HOW DO RETIREES COPE WITH UNINSURED MEDICAL AND LONG-TERM CARE COSTS?

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Introduction

Even the best-laid plans can go awry. Individuals face many hurdles to adequate planning for retirement and, even when precautions are taken, they may be overwhelmed by a big enough shock. In particular, large medical and long-term care (LTC) spending shocks can devastate retirees' hard-won finances. What, then, do individuals and households do when first-line plans to deal with healthcare costs fail? This paper studies the consequences of large out-of-pocket (OOP) medical and LTC shocks on retired households to explore this question, focusing on the Medicare-eligible population of over 65-year-olds. A large shock represents a failure of insurance to insulate the household from the healthcare expenditure, either because of lack of coverage (typical for LTC) or because of cost-sharing in existing insurance (typical in health insurance).

The analysis has two parts. First, it presents results from a recent survey dealing with healthcare shocks in retirement. This paper focuses on a small selection of questions from the survey, demonstrating what individuals believe their fallback options are after a healthcare shock.[1] The analysis then turns to the *Health and Retirement Study* (HRS), a large longitudinal survey, to estimate how households actually fare following a large healthcare expenditure. We examine the years 2002-2016.[2] Throughout, we use "healthcare" to refer to any health-related costs, whether they involve periodic medical care or long-term care.

A medical shock is defined as an expenditure in the top ten percent of medical OOP expenses in a given year. These costs are comprised of payments to doctors, hospitals, dentists, and for outpatient surgery and prescription drugs. Because OOP LTC spending is relatively rare, an LTC shock is defined as having any positive spending on nursing home or home care. To analyze the effects of such shocks, the analysis must contend with the fact that households bearing such large OOP costs are not similar to households spared these shocks. In response, we follow the methodology described in Fadlon and Nielsen (2021), comparing households that experience a shock in a given year to households that *will* experience the same shock four years in the future. The assumption here is that the exact timing of the shock is random, even if the type of households that experience such shocks is not. The approach yields a difference-in-differences estimate of the causal effects of such shocks.

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[1] For a more comprehensive treatment of the results of the survey, see Chen, Munnell, and Wettstein (2025a).
[2] These year restrictions allow for sufficient time before and after health shocks to assess their impacts.

Briefly, we find that LTC shocks lead to drawdown of home equity; reduction in bequest expectations; and, above all, increased reliance on Medicaid. In contrast, large medical shocks seem to be borne by individuals without severely impacting their retirement trajectories; the effect of such shocks is limited to reductions in expected bequests. These patterns match individual perceptions of relying on Medicaid in case of large shocks; however, individuals seem not to anticipate the need for drawing down home equity. Overall, results point to medical shocks being relatively well-insured while individuals are still exposed to meaningful LTC risk. The results are also consistent with prior work showing that bequests may serve a double role as desirable transfers to the next generation if possible, but also as a cushion to self-insure LTC shocks if necessary (Poterba, Venti, and Wise 2011 and Lockwood 2018).

The rest of the paper proceeds as follows. The first section reviews the existing literature on how households protect themselves from medical and LTC expense shocks, and what befalls them when they nevertheless suffer shocks. The second section describes the data from the new survey and the HRS used in the two parts of the analysis. The third section walks through the methodology for analyzing the HRS data. The fourth section presents the prospective results from the survey, while the fifth section describes the results of the retrospective causal analysis from the HRS. The final section concludes that medical shocks are well-insured in retirement, while LTC shocks are absorbed primarily through Medicaid.

How Well Are Retirees Insured against Healthcare Risks?

Few topics in household and public finance have received as much attention as medical insurance in the United States. Only somewhat less studied are questions pertaining to LTC insurance, and that is only because such insurance is rare and patchy. A comprehensive review of the institutional setting of medical and LTC insurance in the United States, and the literature on such shocks, is available in Chen, Munnell, and Wettstein (2025b). This section will narrowly focus on two questions: first, how are typical U.S. retirees insured against medical and LTC shocks and what are the gaps in coverage? And, second, what has the economics literature found to date on the consequences of large healthcare shocks?

What Health Insurance Gaps Are Faced by Retirees?

Starting off with medical costs, Medicare covers nearly all U.S. adults over age 65 – only about 1 percent of this population is uninsured.[3] Furthermore, about half were covered by a Medicare Advantage plan in 2021 (see Figure 1). The remainder typically had a combination of Traditional Medicare and supplemental coverage either from an employer (current or previous), a Medigap plan, or Medicaid. Only 5 percent of those over 65 were covered solely by Traditional Medicare.

Thus, retirees are only exposed to medical costs to the extent that Medicare plus any supplemental coverage they carry involve consumer cost sharing. While such cost sharing can be substantial in Traditional Medicare, the supplemental arrangements that the vast majority of retirees have can reduce the burden.

Where could high medical OOP costs arise, given this institutional framework? One area is prescription drugs. Medicare drug coverage initially included substantial gaps, and supplemental coverage in those years also often did not cover drugs. Moreover, when the drug benefit was added to Medicare in 2006, it left a "donut hole" of thousands of dollars a year of drug costs that were uncovered, until a consumer hit "catastrophic" levels of spending (after which they still faced a 5-percent coinsurance rate, which could itself be extremely high given the cost of some specialty drugs). Since then, the donut hole and cost sharing for catastrophic coverage have been eliminated, but the sample period in this analysis includes years where drugs were either not covered at all by Traditional Medicare, or were covered very partially.

Another possible source of high OOP medical costs is services not covered by Traditional Medicare at all, such as (non-emergency) dental care. While some supplemental coverage includes dental services, such insurance is far from universal or complete, even when offered.

Finally, even with supplemental insurance to augment Medicare, cost-sharing for doctor and hospital services typically involves some copay or coinsurance. While annual OOP costs are capped by supplemental coverage such as Medicare Advantage (though not in Traditional Medicare), those caps may still leave households exposed to thousands of dollars of annual costs. In 2024, Medicare Advantage plans must cap OOP annual costs to enrollees at $8,850 for in-network services and $13,300 for out-of-network services; and, since many households are

[3] See Tolbert, Drake, and Damico (2023) and Lindstrom, Keisler-Starkey, and Bunch (2024).

married couples, the household cap is effectively doubled for them.[4] Furthermore, the networks for such plans generally will not provide non-emergency coverage for individuals traveling far from their home, either domestically or abroad – another potential source of high costs in spite of coverage.

All the above pertains to medical shocks. But, when it comes to LTC, the potential risks households are exposed to are even more dire. About 80 percent of retirees will require some LTC, with a quarter requiring high-intensity care for more than two years (Chen, Munnell, and Wettstein 2025b). Very little of this care is covered by insurance – only about 4 percent (see Figure 2).[5] The rest is covered primarily by informal care from family members, and the lion's share of paid care is eventually covered by Medicaid. However, Medicaid eligibility requires the household to be impoverished. Thus, Medicaid is a safety net, but not an effective form of insurance, since its deductible is virtually the entirety of a household's assets.[6] The lack of insurance for formal care is troubling, given that the cost of care is extremely high: the average cost of a semi-private room in a nursing home in the United States is over $100,000 per year, as of 2023 (Genworth 2023).

In sum, U.S. retirees are exposed to moderate medical spending risk, however it is mostly capped at around $20,000 per year (for a married household with Medicare Advantage) (Chen, Munnell, and Wettstein 2025b). While no mean sum, it is unlikely to completely derail a household's long-term finances, although it may require adjustments (particularly as many health conditions persist for numerous years). In contrast, LTC can easily overwhelm household finances with just a few years of intensive need of care.

What Is Known about How Retirees Cope with Medical or LTC Shocks?

The economics literature on how retiree households fare financially in the wake of a medical or LTC spending shock is surprisingly limited. Some work in European contexts has explored how working households respond to severe medical shocks to one of the household members, but primarily focusing on working-age households and their labor responses (Fadlon

[4] See Freed et al. (2023).
[5] Currently, only about 7.5 million people have LTC insurance in the United States, representing around 3 percent of adults or 15 percent of those ages 65 and older (Gruber and McGarry 2023 and American Association of Long-term Care Insurance 2020).
[6] Some allowance is made if a household retains a community-dwelling spouse, such as an exemption of the house from asset tests.

and Nielsen 2021). Recent work in the United States explores, again, the labor-market impacts of medical shocks (Gorry and Leganza 2024); however, this work does not ask about the financial consequences of the shocks, and the shocks themselves are medical in nature – and likely well-insured – rather than OOP spending shocks resulting from gaps in insurance. In general, this literature does find significant responses to healthcare shocks, of reductions in labor on the part of the sick individual and increases on the part of other household members.

Thus, to date there has been little research into older households, who are unlikely to respond to shocks by increasing labor supply. In an attempt to fill that gap, the following reports the results of a recent household survey on people's perceptions of possible shocks and their fallback plans if resources are inadequate. These results are then supplemented with findings from the HRS describing what actually happens to retirees in the wake of a healthcare shock using a research design similar to that in Fadlon and Nielsen (2021). In the next section we describe the data underlying these two approaches.

Survey and HRS Data

In this section we first describe the survey data on how households expect to cope with big health-related financial shocks if they should occur. We then describe the HRS sample used to estimate how households react, in fact, to such large shocks.

The Survey

The survey was conducted by Greenwald Research July 12-23, 2024, and contacted 508 respondents online. The respondents all had at least $100,000 of financial assets, were ages 48-78, and were involved in the financial decision-making of their households.

The Health and Retirement Study

The second main dataset used in this analysis is the HRS. This dataset complements the Greenwald survey by providing information on what households actually experience following a financial health shock, rather than how they plan to handle such a shock in advance. The HRS is a biennial survey representative of the U.S. population over age 50 and their spouses. Although all respondents are initially sampled from the non-institutionalized population when first

interviewed, individuals are tracked and re-interviewed even as they enter nursing homes and other institutions.

Furthermore, the HRS includes questions on OOP health expenses by provider: doctors, hospitals, prescription drugs, outpatient surgery, and dental costs on the medical front; and nursing home care, and home care on the LTC front.[7] These OOP expenses are used to define "health shocks" and "LTC shocks". An individual is considered to have experienced a health shock in a given year if their spending was in the top ten percent of medical OOP expenses in that year. For LTC, because only a small share of the sample have any significant LTC OOP spending, we define the shock as having any such spending. Individuals who experience multiple such years of high spending are considered to have experienced the shock the first time that they have such high spending, where subsequent high-OOP years are no longer viewed as shocks but as sequelae of the initial event. This process yields nearly 2,000 unique individuals in the LTC shock group and around 5,500 in the medical shock group. All dollar amounts are inflated to 2023 dollars.

The outcomes we consider are a variety of possible consequences of a large health expense. First, we include the most important safety-net program, Medicaid enrollment. We then consider how the shock affects the individual's household assets – overall, residential, and non-residential – with an eye toward assessing if the shock leads to downsizing to fund the expense. We then turn to other ways individuals might absorb such shocks that have implications for the next generation: bequest expectations and whether the individual lives with their children (for example, to more easily receive care). The bequest expectations questions are phrased in terms of the probability the respondent believes they will leave a bequest of $X or more, where X is $10,000, $100,000, and $500,000.

The HRS conducts interviews every other year. In this study, we focus on the years 2002-2016. 2002 was the first year the HRS split out medical and LTC expenses, which we use to define a "shock." Looking at shocks through 2016 ensures that we observe sufficient years following a shock to consider effects lasting two years after the event. The research design requires the observation of outcomes for four years further out to provide a comparison group

[7] The HRS also asks about OOP costs for "special facilities:" adult care centers, social workers, outpatient rehab, and transportation/meals for the elderly and disabled. These are not included in our definition of an LTC shock, as the amounts involved are very small: the 99th percentile of spending on all these facilities combined is about $1,500.

(see next section for details), taking the analysis through the most recent wave of the HRS in 2022.

Methods

Individuals struck by health and LTC shocks are not comparable to individuals who do not experience such adverse events. They may have had poorer health throughout their lives, or they may lack sufficient insurance coverage because of either preexisting conditions or a lack of resources, or simply personal risk preferences. Such differences are difficult to control for statistically in a regression.

Instead, this analysis takes an approach developed in other recent work on health shocks (Fadlon and Nielsen 2021). The design focuses solely on individuals who experience the relevant shock but uses those who will experience the shock at some time in the future as a comparison group for those experiencing the shock at a given time. The intuition behind this identification strategy is that while the fact of being exposed to a shock is not random, the precise timing of such a shock is effectively random. Thus, an individual hit with a large healthcare expenditure in a specific year should be similar on all manner of unobservable characteristics to one hit by the same shock just a few years later, particularly if age and time are explicitly included as controls in the regression.

