95th percentile success level: \$686,264

Source: GAO analysis of the following research papers: Alicia H. Munnell, Anthony Webb, Francesca Golub-Sass, and Dan Muldoon, "Long-Term Care Costs and the National Retirement Risk Index," *Center for Retirement Research at Boston College*, no. 9-7 (March 2009); Jack VanDerhei, "Measuring Retirement Income Adequacy: Calculating Realistic Income Replacement Rates," *Employee Benefit Research Institute Brief*, no. 297 (September 2006); Jack VanDerhei, "What Causes EBRI Retirement Readiness Ratings to Vary: Results from the 2014 Retirement Security Projection Model," *Employee Benefit Research Institute Brief*, no. 396 (February 2014); Vickie Bajtelsmit and Anna Rappaport, *The Impact of Long-Term Care Costs on Retirement Wealth Needs* (Washington, D.C.: Society of Actuaries, 2014). | GAO-16-242

Appendix VI: Comments from the Department of Labor

U.S. Department of Labor

Assistant Secretary for
Employee Benefits Security Administration
Washington, D.C. 20210



FEB 17 2016

Charles A. Jeszeck
Director, Education, Workforce, and Income Security
United States Government Accountability Office
Washington, DC 20548

Dear Mr. Jeszeck:

Thank you for the opportunity to review the Government Accountability Office's (GAO) draft report entitled "Retirement Security: Better Information on Income Replacement Rates Needed to Help Workers Plan for Retirement" (GAO-16-242). We share your concerns that many of America's workers are not better prepared for a secure retirement.

EBSA strongly believes in the importance of retirement savings education. We launched our Saving Matters Campaign over 20 years ago. As reported, Congress later mandated that we continue our education program under the SAVER Act. We continue our retirement savings education activities, not only through the publications and online tools the report notes, but also with in-person workshops, webcasts, videos as well as our work with key partners such as the Certified Financial Planner Board of Standards, the Social Security Administration, the Centers for Medicare and Medicaid Services, AARP and the American Libraries Association.

EBSA appreciates the thoroughness with which you prepared your report, and is carefully considering your recommendations. EBSA always strives to present information in a way that maximizes usability, readability and accuracy. This is why EBSA worked with professional financial writers, focus groups consisting of the target audience, financial planners and subject matter experts to develop publications that balance key information that workers need to know to do the replacement rate calculation and start saving, while not overwhelming them so they fail to complete the calculation. As part of this effort, EBSA tested versions of the publications that included more information on specific circumstances that impact retirement savings, offered more examples and provided more options for calculations. The feedback from all stakeholders (target audience, professional writers, and subject matter experts) was that the additional information made the educational publications and tools too long, appear too complicated and, most importantly, impacted the usability.

In preparing the current publications and tools, EBSA identified the most common circumstances that may be relevant to retirement replacement rates to make the workers aware of the possible impacts, rather than create a much more individualized tool that accounts for a wider range of

circumstances. As EBSA noted, the replacement rate is an estimate that can help readers start thinking about retirement needs. For an audience that has not taken the steps to calculate a retirement replacement rate, it will help give them a better idea of their goal. For the workers that may be more advanced in their retirement planning, EBSA included additional resources to help people looking for more assistance.

With respect to your first recommendation that DOL provide additional examples on using a replacement rate for estimating retirement needs, EBSA will add an example specifically for married couples by June 2017. With respect to your second recommendation to allow more user flexibility in adjusting the replacement rate, EBSA will add more options to the online target retirement savings rate tool to allow users to adjust the income replacement rate as well as the Social Security replacement rate within a generally accepted range. EBSA believes this can be done by June 2017 without making the tool too complicated.

In conclusion, we appreciate GAO's interest in helping America's workers save adequately for retirement. We look forward to continuing to work together to improve workers' future financial security.

Sincerely,



Phyllis C. Borzi

Appendix VII: Comments from the Social Security Administration



SOCIAL SECURITY
Office of the Commissioner

February 10, 2016

Mr. Charles Jeszeck
Education, Workforce,
and Income Security Issues
United States Government Accountability Office
441 G. Street, NW
Washington, DC 20548

Dear Mr. Jeszeck:

Thank you for the opportunity to review the draft report, "RETIREMENT SECURITY: Better Information on Income Replacement Rates Needed to Help Workers Plan for Retirement" (GAO-16-242). We have no comments.

If you have any questions, please contact me at (410) 965-0520. Your staff may contact Gary S. Hatcher, Senior Advisor for the Audit Liaison Staff, at (410) 965-0680.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Frank Cristaudo'.

Frank Cristaudo
Executive Counselor to the Commissioner

SOCIAL SECURITY ADMINISTRATION BALTIMORE, MD 21235-0001

Appendix VIII: GAO Contact and Staff Acknowledgments

GAO Contact

Charles A. Jeszeck, (202) 512-7215 or jeszeckc@gao.gov

Staff Acknowledgments

In addition to the contact named above, Kimberley Granger (Assistant Director), Jennifer Gregory (Analyst in Charge), Mindy Bowman, and Amrita Sen made key contributions to this report. Also contributing to this report were Benjamin Bolitzer, David Chrisinger, John Dicken, Gustavo Fernandez, Alexander Galuten, Mark Glickman, Isabella Johnson, Kathy Leslie, Mimi Nguyen, Oliver Richard, Frank Todisco, Walter Vance, and Seyda Wentworth.

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