Online Appendices for Finkelstein, Luttmer and Notowidigdo: "What Good is Wealth Without Health? The Effect of Health on the Marginal Utility of Consumption"

Online Appendix A: Derivations and Extensions of the Theoretical Model

Determination of optimal savings

We now prove the claim from Section 3.1 that individuals' second-period wealth is proportional to their lifetime income and we determine the proportionality factor w. We first calculate expected second-period utility as a function of second-period wealth by taking the weighted average of equations (4) and (8), where the weights are the 1-p and p respectively. This yields:

$$E_1\left[U_2\right]=\left(\frac{(1-p)}{1-\gamma}+p\left(\frac{1+\varphi_1}{1-\gamma}\left(1+\varphi_2^{1/\gamma}(1+\varphi_1)^{-1/\gamma}(1-b)^{1-1/\gamma}\right)^{\gamma}\right)\right)W^{1-\gamma}=kW^{1-\gamma}, \quad \text{(A.1)}$$

where the constant k is defined by:

$$k\equiv\frac{(1-p)}{1-\gamma}+p\left(\frac{1+\varphi_1}{1-\gamma}\left(1+\varphi_2^{1/\gamma}(1+\varphi_1)^{-1/\gamma}(1-b)^{1-1/\gamma}\right)^{\gamma}\right). \quad \text{(A.2)}$$

We use the intertemporal budget constraint $W = (1+r)(Y(1-\tau) - C_1)$ to express expected second-period utility as a function of first-period consumption:

$$E_1\left[U_2\right]=kW^{1-\gamma}=k\big((1+r)\big(Y(1-\tau)-C_1\big)\big)^{1-\gamma}. \quad \text{(A.3)}$$

Substituting equation (A.3) into the lifetime utility function (1) yields:

$$U=\left(\tfrac{1}{1-\gamma}\right)\left(C_1^{1-\theta}+\tfrac{1}{1+\delta}\big((1-\gamma)k\big)^{(1-\theta)/(1-\gamma)}\big((1+r)\big(Y(1-\tau)-C_1\big)\big)^{(1-\theta)}\right)^{(1-\gamma)/(1-\theta)} \quad \text{(A.4)}$$

We now have expressed lifetime utility as a function of a single choice parameter, C_1. Setting the derivative of (A.4) with respect to C_1 to zero yields:

$$C_1=\frac{\big((1-\gamma)k\big)^{(\theta-1)/\theta(1-\gamma)}(1-\tau)}{\big((1-\gamma)k\big)^{(\theta-1)/\theta(1-\gamma)}+(1+\delta)^{\theta}(1+r)^{-\theta-1}}\times Y\equiv c_1Y, \quad \text{(A.5)}$$

where the constant c_1 is defined by:

$$c_1\equiv\frac{\big((1-\gamma)k\big)^{(\theta-1)/\theta(1-\gamma)}(1-\tau)}{\big((1-\gamma)k\big)^{(\theta-1)/\theta(1-\gamma)}+(1+\delta)^{\theta}(1+r)^{-\theta-1}}. \quad \text{(A.6)}$$

Equation (A.5) establishes that first-period consumption is proportional to lifetime income Y.

Substituting (A.5) into the intertemporal budget constraint demonstrates second-period wealth must therefore also be proportional to lifetime income:

$$W = (1+r)\big(Y(1-\tau) - C_1\big) = (1+r)\big(Y(1-\tau) - c_1 Y\big) = (1+r)\big(1-\tau-c_1\big)Y \equiv wY\,, \tag{A.7}$$

where the constant of proportionality w is defined by:

$$w = (1+r)\big(1-\tau-c_1\big)\,. \tag{A.8}$$

Generalization of the model for a free choice of the health services elasticity

In Section 3.1, we chose the functional form for the health subutility function $\Psi(H)$ to be a power function with exponent $1-\gamma$. This choice of functional form substantially simplified the exposition, but restricted ε, the substitution elasticity of consumption and health services, to be equal to minus the inverse of the coefficient of relative risk aversion. We now demonstrate that allowing for an arbitrary, but constant, substitution elasticity of consumption and health services yields an estimating equation for state dependence that is identical to equation (14) derived in Section 3.1. In other words, our estimates of state dependence do not depend on the value of the substitution elasticity of consumption and health services. The intuition behind this result is that our estimating strategy does not rely on variation in the relative price of consumption and health services, and therefore does not depend on the elasticity of consumption choices with respect to this relative price. The substitution elasticity of consumption and health services is of course important in our simulations of the effect of state dependence on optimal insurance. In those simulations, we use the more general model described below. Note that all equations below reduce to the equations described in Section 3.1 when $\varepsilon = -1/\gamma$.

We generalize the second-period subutility function by replacing the power functional form of equation (2) by a CES functional form:

$$U_2 = \left(\tfrac{1}{1-\gamma}\right)(1+\tilde{\varphi}_1 S)\left[C_2^{1+1/\varepsilon} + \tilde{\varphi}_2 S H^{1+1/\varepsilon}\right]^{\left(\frac{1-\gamma}{1+1/\varepsilon}\right)}. \tag{A.9}$$

In the CES formulation, the degree of state dependence in the marginal utility of consumption (evaluated at a constant level of consumption) depends on the level of health services consumed. Hence, state dependence, φ_1, is a function both of the dependence of the utility function on health, as measured by the parameter $\tilde{\varphi}_1$, and of the relative price of health services. We derive the relationship between φ_1 and $\tilde{\varphi}_1$ by first calculating the marginal utility of consumption in the healthy and in the sick state:

$$dU_{2,S=0} / dC_2 = C_2^{-\gamma} \quad \text{and} \tag{A.10}$$

$$dU_{2,S=1} / dC_2 = (1+\tilde{\varphi}_1)\left[C_2^{1+1/\varepsilon} + \tilde{\varphi}_2 H^{1+1/\varepsilon}\right]^{\left(\frac{1-\gamma}{1+1/\varepsilon}-1\right)} C_2^{1/\varepsilon}\,. \tag{A.11}$$

Taking the ratio of (A.11) to (A.10) and simplifying yields:

$$(1+\varphi_1) \equiv \frac{dU_{2,S=1} / dC_2}{dU_{2,S=0} / dC_2} = (1+\tilde{\varphi}_1)\left[1+\tilde{\varphi}_2\left(H / C_2\right)^{1+1/\varepsilon}\right]^{\left(\frac{1-\gamma}{1+1/\varepsilon}-1\right)}. \tag{A.12}$$

In the CES formulation for the utility function, the marginal utility of health services depends not only on the level of health services but also on the state dependence parameter and non-health consumption:

$$dU_{2,S=1} / dH = (1+\tilde{\varphi}_1)\tilde{\varphi}_2\left[C_2^{1+1/\varepsilon}+\tilde{\varphi}_2 H^{1+1/\varepsilon}\right]^{\left(\frac{1-\gamma}{1+1/\varepsilon}-1\right)} H^{1/\varepsilon} \tag{A.13}$$

For consistency with the power utility formulation, we define φ_2 as the marginal utility of health scaled by $H^{1/\varepsilon}$:

$$\varphi_2 \equiv \frac{dU_{2,S=1} / dH}{H^{1/\varepsilon}} = (1+\tilde{\varphi}_1)\tilde{\varphi}_2\left[C_2^{1+1/\varepsilon}+\tilde{\varphi}_2 H^{1+1/\varepsilon}\right]^{\left(\frac{1-\gamma}{1+1/\varepsilon}-1\right)} \tag{A.14}$$

When we vary φ_1 in our simulations (see online Appendix C), we hold φ_2 constant at the initial levels of C_2 and H. We use equations (A.12) and (A.14) to solve for the values for $\tilde{\varphi}_1$ and $\tilde{\varphi}_2$ such that φ_2 remains constant and φ_1 varies as desired.