In this setting, we define the "treatment" group as individuals suffering a medical or LTC shock, respectively, and match them with a "control" group of individuals experiencing the same type of shock two waves (or four years) later. In this manner, the effects of the shock on the outcome variables can be estimated at the time of impact, and up to two years later. Beyond that timeframe, the control group is itself treated, and can no longer offer a plausible counterfactual for the outcome variables.

Once treatment and control groups are defined in this way, a difference-in-differences design is employed to estimate the causal effect of the shock. The following equation describes the regression:

$$Y_{i,t} = \alpha + \sum\nolimits_{\tau} (\beta_{\tau} * S_{i,t} * I(Year_t = \tau) + \sum\nolimits_{\tau} (\gamma_{\tau} * I(Year_t = \tau) + \delta_{i,t} + \theta_i + \varepsilon_{i,t}$$

$Y_{i,t}$ represents the value of each of the outcome variables for individual i at time t. $S_{i,t}$ is an indicator for the individual being treated at time *t*. $Year_t$ is an indicator for each year in the

analysis, normalized to 0 in the year before the shock. $\delta_{i,t}$ is a vector of indicators for age, which is important in this setting since the control group is likely younger than the treatment group. θ_i is an individual fixed effect, which controls for all the characteristics of the individual that do not change over time in this setting, such as gender, race, and education, as well as baseline pre-shock characteristics such as pre-shock health status. The standard errors are clustered at the individual level.

With this regression, the β_τ coefficients can be interpreted in two ways, depending on whether τ is positive or negative. For negative values, before the shock, the estimates will test whether the treatment and control groups are on parallel trends before the treatment group experiences their shock. Insignificant coefficients here imply that the two groups' outcomes develop similarly until the treatment group is hit by their high health spending event. When $\tau = 0$, the wave prior to the shock, this coefficient is normalized to 0. For positive values of τ, the coefficient yields the estimate of the causal effect of the shock in the year of the event ($\tau = 1$) and two years thereafter ($\tau = 2$).

Results

This section starts with a description of what households anticipate will be their means of coping with a large medical or LTC shock from the Greenwald survey. The remainder of the section describes the results of the difference-in-differences analysis in the HRS to explore how households actually respond to such shocks.

Survey Results

The survey asked participants about their perceived likelihood of experiencing a medical shock or needing extensive LTC, as well as the potential cost of these events. A key finding, consistent with other studies, was that medical and LTC risks were generally low on their list of concerns (see Figure 3).[8] Moreover, responses to detailed questions in the recent survey about the likelihood of needing care and the cost of that care reinforce the notion that older adults underestimate the risks and costs.

[8] See Hou (2020).

Underestimating the risks of large outlays for healthcare means that households will likely not have adequate insurance or financial resources to cover such needs if they arise. When asked what alternatives they would consider if they could not afford their healthcare expenses, over 60 percent said they would consider spending down to Medicaid, while only around 30 percent said they would consider using their home equity or moving in with their children (see Figure 4). The question is to what extent are these alternatives actually used by real households? To answer that question, the analysis turns to the HRS.[9]

HRS Analysis of Realized Shocks

This section describes the results of the analysis studying individual and household responses to large financial health shocks. The impacts of LTC shocks are explored first, followed by the impacts of medical shocks. However, before turning to the results of the analysis, some details on the analysis samples help provide context.

Descriptive Characteristics of the Analysis Samples. This section describes two separate analyses, with two distinct analysis samples. The first is individuals who ever experience an LTC event, while the second is those who undergo a large financial medical shock. Tables 1 and 2 show the descriptive statistics for these two samples, respectively. These samples are both roughly similar to the older U.S. population in demographic characteristics, and are broadly similar to each other except that those suffering an LTC shock tend to be about five years older than those experiencing a medical shock – on average 80 years old for the former. Large medical shocks also tend to be experienced by households with greater education and wealth and, correspondingly, greater expectations of leaving large bequests.[10]

More information on the type and magnitude of the shocks each sample experiences is also informative in understanding the context of the analysis. Tables 3 and 4 provide this background.

Table 3 considers three samples: the LTC sample, the medical sample, and the full HRS over age 65. For each such population, the table displays total mean OOP costs (in the year of

[9] The public-use HRS does not include good data on moving to cheaper states or abroad, so these outcomes in Figure 4 will not be analyzed.

[10] Part of the difference in wealth and education may itself stem from the fact that households suffering an LTC shock are older and were born in earlier cohorts. Thus, they have likely drawn down more of their wealth and came of age in periods when lower educational attainment was the norm.

the shock for the treatment populations, in all years for the general population); mean LTC and medical OOP costs; and a breakdown of such costs by type of service. The table further provides select quantiles and the standard deviation of each measure. While each treatment sample is already the upper tail of spending in medical and LTC, respectively, health spending is extremely skewed such that even within this tail substantial variation remains. In interpreting the results, this context is important since some individuals in the treated group will face costs dramatically higher than even the shocks experienced by the typical treated individual.

Overall, the annual OOP costs of the treatment samples are quite high, and similar for both samples – about $10,000 of OOP costs across all health services. The standard deviation of these costs is also large – an individual who is a single standard deviation above the mean would face nearly $30,000 of OOP expenses in the shock year. Health costs also tend to be persistent, so the initial shock may well be an indication of further expenses to come.[11]

Otherwise, most of the patterns in Table 3 are intuitive: the LTC shock sample has much higher LTC OOP costs than the general population and the medical shock population, and the same is true for the medical shock group with regard to medical expenses. Roughly two-thirds of LTC OOP expenses are nursing homes, while the balance is almost entirely home care; special services are a small OOP cost.

For the Medical Shock group, about half of medical costs are prescription drug expenditures, with the rest roughly evenly divided between doctor, hospital, and dental services (and a smaller outlay for outpatient surgery). This distribution is not surprising given that the sample period spans 2002-2016, so some of these shock years occurred before the introduction of Medicare Part D, and all before the elimination of the donut hole in the standard Part D benefit.

Interestingly, while the medical group has much higher medical than LTC spending, the converse does not hold for the LTC population. That group actually faces higher medical than LTC costs. This pattern underscores that LTC needs do not generally arise in a vacuum, and individuals facing large expenses for LTC typically also need to bear large medical expenses at the same time.

[11] Hubbard, Skinner, and Zeldes (1995) find that health spending has an autoregressive coefficient of 0.9; while more recently De Nardi, French, and Jones (2010) find a similar persistence of 0.922.

Table 4 looks at what health conditions are associated with each type of shock: LTC and medical. As with Table 3, the three populations described in Table 4 are the LTC shock group, the medical shock group, and the full HRS over-65 population. The Table shows the share of each group first diagnosed with one of the listed health conditions since their last interview (typically, in the prior two years). Thus, for the two treatment groups, the means of each condition yield the chance of first being diagnosed with that condition just prior to the OOP expenditure triggering inclusion in that group. The general population here provides a baseline chance of diagnosis with each condition.

Table 4 shows that different diagnoses are associated with LTC and medical shocks. Compared to the general older U.S. population, those requiring LTC for the first time are more likely to have recently been diagnosed with cancer, lung disease, and psychiatric problems, as well as, in particular, heart disease and stroke.[12] Nearly 10 percent of those first requiring LTC were also first diagnosed with heart issues or with a stroke in the two years prior to their LTC need.[13] In contrast, the medical shock group was particularly likely to be diagnosed with cancer, heart disease, and stroke, but stroke is far less disproportionately common in this group.

The Impact of LTC Shocks on Older U.S. Adults. With this context in mind, Figures 5 through 14 show the impacts of an LTC shock on a variety of outcomes capturing how individuals might absorb such expenses.[14] First and most striking, Figure 5 shows that the share of individuals covered by Medicaid increases dramatically, by 6.6 percentage points, in the year of the LTC shock, and increases yet again the following year to 9 percentage points above the comparison group. These increases are enormous in relation to the baseline rate of Medicaid coverage in this population before the shock of 0.06 (see Table 1), implying a 150 percent increase in Medicaid enrollment two years following an initial LTC shock. Furthermore, in the years prior to the shock the treatment and control groups move in parallel, as evidenced by the lack of significant differences in years -4 to -1. Thus, the figure suggests this increased Medicaid enrollment really is a causal effect of the LTC shock.

[12] The HRS did not include explicit questions about Alzheimer's disease or dementia for most of the analysis years, and so this outcome was not broken out explicitly.
[13] Some share of this group would have been diagnosed with *both* heart disease and stroke shortly prior to their LTC event.
[14] Full regression results for all these figures are in Appendix Table A1.

Increased reliance on Medicaid comports with what respondents to our survey indicated they would do if healthcare costs proved too large (see Figure 4). However, Medicaid is not a good solution for all households – in particular, it requires the household to forfeit virtually all their assets. The survey results indicated respondents were not often prepared to tap their home equity in pursuit of LTC.

On this front, the results in Figures 6, 7 and 8 are not reassuring. The net worth of households hit by an LTC shock declines in the year of the shock by $68,000, on average, relative to the comparison group, even as no significant pre-trend differences between the groups exist. While the gap shrinks to some extent the following year, its point estimate remains very negative. Moreover, while the point estimates on non-residential wealth are very negative in both the wave of and the wave following the shock, they are not statistically significant (see Figure 7). Rather, the estimated decline in the value of the primary residence in Figure 8 suggests households do draw down their home equity meaningfully to finance LTC shocks, despite their stated intentions in the survey to mostly preserve such wealth. This pattern is consistent with analysis by Poterba, Venti, and Wise (2011) showing households rarely tap home equity – except when moving into a nursing home or near death.

Another way individuals can finance LTC is by reducing the amount they set aside for bequests. Lockwood (2018) hypothesizes that bequests are a luxury good and, as such, holding assets in reserve to be passed on as incidental bequests if individuals do not need much LTC is complementary to using such reserves to finance LTC in the event that such expenses are required. We find evidence consistent with this model: the individuals in the analysis reduce their expected probability of leaving bequests of $10,000 or more, or of $100,000 or more, as a result of an LTC shock (see Figures 9 and 10). Both declines are modest in magnitude, at 4 percentage points each, but such probability questions are notoriously insensitive as respondents tend to round their answers substantially (Hendren 2016). However, we find no statistically significant impact on expected bequests of $500,000 or more (see Figure 11), although the small expected mean probability of leaving such bequests to begin with suggests there is not much room for these expectations to fall (see Table 1).

Finally, some comfort can be taken in the fact that we find no evidence of individuals suffering an LTC shock moving in with their children (see Figure 12) or of moving closer to their children (or their children moving closer to them; see Figure 13). This pattern is consistent

with the distinct preference of respondents in the survey to only move in with their kids as a last resort.

One other effect associated with LTC shocks is a loss of private *health* insurance. Figure 14 shows that in the two years *preceding* the shock individuals experience a significant decline in private coverage which persists into the year of the shock and displays evidence of recovering to some extent two years following the shock. Notably, LTC shocks are often preceded by a significant health shock, and private health insurers in Medigap and Medicare Advantage are cognizant of the future costs associated with such events, leading to some "cream skimming" – selection of the healthiest beneficiaries into these plans (e.g., Cutler and Zeckhauser 2000; Newhouse and McGuire 2014; and Boccuti et al. 2018). While regulation in recent years may have reduced the scope for such selection, it has not been entirely eliminated (Newhouse et al. 2015). The decline in private coverage around an LTC shock is consistent with such cream skimming.[15]

In sum, older individuals seem to have three main methods of absorbing LTC shocks in practice: drawing down wealth (particularly of the primary residence); possibly as a consequence, reducing their intended bequests, at least for modest bequest sizes; and falling back on the quintessential safety net, Medicaid. All of these results are, furthermore, qualitatively similar when the sample is restricted to households with more than $100,000 in financial assets (mirroring the population of our survey).[16]

The Impact of Medical Shocks on Older U.S. Adults. In contrast to the impacts of LTC shocks, the impacts of medical shocks on households over age 65 are actually very limited (see Figures 15-24). No statistically significant impact is found on any of the outcomes, with the exception of the expected chance of leaving a bequest of $100,000 (see Figure 20), which is marginally significant at the 10-percent level. When restricting to households with over $100,000 of financial assets, the impact on expected bequests is marginally significant for both the $10,000 and $100,000 targets. The point estimates are similar for all three target bequests, regardless of financial net worth restriction.

