

# WHAT IS THE DISTRIBUTION OF LIFETIME HEALTH CARE COSTS FROM AGE 65?

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## Introduction

Medical and long-term care costs represent a substantial uninsured risk for most retired households. In 2007, spending on Medicare premiums and co-payments among married couples age 65 and over averaged \$7,600.<sup>1</sup> But such statistics are of limited value to households trying to determine how much to set aside for health care costs in retirement or how to manage wealth decumulation during retirement. Households care not only about average costs, but also about the risk of incurring unusually high costs. Furthermore, calculations of the distribution of health care costs incurred by households in any particular year tell us little about lifetime risk unless we also know the extent to which the same individuals are incurring high health care costs every year.

This *brief* outlines the findings of new research that calculates the distribution of lifetime health care costs.<sup>2</sup> The research shows that the expected present value of lifetime uninsured health care costs for a typical married couple age 65 is about \$197,000<sup>3</sup> – including insurance premiums, out-of-pocket costs, and home health costs and excluding nursing home care.<sup>4</sup> But a typical household has a 5-percent risk that the present value of its lifetime uninsured health care costs will exceed \$311,000. And when nursing home costs are included, the amount for a typical couple increases from \$197,000 to \$260,000, with

a 5-percent risk of exceeding \$570,000. Even at the peak of the stock market in 2007, less than 15 percent of households approaching retirement had accumulated that much in *total* financial assets, much less financial assets available for health care costs.<sup>5</sup>

## What We Already Know About Health Care Cost Risk

The major health care expenses retired households face include premiums for Medicare Part B (which covers physician and outpatient services) and Part D (which covers drug-related expenses); Medigap and retiree health insurance premiums;<sup>6</sup> co-payments related to Medicare covered services for those whose expenditures are not fully covered by Medigap or retiree health insurance; and health care services – such as dental care, eyeglasses, and hearing aids – that are not covered by Medicare or other insurance.

Medicare Part B and Part D premiums are taken out of an individual's Social Security check before it goes in the mail. And although Medigap and retiree health insurance premiums can absorb a substantial part of retirees' incomes, they can be budgeted for and decrease rather than increase overall health care cost risk.

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\* Anthony Webb is associate director for research at the Center for Retirement Research at Boston College (CRR). Natalia Zhivan is a consultant for the CRR. The CRR gratefully acknowledges Prudential Financial for its generous support of this research. The findings and conclusions expressed are solely those of the authors and do not represent the opinions or policy of Prudential Financial or the Center for Retirement Research at Boston College. This *brief* is adapted from a [longer paper](#) (Webb and Zhivan, 2010).

The main sources of retired households' health care cost risk are co-payments for Medicare-covered services and payments for non-covered services. Long-term care costs – for nursing home care in particular – can be quite significant. About one-third of individuals turning 65 in 2010 will need at least three months of nursing home care, 24 percent more than a year, and 9 percent more than five years.<sup>7</sup> Paid long-term care is very expensive. In 2008, the annual cost of a nursing home was about \$71,000 for a semi-private room and \$79,000 for a private room.<sup>8</sup> Alternatively, employing a home health aide for four hours a day, five days a week costs about \$22,000 a year. Medicare pays for a maximum of only 100 days of nursing home care. Medicaid support for long-term care is subject to strict income and asset tests that vary by state. Therefore, the cost of long-term care represents a substantial financial risk for all but the poorest households.

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*Nursing home care is the real wild card in assessing potential health care costs.*

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## Calculating the Distribution of Lifetime Health Care Costs

The distribution of health care costs incurred by households in a single year provides little information about lifetime risk. Lifetime risk depends on whether it is the same or different households that are incurring high health care costs in successive years.<sup>9</sup> One way of quantifying lifetime risk would be to use a panel micro data set to track annual out-of-pocket health care expenditure from age 65 until death, and then calculate the age 65 present value of each individual's lifetime expenditure. Unfortunately, the data set best suited for this purpose, the *Health and Retirement Study* (HRS) (a nationally representative sample of older Americans), has a maximum of only 16 years of data so that only a small and unrepresentative proportion of individuals age 65 at baseline has died. Therefore, we adopted an alternative approach, namely to use data from the HRS to create a large number of simulated lifetime health care cost histories for each HRS household observed at age 65.<sup>10</sup>

In each simulation, the members of the household experience the onset of various chronic diseases (diabetes, cancer, lung disease, heart disease, and stroke), enter nursing homes, and eventually die. The

probabilities of these events are calibrated to match those observed in the HRS data, and vary with gender and socioeconomic status. Health care costs, which are also calibrated to the HRS data, vary with age, health, and socioeconomic status, and with whether the individual is covered by Medigap or retiree health insurance and whether the individual is in a nursing home.<sup>11</sup> Costs include a random component, reflecting persistent individual-level variations in health expenditure, even after controlling for disease and

socioeconomic status.<sup>12</sup> The simulated health care cost data are then used to calculate the distribution of lifetime health care costs, given

the household's socioeconomic status, initial health, and insurance coverage.