[15] We find no evidence of change in LTC insurance status either in anticipation of the LTC shock or in its wake (at which point coverage is likely to be denied). These (null) results are in Appendix Table A1.
[16] These results are available upon request.

Overall, the results provide suggestive evidence that households are fairly well-insured against medical shocks, and respond, if at all, through a modest reduction in expected bequests. This finding is in sharp contrast to LTC shocks, which is puzzling given that the magnitude of the financial hit in the year of the shock is similar for both types of shock (see Table 3). A possible explanation is the persistence of shocks – while a medical shock is likely predictive of future expenses as well, to some degree, an LTC shock is much more likely to indicate a permanently elevated level of future expenditures.

Indeed, Table 5 shows this. The table parallels Table 3 in showing OOP costs by type of service for each of the treatment samples. However, instead of showing the costs in the year of the shock, it shows the average OOP costs in all the following years that the treated individual is in the sample. Those who experience an LTC shock have an average OOP expense on healthcare (LTC and medical combined) of around $3,200/year for as long as they are observed in the HRS. In contrast, those who suffer a medical shock have expected future expenses of around $2,700/year, only $300/year more than the general over-65 population, at around $2,400/year (in Table 3).

Thus, one explanation for the greater impacts of LTC shocks could be that those shocks also presage larger outlays for the remainder of the individual's life. This difference in expected future costs is compounded by the fact that health insurance is never exhausted, while LTC typically has lifetime limits. Medicare OOP maximums reset every year – except in the lifetime limits on extended hospital stays which, incidentally, provide a close substitute for some medically necessary LTC. In contrast, LTC insurance, to the extent it exists, is typically limited to a small number of years of coverage. Having suffered an LTC OOP expenditure in one year means the individual is likely uninsured with respect to future costs through either Medicare or any private insurance, either because they never had coverage or because it has been exhausted. Therefore, the risk of future LTC costs is understated by the average of such future costs. That LTC shocks entail greater adjustments from affected individuals is, therefore, perhaps not surprising.

Conclusion

Insurance rarely offers full protection from risk, and in the case of health risks, these shortcomings can be substantial. Large OOP healthcare expenditures are an indication of a lack

of adequate insurance, either entirely (typical in the case of LTC) or on the margin (typical of cost sharing in medical insurance). This paper explores how individuals expect to cope with a large healthcare expense that overwhelms their coverage, and how they actually cope in practice.

The analysis shows individuals plan to rely on Medicaid, the main U.S. safety net program for healthcare, if their insurance proves inadequate. The results also confirm that Medicaid is, in fact, the major recourse of individuals struck by LTC shocks, for which private insurance coverage is rare. However, individuals are unlikely to expect to draw down home equity to deal with healthcare expenses, yet we find evidence that this is a typical result of LTC shocks. Finally, such shocks lead to reductions in expected bequests. A factor complicating the ability of individuals to deal with LTC shocks appears to be a loss of supplementary health insurance in the years surrounding the shock – a possible contributor to the high *medical costs* faced by those experiencing an LTC shock.

In contrast to LTC, medical expenses seem well-insured, particularly in the sense that one bad year does not predict extraordinarily high-cost future years. Furthermore, medical insurance does not typically feature lifetime limits, in contrast to LTC insurance (and Medicare coverage for close LTC substitutes such as extended hospital stays). Accordingly, we find little evidence of adjustment in the insurance and financial standing of individuals hit by medical spending shocks, except suggestive evidence of a decline in expected bequests.

Overall, the results speak to the relative lack of protection that retirees have against LTC shocks, and underscore the importance of Medicaid as a payer of last resort for those who develop LTC needs in older age.

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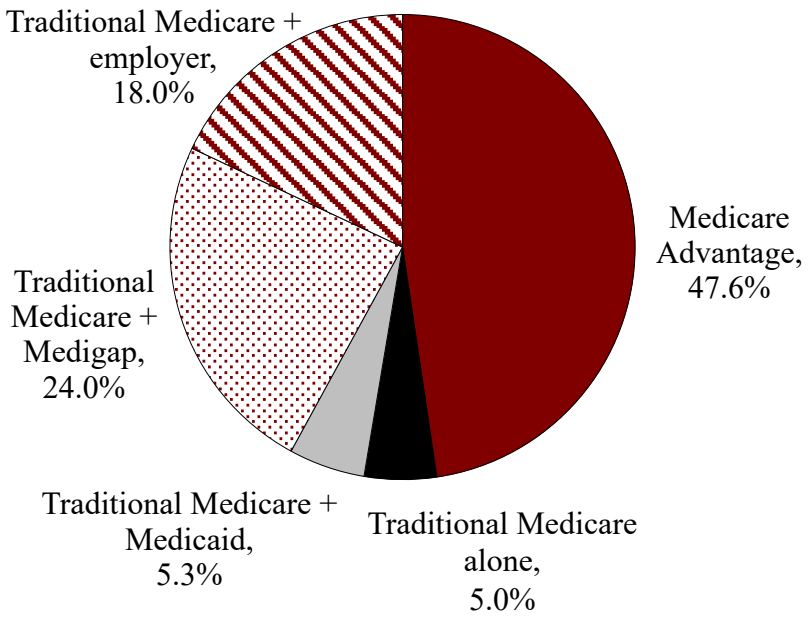
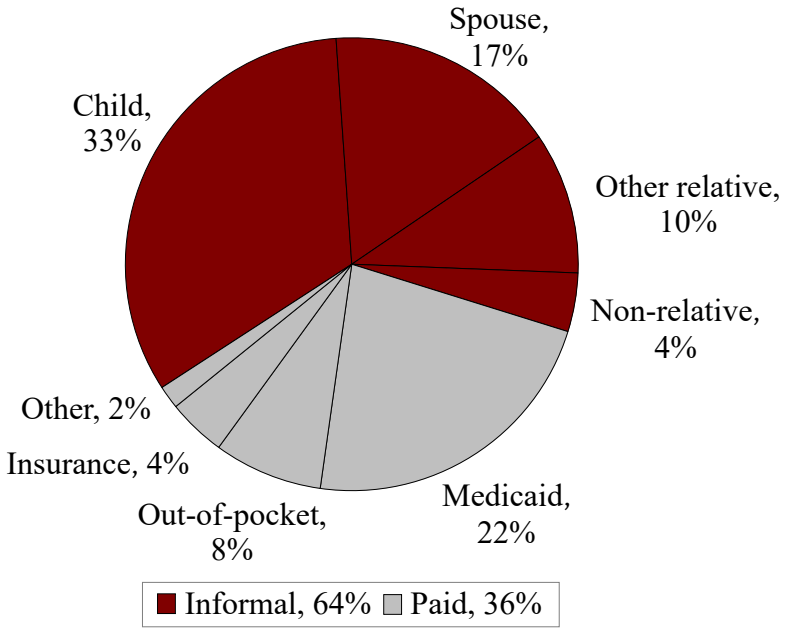
Tables and Figures

Figure 1. *Sources of Health Insurance for Individuals Ages 65+, 2021*



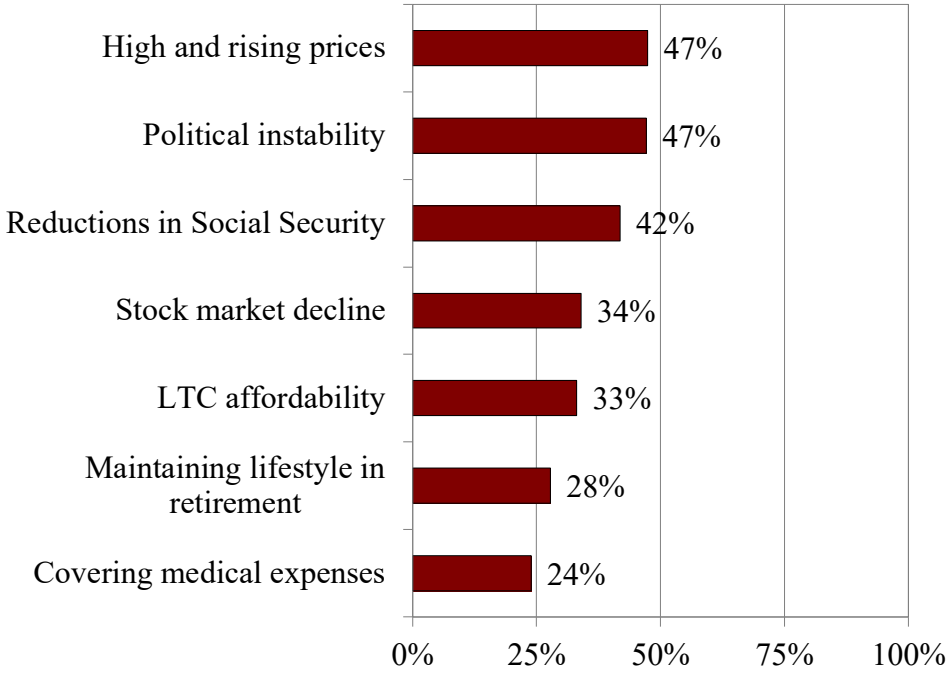
Source: Authors' calculations from Ochieng et al. (2023).

Figure 2. *Percentage of Total Caregiving Hours Provided to Individuals Ages 65+, by Source*



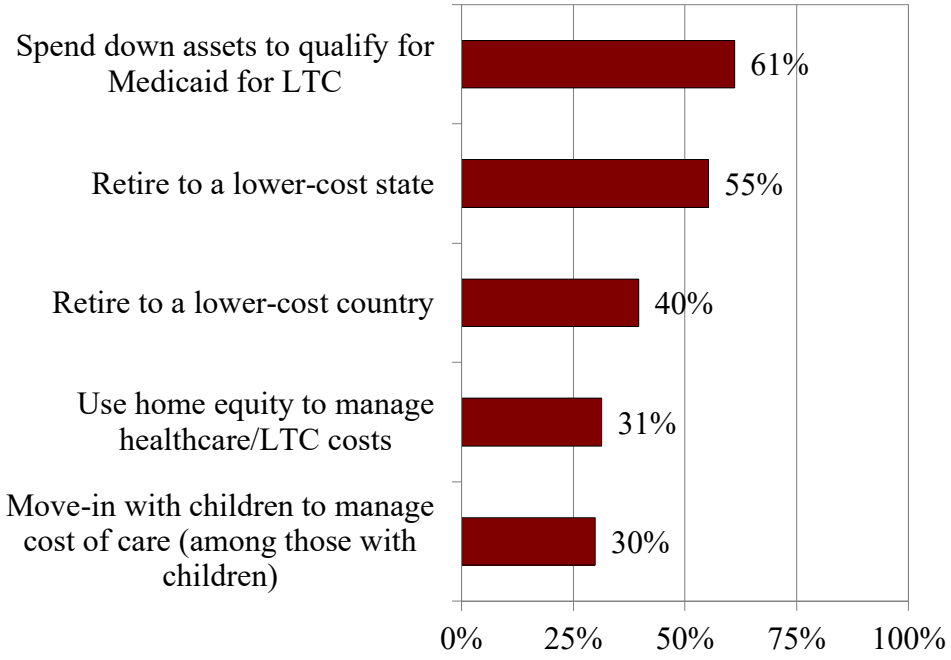
Source: Belbase, Chen, and Munnell (2021b).

Figure 3. *Percentage of Respondents Who Are Worried or Very Worried About Various Retirement Risks*



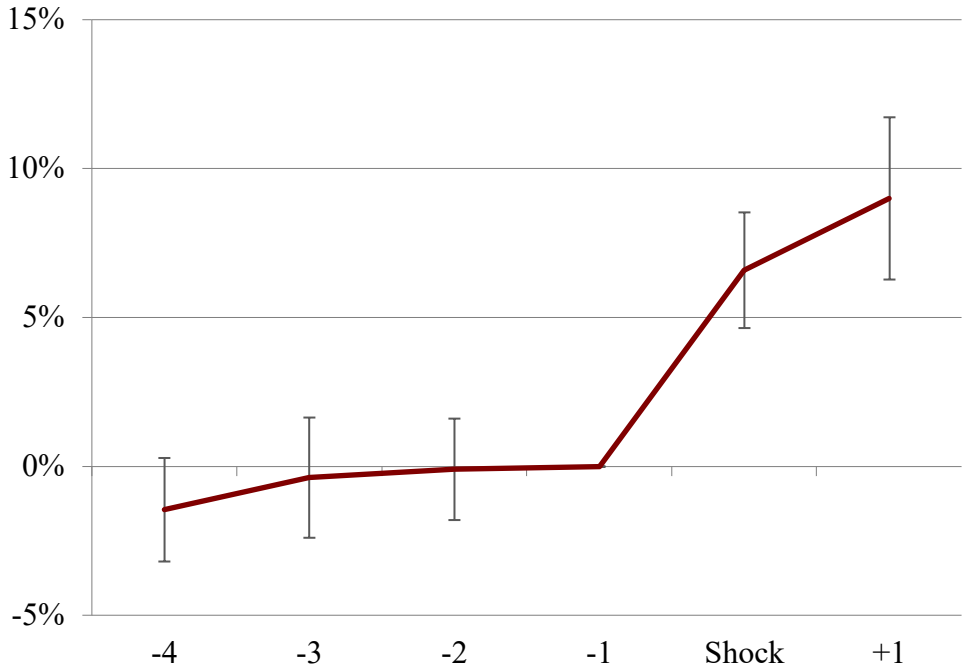
Source: Authors' calculations from the 2024 Greenwald Research Household Survey.