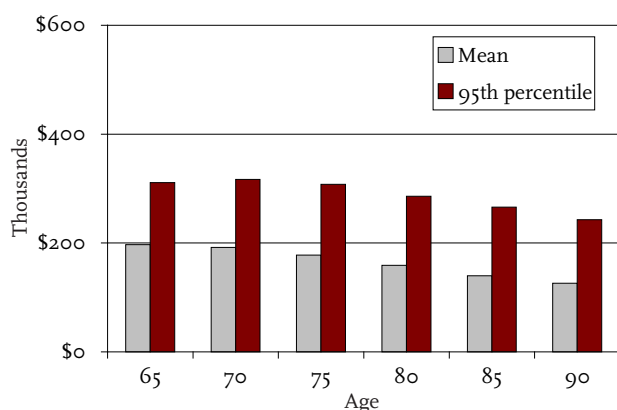
Over the period 1960-2007, per-capita health expenditure has increased at an average rate of 4.2 percent a year, adjusted for inflation.<sup>13</sup> This rate is higher than the 3.2 to 3.5 percent rate projected by the Centers for Medicare and Medicaid Services (2007) for the period 2007-2027 under the alternative assumptions that the physician payment schedule stays constant in real terms or increases at 2 percent a year. But the Congressional Budget Office considers it more reasonable to assume that the growth in health care expenditure for the next decade will continue at the average for the past three decades.<sup>14</sup> Moreover, individuals face the additional risk that health care expenditure will grow even faster than projected. The rate of growth is therefore allowed to vary from simulation to simulation, the degree of variation reflecting the variability in the rate of growth of health care costs over the period 1960-2007.<sup>15</sup>

The simulated health-care-cost histories are based on the assumption that households are not subject to substantial constraints regarding the amount of their expenditure.<sup>16</sup> In practice, households are constrained by their financial resources, and they may also restrict their spending – for example, by delaying filling prescriptions or foregoing medical checkups – even before exhausting their wealth. Even so, a sizeable minority may end up on Medicaid. The objective of the analysis is not to calculate how much households spend on health care in practice – or even how much households should optimally choose to set aside to cover health care costs – but to quantify the magnitude and distribution of the potential lifetime expenditure.<sup>17</sup>

## Results

Figure 1 shows the mean and 95th percentile of remaining lifetime health care costs at selected ages, excluding nursing home costs, for a typical high-school-educated married couple free of chronic diseases at age 65, under the assumption that the couple never becomes eligible for Medicaid.<sup>18</sup> The first two bars show the mean and 95th percentile of lifetime health care costs from age 65 for such a household in 2009. The subsequent bars show what happens to the costs for this type of household as it ages. Over a large number of simulations, the average expenditure amounts to \$197,000 for the 65-year-old household.<sup>19</sup> But in 5 percent of the simulations, the expenditure exceeds \$311,000.

FIGURE 1. MEAN AND 95TH PERCENTILE OF REMAINING LIFETIME HEALTH CARE COSTS EXCLUDING NURSING HOME CARE, AT SELECTED AGES



Note: The above costs are in 2009 dollars and are projected for households turning 65 in that year. Increases in medical costs are projected to place subsequent birth cohorts at greater risk.

Source: Webb and Zhivan (2010).

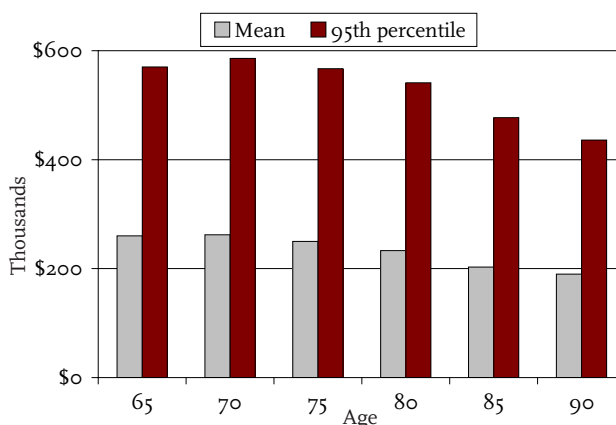
The third and fourth bars show the mean and 95th percentile of remaining lifetime health care costs from age 70, discounted back to age 70, for a household in which both husband and wife survive to age 70. As this household is now five years older, it no longer has to worry about health care expenditures between age 65 and 70 but, rather, faces the costs of health care services starting at age 70 in 2014. The mean at age 70 is \$192,000, and the 95th percentile

is \$317,000.<sup>20</sup> Corresponding amounts for ages 75, 80, 85, and 90 are shown in subsequent bars. Interestingly, the gap between the mean and 95th percentile – while significant – is not enormous.