Figure 4. *Percentage of Respondents Making or Considering Various Changes if Healthcare Costs Are Too Large*



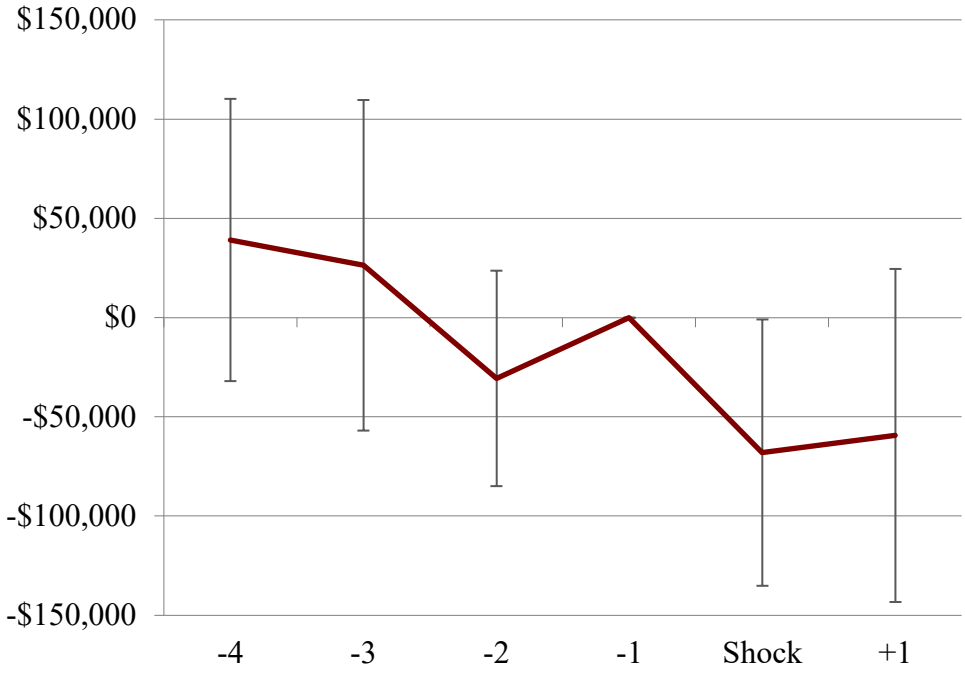
Note: Data show the percentage of those who have already made, have considered making, or may consider making various changes.
Source: Authors' calculations from the 2024 Greenwald Research Household Survey.

Figure 5. *Share of Respondents Who Experience an LTC Shock on Medicaid*



Notes: See Appendix Table A1. Error bars denote the 95 percent confidence interval.
Source: University of Michigan, *Health and Retirement Study* (HRS) (2002-2016).

Figure 6. *Total Wealth of Respondents Who Experience an LTC Shock*

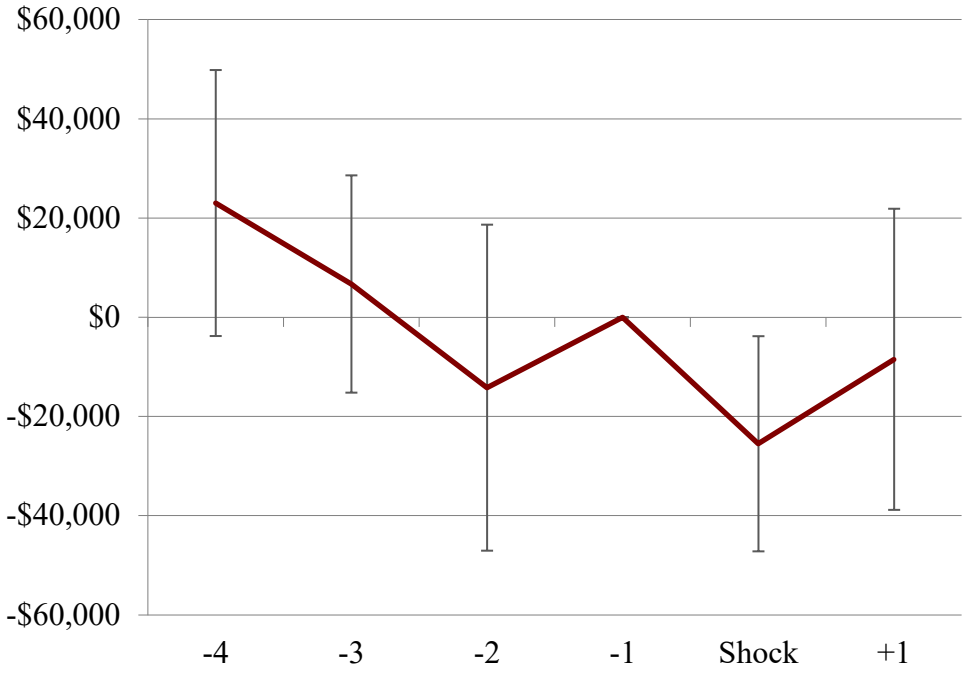


Notes: See Appendix Table A1. Error bars denote the 95 percent confidence interval.
Source: HRS (2002-2016).

Figure 7. *Non-Housing Wealth of Respondents Who Experience an LTC Shock*

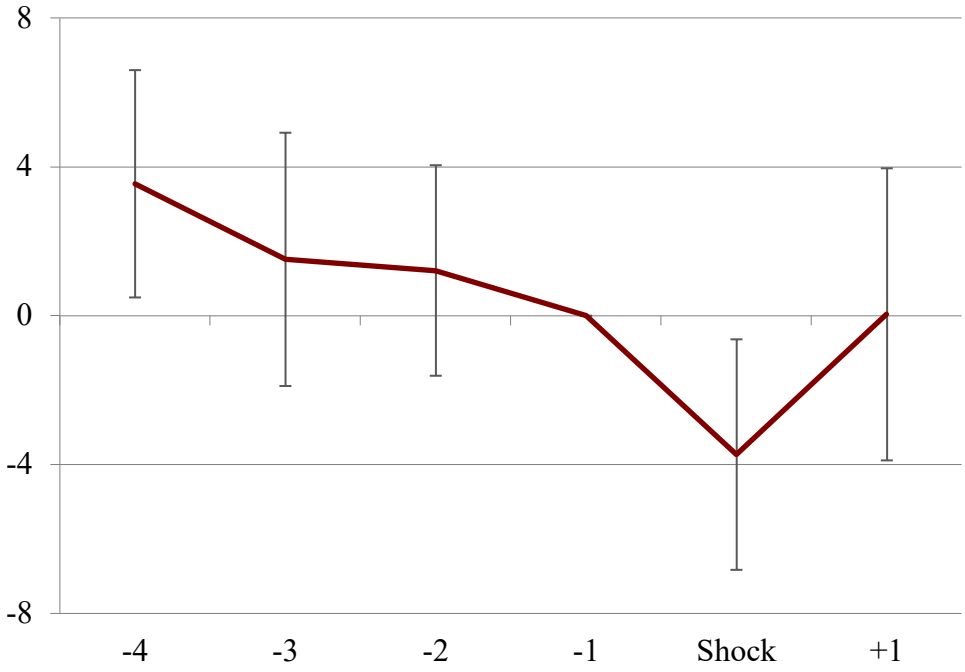
Notes: See Appendix Table A1. Error bars denote the 95 percent confidence interval.
Source: HRS (2002-2016).

Figure 8. *Primary Residence Value of Respondents Who Experience an LTC Shock*



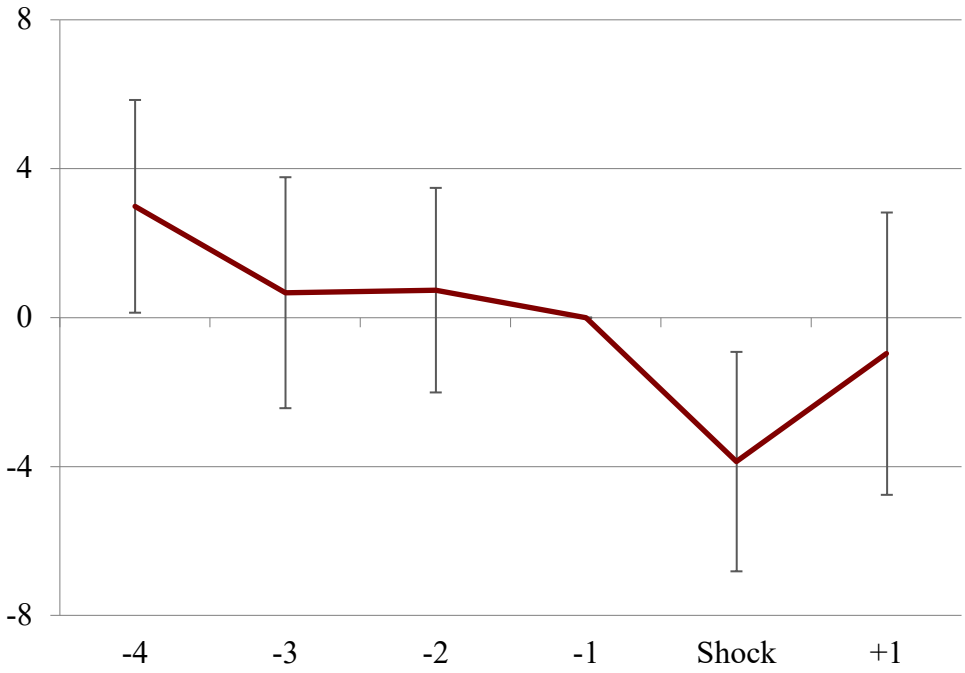
Notes: See Appendix Table A1. Error bars denote the 95 percent confidence interval.
Source: HRS (2002-2016).

Figure 9. *Self-Reported Probability of Leaving More Than $10,000 of Bequests of Respondents Who Experience an LTC Shock*



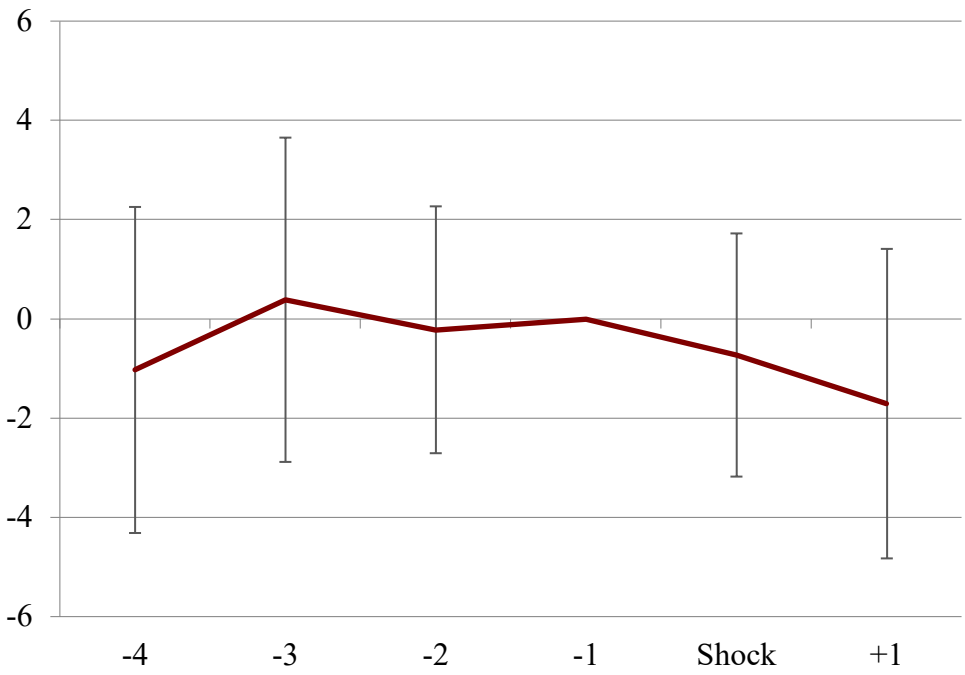
Notes: See Appendix Table A1. Error bars denote the 95 percent confidence interval.
Source: HRS (2002-2016).