Figure 2 shows corresponding results when nursing home care is included in health care costs. Growth in nursing home costs is driven more by wage growth than by advances in health care technology. Therefore, this analysis adopts an assumption of 1.1 percent real annual growth, which matches the assumption of the Social Security Administration for long-run wages. At age 65, with nursing home costs included, the mean and 95th percentile of remaining lifetime nursing home costs increase to \$260,000 and \$570,000, respectively. This gap is much larger than that shown in Figure 1, as nursing home costs substantially raise the risk associated with lifetime health care costs for older households. This finding is not surprising given that few households have insurance for nursing home costs, while most of those over 65 are insured for general health care costs under Medicare.

Remaining lifetime health care costs decline with age. But households face substantial health-care-cost risk even at advanced ages, which may explain why many wealthy retired households decumulate their wealth more slowly than would be predicted by a simple life-cycle model of savings behavior.<sup>21</sup>

FIGURE 2. MEAN AND 95TH PERCENTILE OF REMAINING LIFETIME HEALTH CARE COSTS INCLUDING NURSING HOME CARE, AT SELECTED AGES



Note: See note for Figure 1.

Source: Webb and Zhivan (2010).

## Conclusion

Estimates of the average amount a household can expect to spend on health care costs do not provide any information about the risk of incurring exceptionally large expenses. At age 65, a typical married couple free of chronic disease can expect to spend \$197,000 on remaining lifetime health care costs – excluding nursing home care – while it faces a 5-percent probability that these costs will exceed \$311,000. Including nursing home care, the mean cost is \$260,000, with a 5-percent probability of costs exceeding \$570,000. Less than 15 percent of households approaching retirement have accumulated that much in *total* financial assets.

In short, the main risk involved in assessing potential health care costs is nursing home care. Incorporating these costs, households face a significant risk that could threaten their retirement security. When deciding how much to save for retirement, and how rapidly to draw down their wealth during retirement, households need to consider what risk they are prepared to accept of having their assets substantially depleted by health care costs, whether they are above or below the average risk of incurring exceptionally high costs, and whether they should insure against health care costs by purchasing long-term care insurance.

## Endnotes

- 1 See Table 2 of Munnell et al. (2008). This calculation assumes that there are no systematic differences between the expenditures of married and single individuals. Some of these co-payments will be covered by Medigap and retiree health insurance, but individuals will also spend considerable amounts on co-pays for non-Medicare services, such as dental care, eyeglasses, and hearing aids.
- 2 Webb and Zhivan (2010).
- 3 The \$197,000 figure is comparable to the results of other research (Munnell et al., 2008).
- 4 For the purposes of this analysis, home health care costs are included with other general health care costs, nursing home costs are treated separately, and the costs of assisted living facilities are excluded.
- 5 Financial assets include defined contribution plans, IRAs, and other net non-retirement financial assets.
- 6 As used in this *brief*, retiree health insurance does not include long-term care insurance.
- 7 Spillman and Lubitz (2002); and Congressional Budget Office (2004).
- 8 Prudential (2008).
- 9 French and Jones (2004) show that health care costs are highly persistent.
- 10 The *Health and Retirement Study* is a panel of over 7,000 individuals age 51 to 61 in 1992, and their spouses of any age, with younger households being added to the panel in 1998 and 2004. Individuals have been interviewed every two years, the latest interview being in 2008. At each interview, individuals are asked about their health status and expenditure. Michaud et al. (2009) have used the HRS data to simulate health and mortality outcomes and to estimate the impact on public finances of trends in the prevalence of obesity and smoking.

11 A potential concern with the HRS data, raised by Hurd and Rohwedder (2009), is misreporting of health care expenditure by HRS households. Webb and Zhivan (2010) address this concern by recoding the small number of expenditures that are implausibly large in relation to the household's income and assets. On the other hand, the HRS excludes individuals who were institutionalized at baseline. Both this and other analyses based upon HRS data will therefore likely understate nursing home care costs.

12 Some of these variations may reflect different preferences and budget constraints. But they are probably largely the result of variations in the severity of disease and its amenability to treatment.

13 Data are from the Centers for Medicare and Medicaid Services, Office of the Actuary. Expenditure growth is largely the result of the introduction of new and expensive medical technologies (Congressional Budget Office, 2008). The 4.2 percent rate of growth in inflation-adjusted out-of-pocket health care costs is consistent with estimates of Hagist and Kotlikoff (2005).