Figure 10. *Self-Reported Probability of Leaving More Than $100,000 of Bequests of Respondents Who Experience an LTC Shock*



Notes: See Appendix Table A1. Error bars denote the 95 percent confidence interval.
Source: HRS (2002-2016).

Figure 11. *Self-Reported Probability of Leaving More Than $500,000 of Bequests of Respondents Who Experience an LTC Shock*

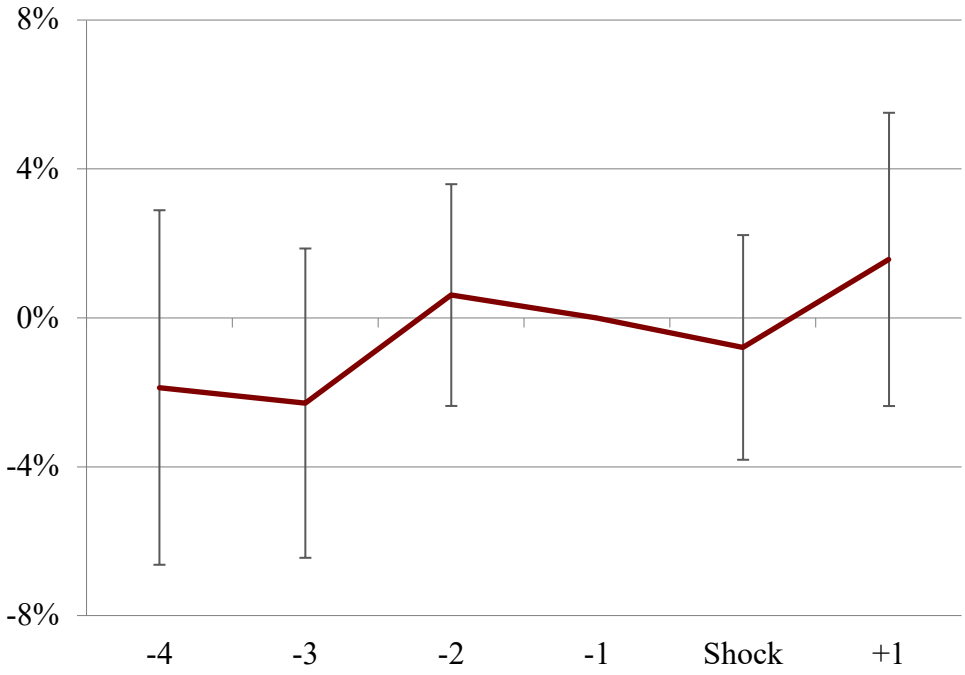


Notes: See Appendix Table A1. Error bars denote the 95 percent confidence interval.
Source: HRS (2002-2016).

Figure 12. *Share of Respondents Who Experience an LTC Shock Living with Their Children*

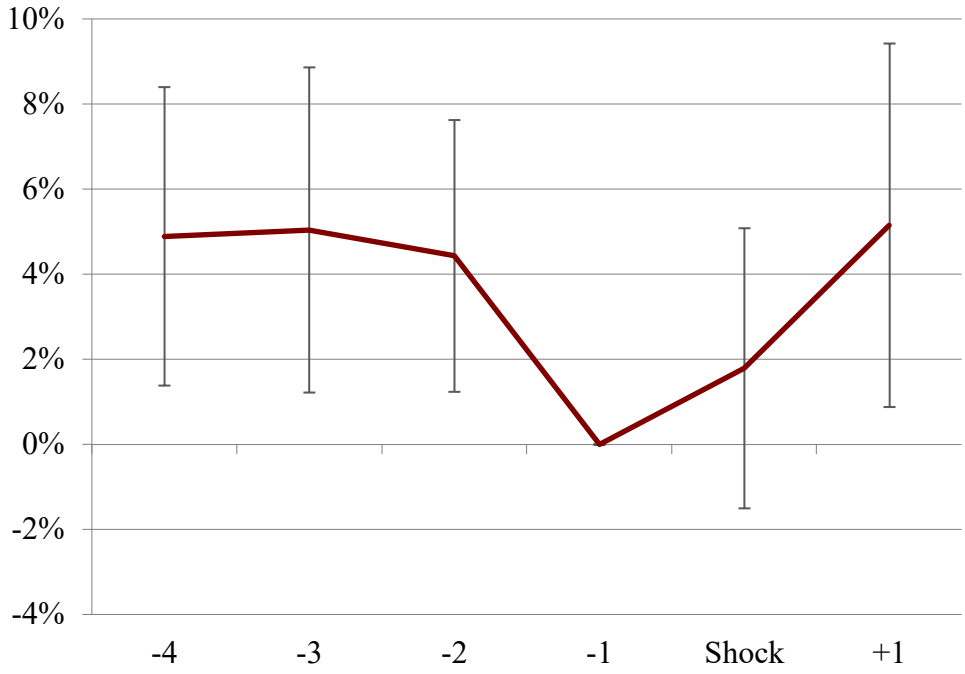
Notes: See Appendix Table A1. Error bars denote the 95 percent confidence interval.
Source: HRS (2002-2016).

Figure 13. *Share of Respondents Who Experience an LTC Shock Living Within 10 Miles of Their Children*



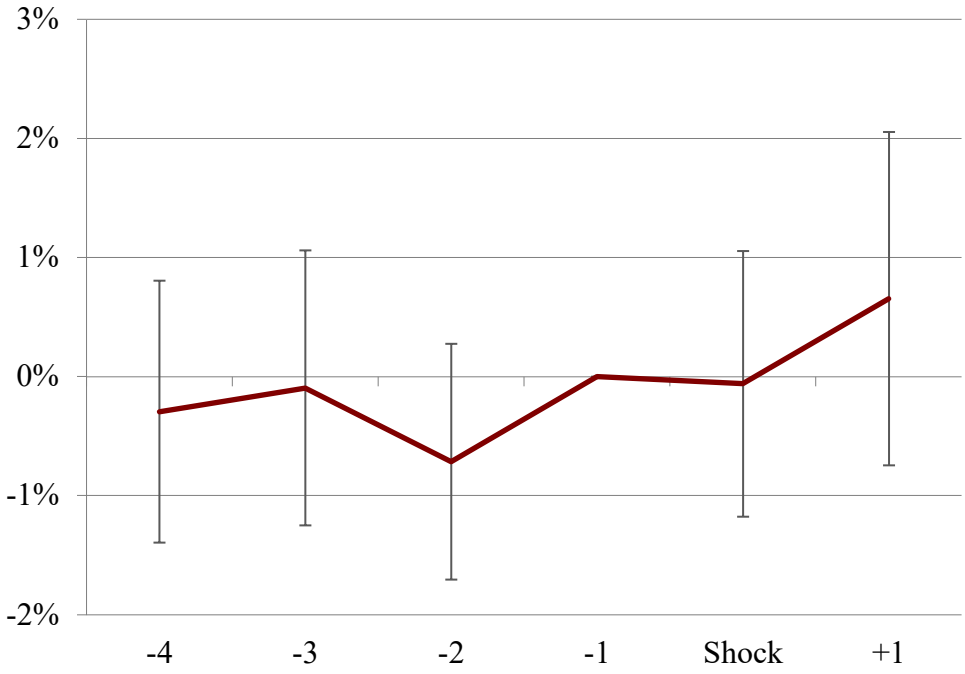
Notes: See Appendix Table A1. Error bars denote the 95 percent confidence interval.
Source: HRS (2002-2016).

Figure 14. *Share of Respondents Who Experience an LTC Shock with Private Health Insurance*



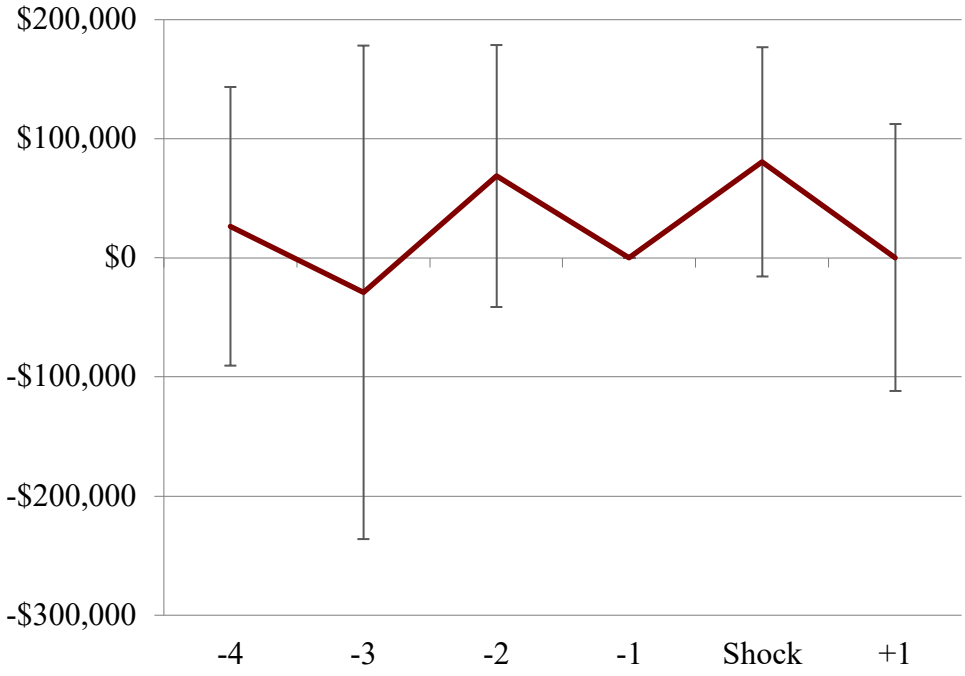
Notes: See Appendix Table A1. Error bars denote the 95 percent confidence interval.
Source: HRS (2002-2016).

Figure 15. *Share of Respondents Who Experience a Medical Shock on Medicaid*



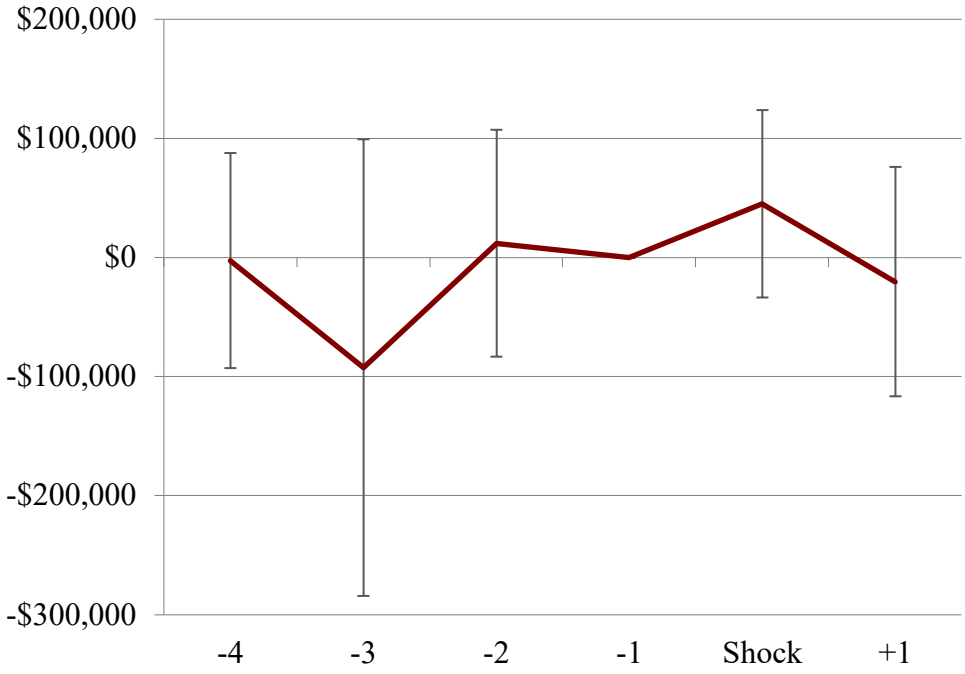
Notes: See Appendix Table A2. Error bars denote the 95 percent confidence interval.
Source: HRS (2002-2016).

Figure 16. *Total Wealth of Respondents Who Experience a Medical Shock*



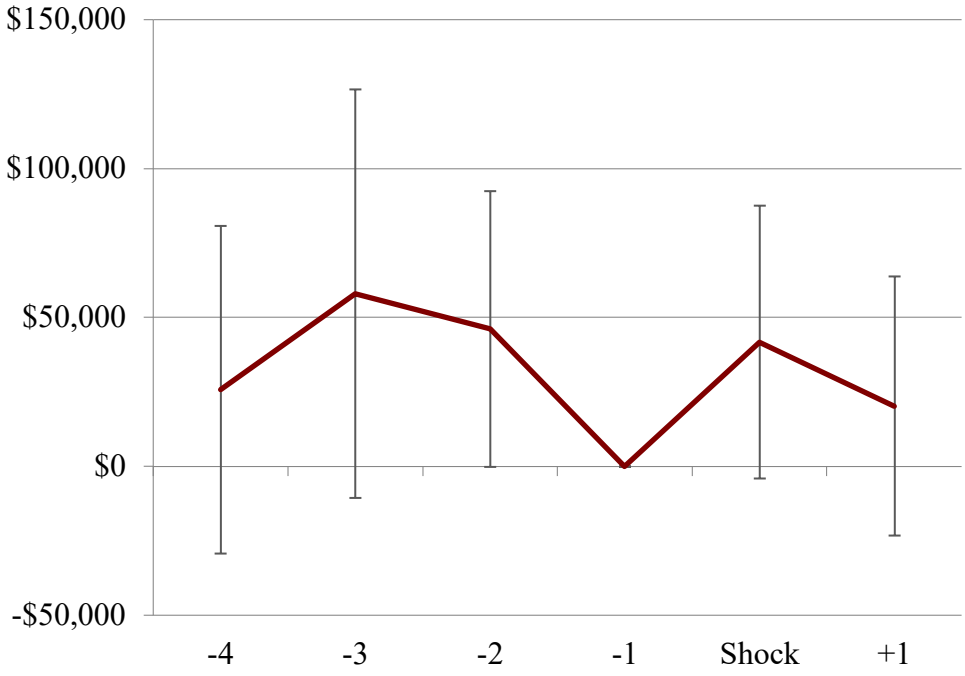
Notes: See Appendix Table A2. Error bars denote the 95 percent confidence interval.
Source: HRS (2002-2016).

Figure 17. *Non-Housing Wealth of Respondents Who Experience a Medical Shock*



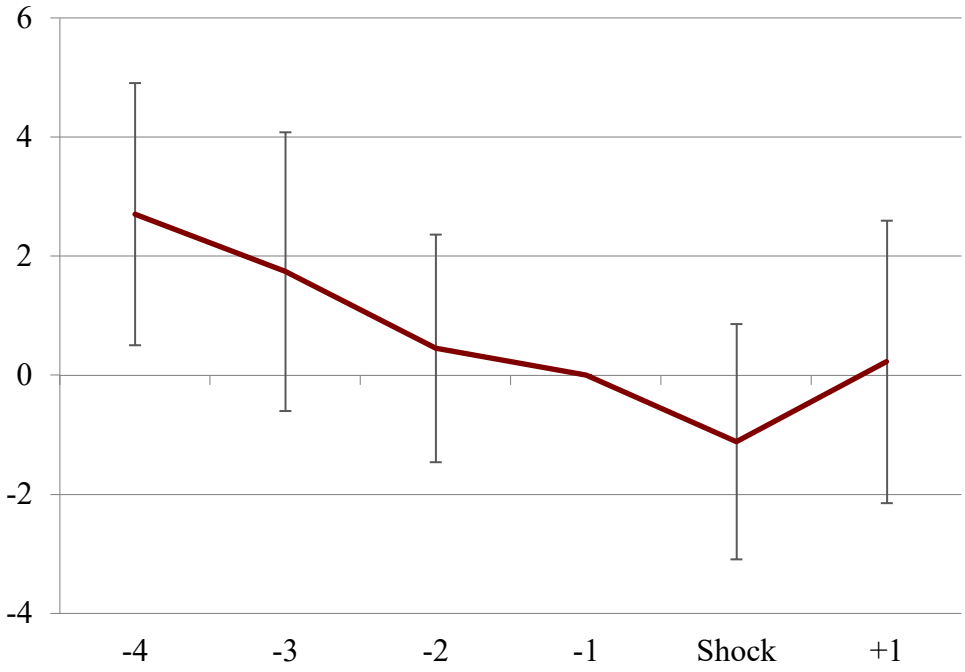
Notes: See Appendix Table A2. Error bars denote the 95 percent confidence interval.
Source: HRS (2002-2016).

Figure 18. *Primary Residence Value of Respondents Who Experience a Medical Shock*



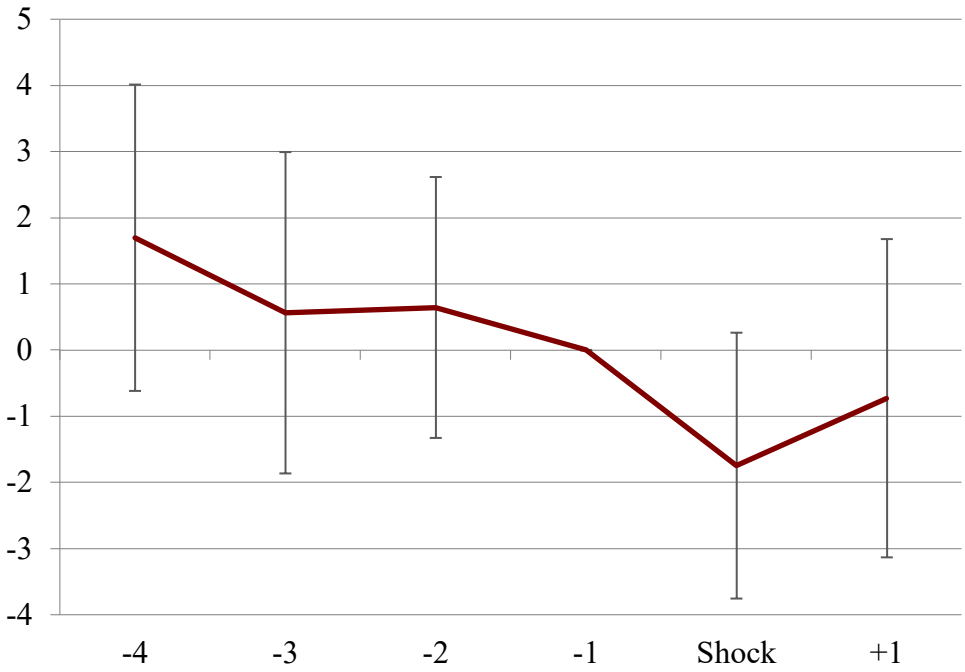
Notes: See Appendix Table A2. Error bars denote the 95 percent confidence interval.
Source: HRS (2002-2016).

Figure 19. *Self-Reported Probability of Leaving More Than $10,000 of Bequests of Respondents Who Experience a Medical Shock*



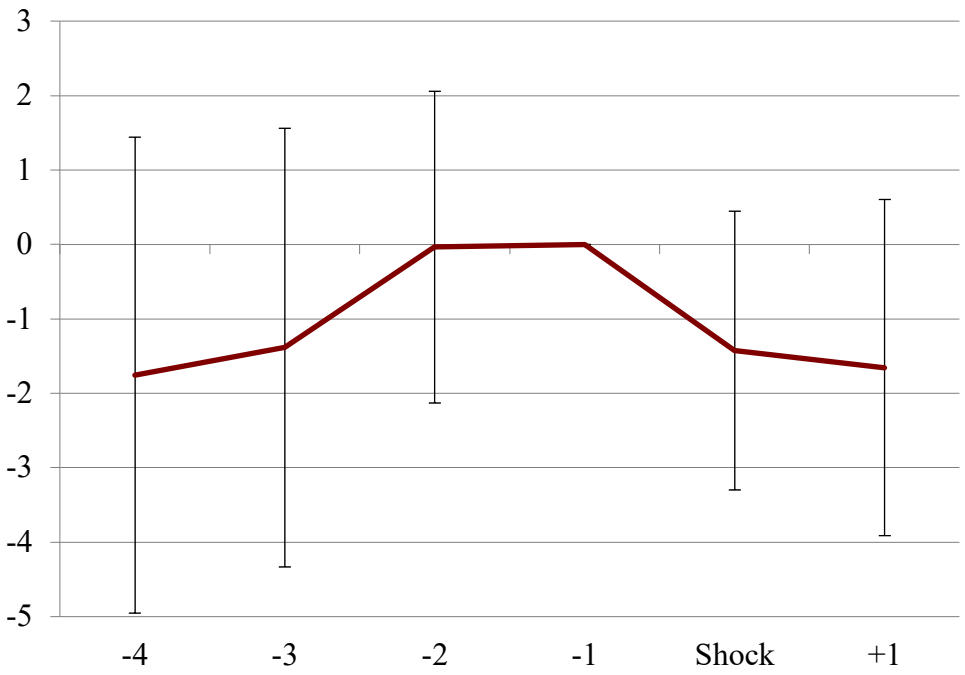
Notes: See Appendix Table A2. Error bars denote the 95 percent confidence interval.
Source: HRS (2002-2016).

Figure 20. *Self-Reported Probability of Leaving More Than $100,000 of Bequests of Respondents Who Experience a Medical Shock*



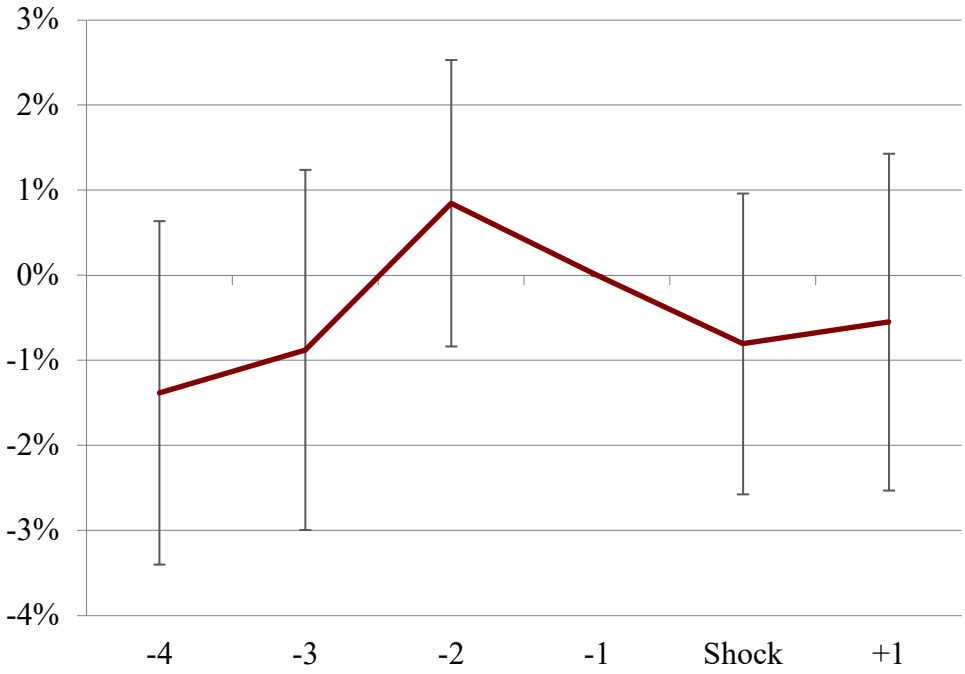
Notes: See Appendix Table A2. Error bars denote the 95 percent confidence interval.
Source: HRS (2002-2016).