14 Congressional Budget Office (2008).

15 The simulations are based upon an AR(1) model of the rate of growth of per-capita inflation-adjusted health care expenditure, estimated from the above data.

16 The authors exclude Medicaid-eligible households from the HRS sample upon which the simulated data are based and include an indicator variable for those with less than zero financial assets to avoid underestimating the risk faced by the remainder of the population.

17 Hubbard, Skinner, and Zeldes (1995) argue that it may be optimal for low-income households to accumulate very little financial wealth during their lifetime, and to rely on Medicaid in the event of an adverse health shock.

18 The data upon which the simulations are based almost entirely predate the January 1, 2006 introduction of Medicare Part D. This benefit will reduce the health-care-cost risk faced by those retirees previously lacking comparable coverage. Households differ in their insurance coverage and risk of incurring medical expenses. The 95th percentile represents the average of the 95th percentile of the simulated outcomes for each of the households in the sample.

19 The calculations use a 3 percent real interest rate.

20 The age 70 mean and 95th percentile of remaining lifetime health care costs faced by a particular household will depend on its health status at age 70. Suppose there are only two health states – “good” and “bad” – and there is an equal probability of a household being in each state at age 70. The 95th percentile of remaining lifetime health care costs when the household is in good health might be \$307,000, and the corresponding percentile when the household is in bad health might be \$327,000. Figure 1 shows the 95th percentile of remaining lifetime health care costs averaged across initial health states, i.e., \$317,000.

21 Previous research – for example, DeNardi, French, and Jones (2006) – has shown this relatively slow pattern of decumulation.

## References

- Centers for Medicare and Medicaid Services, Office of the Actuary. 2007. "Projected Medicare Part B Expenditures Under Two Illustrative Scenarios with Alternative Physician Payment Updates." Memorandum from M. Kent Clemens. Washington, DC: U.S. Department of Health and Human Services.
- Congressional Budget Office. 2004. "Financing Long-Term Care for the Elderly." Washington, DC: U.S. Government Printing Office.
- Congressional Budget Office. 2008. "Growth in Health Care Costs." CBO Testimony. Statement of Peter R. Orszag before the Committee on the Budget, U.S. Senate.
- DeNardi, Mariacristina, Eric French, and John Bailey Jones. 2006. "Differential Mortality, Uncertain Medical Expenses, and the Saving of Elderly Singles." Working Paper 12554. Cambridge, MA: National Bureau of Economic Research.
- French, Eric, and John Bailey Jones. 2004. "On the Distribution and Dynamics of Health Care Costs." *Journal of Applied Econometrics* 19: 705-721.
- Hagist, Christian, and Laurence Kotlikoff. 2005. "Who's Going Broke? Comparing Growth in Healthcare Costs in Ten OECD Countries." Working Paper 11833. Cambridge, MA: National Bureau of Economic Research.
- Hubbard, R. Glenn, Jonathan Skinner, and Stephen P. Zeldes. 1995. "Precautionary Saving and Social Insurance." *Journal of Political Economy* 103(2): 360-399.
- Hurd, Michael D. and Susann Rohwedder. 2009. "The Level and Risk of Out-of-Pocket Health Care Spending." Working Paper 218. Ann Arbor, MI: Michigan Retirement Research Center.
- Michaud, Pierre-Carl, Daba Goldman, Darius Lakdawalla, Yuhui Zheng, and Adam Gailey. 2009. "Understanding the Economic Consequences of Shifting Trends in Population Health." Working Paper 15231. Cambridge, MA: National Bureau of Economic Research.
- Munnell, Alicia H., Mauricio Soto, Anthony Webb, Francesca Golub-Sass, and Dan Muldoon. 2008. "Health Care Costs Drive Up the National Retirement Risk Index." *Issue in Brief* 8-3. Chestnut Hill, MA: Center for Retirement Research at Boston College.
- Prudential. 2008. "Long-Term Care Cost Study." Research Report. Available at: <http://web.prudential.com/media/managed/LTCCostStudy.pdf>.
- Spillman, Brenda C. and James Lubitz. 2002. "New Estimates of Lifetime Nursing Home Use: Have Patterns of Use Changed?" *Medical Care* 40(10): 965-975.
- University of Michigan. *Health and Retirement Study*, 1996-2006. Ann Arbor, MI: Institute for Social Research.
- Webb, Anthony and Natalia Zhivan. 2010. "How Much is Enough? The Distribution of Lifetime Health-Care Costs." Working Paper 10-1. Chestnut Hill, MA: Center for Retirement Research at Boston College.

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