Figure 21. *Self-Reported Probability of Leaving More Than $500,000 of Bequests of Respondents Who Experience a Medical Shock*



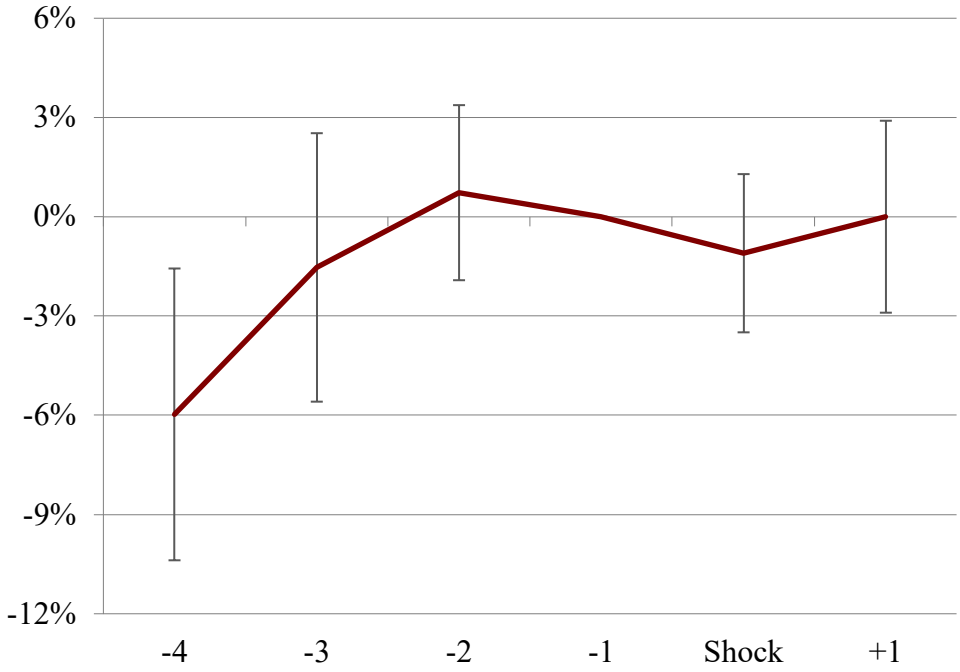
Notes: See Appendix Table A2. Error bars denote the 95 percent confidence interval.
Source: HRS (2002-2016).

Figure 22. *Share of Respondents Who Experience a Medical Shock Living with Their Children*



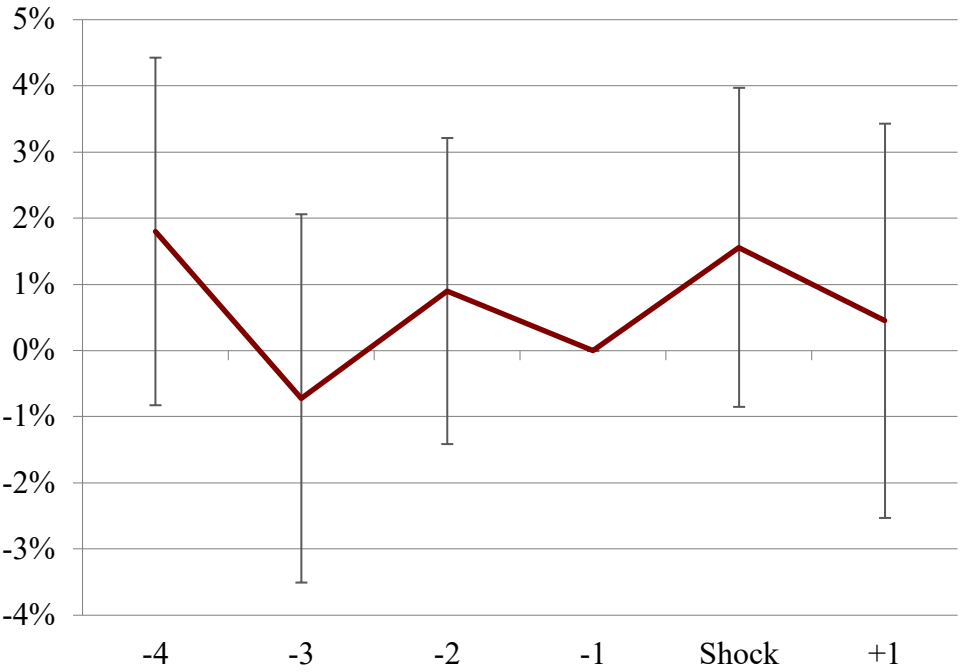
Notes: See Appendix Table A2. Error bars denote the 95 percent confidence interval.
Source: HRS (2002-2016).

Figure 23. *Share of Respondents Who Experience a Medical Shock Living within 10 Miles of Their Children*



Notes: See Appendix Table A2. Error bars denote the 95 percent confidence interval.
Source: HRS (2002-2016).

Figure 24. *Share of Respondents Who Experience a Medical Shock with Private Health Insurance*



Notes: See Appendix Table A2. Error bars denote the 95 percent confidence interval.
Source: HRS (2002-2016).

Table 1. *Demographics of HRS Respondents Who Experience an LTC Shock*

Variable (N=1,894)	Mean	p25	Median	p75	SD
Age	79.76	73	80	86.00	8.69
White	0.87	1	1	1	0.33
Black	0.10	0	0	0	0.30
Other race	0.03	0	0	0	0.17
Hispanic	0.04	0	0	0	0.19
College graduate	0.22	0	0	0	0.41
On Medicaid	0.06	0	0	0	0.23
Has health insurance	0.92	1	1	1	0.27
Has long-term care insurance	0.15	0	0	0	0.35
Has private insurance	0.46	0	0	1	0.50
Total wealth	658,881	77,837	266,754	713,257	1,318,459
Non-housing wealth	457,824	10,297	103,516	423,399	1,163,587
Primary residence value	205,651	0	139,736	264,509	284,445
Probability of >$10,000 bequest	66.67	25	90	100	39.63
Probability of >$100,000 bequest	43.72	0	30	95	43.09
Probability of >$500,000 bequest	18.05	0	0	20	32.58
Live with children	0.06	0	0	0	0.24
Live <10 miles from children	0.51	0	1	1	0.50

Note: Non-demographic variables are measured in the wave before the shock.
Source: HRS (2002-2016).

Table 2. *Demographics of HRS Respondents Who Experience a Medical Shock*

Variable (N=5,419)	Mean	p25	Median	p75	SD
Age	75.17	69	74	81.00	7.60
White	0.89	1	1	1	0.32
Black	0.08	0	0	0	0.27
Other race	0.04	0	0	0	0.18
Hispanic	0.05	0	0	0	0.22
College graduate	0.27	0	0	1	0.44
On Medicaid	0.04	0	0	0	0.19
Has health insurance	0.90	1	1	1	0.30
Has long-term care insurance	0.16	0	0	0	0.37
Has private insurance	0.56	0	1	1	0.50
Total wealth	1,001,395	140,295	428,911	1,022,866	2,271,423
Non-housing wealth	704,128	27,103	172,932	663,745	1,969,936
Primary residence value	299,992	86,264	199,070	364,030	459,184
Probability of >$10,000 bequest	73.39	50	95	100	36.29
Probability of >$100,000 bequest	51.97	0	50	100	43.31
Probability of >$500,000 bequest	25.33	0	0	50	37.00
Live with children	0.05	0	0	0	0.22
Live <10 miles from children	0.51	0	1	1	0.50

Note: Non-demographic variables are measured in the wave of the shock.
Source: HRS (2002-2016).

Table 3. *Healthcare Spending of HRS Respondents*

Population	Cost category	Mean	p25	p50	p75	SD
Long-term care shock (N=1,894)	Total OOP	9,861	2,236	4,812	10,494	16,609
	Total LTC OOP	4,469	177	664	2,912	13,368
	Nursing home	2,859	0	0	1,177	9,703
	At-home services	1,611	0	65	515	9,338
	Special facilities	273	0	0	0	1,728
	Total medical OOP	5,119	1,090	2,943	5,936	8,403
	Hospitals	1,647	0	142	1,213	6,016
	Doctor visits	971	0	166	680	3,633
	Dental costs	581	0	69	484	1,458
	Outpatient surgery	129	0	0	0	668
	Prescription drugs	1,792	309	838	2,096	2,907
Medical shock (N=5,419)	Total OOP	11,809	6,005	7,623	10,921	17,870
	Total LTC OOP	598	0	0	0	6,428
	Nursing home	368	0	0	0	3,690
	At-home services	230	0	0	0	5,130
	Special facilities	87	0	0	0	1,727
	Total medical OOP	11,124	5,906	7,421	10,522	16,480
	Hospitals	1,625	0	0	498	6,767
	Doctor visits	1,513	0	254	1,694	4,365
	Dental costs	1,598	0	349	1,820	3,136
	Outpatient surgery	455	0	0	0	3,339
	Prescription drugs	5,933	813	3,397	6,620	14,592
Full population (N=83,497)	Total OOP	2,424	343	1,065	2,574	7,151
	Total LTC OOP	119	0	0	0	2,365
	Nursing home	79	0	0	0	1,811
	At-home services	40	0	0	0	1,463
	Special facilities	29	0	0	0	651
	Total medical OOP	2,276	335	1,042	2,515	6,610
	Hospitals	209	0	0	0	2,055
	Doctor visits	293	0	7	169	1,368
	Dental costs	459	0	76	398	1,183
	Outpatient surgery	67	0	0	0	928
	Prescription drugs	1,249	0	439	1,236	5,652

Notes: Numbers are annual. For the shock populations, each variable was measured in the wave of the shock. The full population reflects all responses in the HRS in the wave range.
Source: HRS (2002-2016).

Table 4. *Recent Diagnoses of HRS Respondents*

Population	Diagnosis since last wave	Mean	SD
Long-term care shock (N=1,894)	High blood pressure	0.04	0.20
	Diabetes	0.03	0.16
	Cancer	0.05	0.21
	Lung disease	0.05	0.21
	Heart issues	0.09	0.28
	Stroke	0.09	0.28
	Psych problems	0.04	0.21
	Arthritis	0.04	0.19
Medical shock (N=5,419)	High blood pressure	0.05	0.22
	Diabetes	0.04	0.19
	Cancer	0.05	0.22
	Lung disease	0.03	0.16
	Heart issues	0.08	0.27
	Stroke	0.04	0.20
	Psych problems	0.03	0.16
	Arthritis	0.04	0.20
Full population (N=83,497)	High blood pressure	0.04	0.20
	Diabetes	0.03	0.16
	Cancer	0.03	0.16
	Lung disease	0.02	0.14
	Heart issues	0.04	0.20
	Stroke	0.02	0.14
	Psych problems	0.02	0.13
	Arthritis	0.04	0.19

Notes: A "recent diagnosis" is one received since the last wave response. For the shock populations, each variable was measured in the wave of the shock. The full population reflects all responses in the HRS in the wave range.
Source: HRS (2002-2016).

Table 5. *Healthcare Spending After a Shock*

Population	Cost category	Mean	p25	p50	p75	SD
Long-term care shock (N=1,504)	Total OOP	3,210	694	1,638	3,276	5,415
	Total LTC OOP	1,330	0	30	349	4,646
	Nursing home	1,060	0	0	131	4,372
	At-home services	270	0	0	35	1,383
	Special facilities	88	0	0	12	478
	Total non-LTC OOP	1,793	541	1,195	2,226	2,257
	Hospitals	358	0	23	253	1,374
	Doctor visits	289	7	94	334	598
	Dental costs	266	0	85	315	544
	Outpatient surgery	67	0	0	7	330
	Prescription drugs	813	168	487	1,058	1,159
Medical shock (N=4,421)	Total OOP	2,672	713	1,436	2,692	5,741
	Total LTC OOP	683	0	0	0	4,075
	Nursing home	609	0	0	0	3,987
	At-home services	73	0	0	0	636
	Special facilities	41	0	0	0	288
	Total non-LTC OOP	1,948	647	1,302	2,316	3,719
	Hospitals	246	0	0	91	1,102
	Doctor visits	255	0	68	278	555
	Dental costs	364	0	130	423	706
	Outpatient surgery	58	0	0	2	276
	Prescription drugs	1,025	215	546	1,136	3,349

Source: HRS (2002-2016).

Appendix A

Table A1. *Comparison of Treatment Group (shock in wave t) to Control Group (shock in wave t+2), Respondents who Experience a Long-Term Care Spending Shock After 65*

	(1) On Medicaid	(2) Long-term care insurance	(3) Health insurance	(4) Has private insurance
Control: shock-4	0.0279	-0.0386	0.00245	0.178***
	(0.0357)	(0.0348)	(0.0212)	(0.0641)
Control: shock-3	0.0159	-0.0343	0.000298	0.117***
	(0.0246)	(0.0241)	(0.0143)	(0.0432)
Control: shock-2	0.00104	-0.0133	-0.00358	0.0601**
	(0.0133)	(0.0130)	(0.00799)	(0.0234)
Control: wave of shock	-0.0146	0.00476	-0.00464	-0.0629***
	(0.0131)	(0.0125)	(0.00777)	(0.0237)
Control: shock+1	-0.0109	0.0154	-0.00475	-0.152***
	(0.0234)	(0.0230)	(0.0146)	(0.0435)
Treat	-0.0154	0.0159	-0.00595	-0.162***
	(0.0233)	(0.0229)	(0.0146)	(0.0435)
Treat: shock-4	-0.0145	0.00787	0.00241	0.0489***
	(0.00887)	(0.0111)	(0.00635)	(0.0179)
Treat: shock-3	-0.00373	0.0224**	0.00281	0.0504***
	(0.0103)	(0.0109)	(0.00624)	(0.0195)
Treat: shock-2	-0.000934	0.00326	0.00761	0.0443***
	(0.00869)	(0.00838)	(0.00515)	(0.0163)
Treat: wave of shock	0.0659***	0.00952	0.00719	0.0179
	(0.00991)	(0.00817)	(0.00514)	(0.0168)
Treat: shock+1	0.0900***	0.0149	0.00749	0.0515**
	(0.0139)	(0.0107)	(0.00653)	(0.0218)
Constant	-0.234	0.285**	0.898***	0.615***
	(0.209)	(0.127)	(0.0781)	(0.238)
Observations	22,664	22,456	23,041	23,041
R^2	0.545	0.709	0.362	0.558

Notes: Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: HRS (2002-2016).

Table A1. *Comparison of Treatment Group (shock in wave t) to Control Group (shock in wave t+2), Respondents who Experience a Long-Term Care Spending Shock After 65 (continued)*

	(5) Total wealth	(6) Non-housing wealth	(7) Primary residence value
Control: shock-4	-216674.9	-206131.0	6476.4
	(162194.0)	(139730.4)	(42553.5)
Control: shock-3	-134823.0	-140132.0	13025.5
	(116422.9)	(103156.5)	(27652.7)
Control: shock-2	-50577.9	-70104.1	23550.3
	(54590.4)	(46807.9)	(22292.3)
Control: wave of shock	54359.8	55539.9	-9020.4
	(45774.5)	(42044.8)	(11977.8)
Control: shock+1	94497.6	104721.6	-26917.8
	(88924.9)	(81300.7)	(21453.4)
Treat	119620.4	123261.9	-18406.9
	(92931.4)	(82213.9)	(23249.0)
Treat: shock-4	39116.0	17853.6	23022.3*
	(36272.5)	(33636.2)	(13673.2)
Treat: shock-3	26361.5	25435.1	6715.6
	(42482.8)	(40061.6)	(11169.4)
Treat: shock-2	-30571.9	-14022.0	-14168.3
	(27687.5)	(21982.1)	(16758.5)
Treat: wave of shock	-67949.9**	-41434.4	-25461.5**
	(34229.4)	(31550.0)	(11059.9)
Treat: shock+1	-59323.5	-45918.7	-8454.9
	(42801.5)	(35527.9)	(15479.1)
Constant	1349827.1**	1105126.5**	193152.6
	(631912.5)	(551276.0)	(160149.6)
Observations	23,041	23,041	23,041
R^2	0.730	0.690	0.626

Notes: Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: HRS (2002-2016).

Table A1. *Comparison of Treatment Group (shock in wave t) to Control Group (shock in wave t+2), Respondents who Experience a Long-Term Care Spending Shock After 65 (continued)*

	(8) Probability of leaving >$10k	(9) Probability of leaving >$100k	(10) Probability of leaving >$500k
Control: shock-4	4.145	5.504	-0.00435
	(5.706)	(5.488)	(4.988)
Control: shock-3	3.864	4.777	-0.772
	(3.884)	(3.729)	(3.401)
Control: shock-2	2.078	3.105	-0.556
	(2.064)	(1.988)	(1.823)
Control: wave of shock	-2.368	-2.033	-0.501
	(2.145)	(2.015)	(1.827)
Control: shock+1	-4.804	-5.071	0.557
	(3.888)	(3.744)	(3.371)
Treat	-5.338	-5.084	0.388
	(3.886)	(3.736)	(3.392)
Treat: shock-4	3.544**	2.990**	-1.028
	(1.558)	(1.458)	(1.676)
Treat: shock-3	1.514	0.671	0.386
	(1.736)	(1.583)	(1.667)
Treat: shock-2	1.216	0.739	-0.218
	(1.443)	(1.402)	(1.269)
Treat: wave of shock	-3.728**	-3.865**	-0.726
	(1.580)	(1.504)	(1.250)
Treat: shock+1	0.0377	-0.967	-1.706
	(2.002)	(1.935)	(1.591)
Constant	44.92	-3.458	19.02
	(29.36)	(20.37)	(18.90)
Observations	18,435	17,953	12,640
R^2	0.636	0.719	0.738

Notes: Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: HRS (2002-2016).

Table A1. *Comparison of Treatment Group (shock in wave t) to Control Group (shock in wave t+2), Respondents who Experience a Long-Term Care Spending Shock After 65 (continued)*

	(11) Live with children	(12) Live <10 miles from kids
Control: shock-4	-0.0482	0.0865
	(0.0423)	(0.0693)
Control: shock-3	-0.0337	0.0610
	(0.0289)	(0.0459)
Control: shock-2	-0.0240	0.0288
	(0.0157)	(0.0239)
Control: wave of shock	0.0125	-0.00229
	(0.0157)	(0.0240)
Control: shock+1	0.0340	-0.0344
	(0.0286)	(0.0447)
Treat	0.0379	-0.0358
	(0.0285)	(0.0449)
Treat: shock-4	-0.00825	-0.0187
	(0.0125)	(0.0243)
Treat: shock-3	-0.00760	-0.0229
	(0.0136)	(0.0212)
Treat: shock-2	0.00204	0.00613
	(0.0113)	(0.0152)
Treat: wave of shock	0.00347	-0.00793
	(0.0112)	(0.0154)
Treat: shock+1	-0.0173	0.0157
	(0.0144)	(0.0201)
Constant	0.119	0.0734
	(0.169)	(0.307)
Observations	19,980	16,672
R^2	0.243	0.726

Notes: Standard errors in parentheses.
Source: HRS (2002-2016).

Table A2. *Comparison of Treatment Group (shock in wave t) to Control Group (shock in wave t+2), Respondents who Experience a Medical Spending Shock After 65*

	(1) On Medicaid	(2) Long-term care insurance	(3) Health insurance	(4) Has private insurance
Control: shock-4	-0.0272	-0.0564*	0.00578	0.162***
	(0.0193)	(0.0289)	(0.0188)	(0.0440)
Control: shock-3	-0.0187	-0.0426**	0.00691	0.123***
	(0.0130)	(0.0199)	(0.0129)	(0.0300)
Control: shock-2	-0.00805	-0.0175	-0.00142	0.0547***
	(0.00737)	(0.0110)	(0.00705)	(0.0167)
Control: wave of shock	0.00568	0.0107	-0.00412	-0.0647***
	(0.00740)	(0.0109)	(0.00720)	(0.0169)
Control: shock+1	0.0195	0.0236	-0.00263	-0.111***
	(0.0133)	(0.0197)	(0.0125)	(0.0298)
Treat	0.0206	0.0275	-0.00529	-0.123***
	(0.0131)	(0.0195)	(0.0125)	(0.0295)
Treat: shock-4	-0.00293	0.0153	-0.00364	0.0180
	(0.00561)	(0.0104)	(0.00687)	(0.0134)
Treat: shock-3	-0.000936	0.0145	-0.00222	-0.00722
	(0.00589)	(0.00990)	(0.00638)	(0.0142)
Treat: shock-2	-0.00713	0.00222	0.00286	0.00900
	(0.00505)	(0.00746)	(0.00481)	(0.0118)
Treat: wave of shock	-0.000599	0.00504	0.00112	0.0156
	(0.00569)	(0.00696)	(0.00472)	(0.0123)
Treat: shock+1	0.00655	0.00775	-0.000639	0.00450
	(0.00714)	(0.00826)	(0.00543)	(0.0152)
Constant	0.121**	0.189*	0.973***	0.705***
	(0.0597)	(0.111)	(0.0947)	(0.142)
Observations	39,356	38,846	39,687	39,687
R^2	0.488	0.671	0.411	0.566

Notes: Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: HRS (2002-2016).

Table A2. *Comparison of Treatment Group (shock in wave t) to Control Group (shock in wave t+2), Respondents who Experience a Medical Spending Shock After 65 (continued)*

	(5) Total wealth	(6) Non-housing wealth	(7) Primary residence value
Control: shock-4	-98141.5	-172713.0	76570.9
	(166904.2)	(144246.9)	(64086.2)
Control: shock-3	56253.2	28770.4	30768.1
	(129211.9)	(116888.7)	(38873.0)
Control: shock-2	-82789.9	-73633.4	-4716.2
	(66575.8)	(59158.8)	(16574.7)
Control: wave of shock	-78831.6	-9789.2	-73704.9
	(73266.9)	(55937.2)	(47136.0)
Control: shock+1	-27903.6	83705.8	-109037.6
	(129773.9)	(103065.6)	(75936.6)
Treat	-26277.9	79440.0	-103922.3
	(127617.6)	(103144.8)	(73097.4)
Treat: shock-4	26544.2	-2493.6	25755.4
	(59677.7)	(46068.2)	(28069.1)
Treat: shock-3	-28903.5	-92378.5	57997.3*
	(105696.2)	(97808.4)	(34998.8)
Treat: shock-2	68761.5	12041.8	46141.9*
	(56108.2)	(48600.7)	(23624.9)
Treat: wave of shock	80659.3	45137.1	41761.1*
	(49106.5)	(40144.2)	(23373.5)
Treat: shock+1	389.2	-20158.3	20306.0
	(57176.2)	(49126.1)	(22198.7)
Constant	937996.0	1001146.4*	-12359.0
	(642338.2)	(594572.7)	(217265.8)
Observations	39,687	39,687	39,687
R^2	0.583	0.527	0.492

Notes: Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: HRS (2002-2016).

Table A2. *Comparison of Treatment Group (shock in wave t) to Control Group (shock in wave t+2), Respondents who Experience a Medical Spending Shock After 65 (continued)*

	(8) Probability of leaving >$10k	(9) Probability of leaving >$100k	(10) Probability of leaving >$500k
Control: shock-4	9.634***	2.082	-0.0602
	(3.655)	(3.920)	(4.031)
Control: shock-3	6.531***	1.212	-0.259
	(2.504)	(2.674)	(2.798)
Control: shock-2	4.363***	1.362	-0.294
	(1.386)	(1.489)	(1.493)
Control: wave of shock	-3.367**	-0.0384	0.781
	(1.412)	(1.461)	(1.467)
Control: shock+1	-8.199***	-1.882	1.152
	(2.474)	(2.633)	(2.682)
Treat	-8.204***	-2.016	1.340
	(2.469)	(2.627)	(2.694)
Treat: shock-4	2.705**	1.698	-1.755
	(1.123)	(1.181)	(1.631)
Treat: shock-3	1.740	0.565	-1.385
	(1.194)	(1.239)	(1.503)
Treat: shock-2	0.452	0.645	-0.0358
	(0.975)	(1.006)	(1.068)
Treat: wave of shock	-1.114	-1.744*	-1.424
	(1.008)	(1.025)	(0.955)
Treat: shock+1	0.225	-0.726	-1.653
	(1.210)	(1.227)	(1.152)
Constant	35.82***	27.81**	18.05
	(12.64)	(13.69)	(12.38)
Observations	34,477	33,683	21,508
R2	0.632	0.717	0.784

Notes: Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: HRS (2002-2016).

Table A2. *Effect of a Medical Shock on Respondents After 65 (continued)*

	(11) Live with children	(12) Live <10 miles from kids
Control: shock-4	0.0274	-0.00981
	(0.0333)	(0.0559)
Control: shock-3	0.0190	-0.0262
	(0.0230)	(0.0380)
Control: shock-2	-0.0000457	-0.0173
	(0.0124)	(0.0208)
Control: wave of shock	0.000322	0.0254
	(0.0129)	(0.0195)
Control: shock+1	-0.0152	0.0331
	(0.0225)	(0.0358)
Treat	-0.00981	0.0390
	(0.0225)	(0.0358)
Treat: shock-4	-0.0138	-0.0597***
	(0.0103)	(0.0225)
Treat: shock-3	-0.00876	-0.0153
	(0.0108)	(0.0207)
Treat: shock-2	0.00848	0.00729
	(0.00859)	(0.0135)
Treat: wave of shock	-0.00805	-0.0110
	(0.00902)	(0.0122)
Treat: shock+1	-0.00549	0.0000250
	(0.0101)	(0.0148)
Constant	0.0976	0.361**
	(0.143)	(0.154)
Observations	35,685	25,804
*R*2	0.247	0.759

Notes: Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: HRS (2002-2016).

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