To derive our estimating equation, we follow the same strategy as in Section 3.1. We start by solving for the optimal consumption choices in period 2 given second-period wealth *W*:

$$\underset{C_2,H}{\text{Max}}\, U_2(C_2,H) = \underset{C_2,H}{\text{Max}}\left(\tfrac{1}{1-\gamma}\right)(1+\tilde{\varphi}_1 S)\left[C_2^{1+1/\varepsilon}+\tilde{\varphi}_2 S H^{1+1/\varepsilon}\right]^{\left(\frac{1-\gamma}{1+1/\varepsilon}\right)} \tag{A.15}$$

$$\text{s.t. } C_2 + (1-b)H = W$$

Conditional on being sick, the resulting optimal consumption and health services are given by:

$$C_2 = \frac{W}{1+(1-b)^{\varepsilon+1}\tilde{\varphi}_2^{-\varepsilon}} \text{ and} \tag{A.16}$$

$$H = \frac{(1-b)^{\varepsilon}\tilde{\varphi}_2^{-\varepsilon} W}{1+(1-b)^{\varepsilon+1}\tilde{\varphi}_2^{-\varepsilon}}. \tag{A.17}$$

Substituting (A.16) and (A.17) into the second-period utility function yields second-period utility as a function of second-period wealth for sick individuals (*S*=1):

$$U_2 = \left(\tfrac{1}{1-\gamma}\right)(1+\tilde{\varphi}_1)\left(1+(1-b)^{\varepsilon+1}\tilde{\varphi}_2^{-\varepsilon}\right)^{\left(\frac{\gamma-1}{1+\varepsilon}\right)} W^{1-\gamma}. \tag{A.18}$$

Second-period utility for healthy individuals (*S*=0) is:

$$U_2 = \left(\tfrac{1}{1-\gamma}\right) W^{1-\gamma} \tag{A.19}$$

We calculate expected second-period utility as the weighted average of equations (A.18) and (A.19). So expected utility is:

$$E_1\left[U_2\right] = \left(\frac{(1-p)}{1-\gamma} + p\left(\frac{1+\tilde{\varphi}_1}{1-\gamma} \left(1+(1-b)^{\varepsilon+1}\tilde{\varphi}_2^{-\varepsilon}\right)^{\left(\frac{\gamma-1}{1+\varepsilon}\right)} \right)\right) W^{1-\gamma} = \tilde{k} W^{1-\gamma} \tag{A.20}$$

where the constant $\tilde{k}$ is defined by:

$$\tilde{k} \equiv \frac{(1-p)}{1-\gamma} + p\left(\frac{1+\tilde{\varphi}_1}{1-\gamma} \left(1+(1-b)^{\varepsilon+1}\tilde{\varphi}_2^{-\varepsilon}\right)^{\left(\frac{\gamma-1}{1+\varepsilon}\right)} \right). \tag{A.21}$$

We use the intertemporal budget constraint $W = (1+r)(Y(1-\tau) - C_1)$ to express expected second-period utility as a function of first-period consumption:

$$E_1\left[U_2\right] = \tilde{k} W^{1-\gamma} = \tilde{k}\left((1+r)\left(Y(1-\tau)-C_1\right)\right)^{1-\gamma}. \tag{A.22}$$

Substituting equation (A.22) into the lifetime utility function (1) yields:

$$U = \left(\tfrac{1}{1-\gamma}\right)\left(C_1^{1-\theta} + \tfrac{1}{1+\delta}\left((1-\gamma)\tilde{k}\right)^{(1-\theta)/(1-\gamma)} \left((1+r)\left(Y(1-\tau)-C_1\right)\right)^{(1-\theta)} \right)^{(1-\gamma)/(1-\theta)} \tag{A.23}$$

We now have expressed lifetime utility as a function of a single choice parameter, C_1. Setting the derivative of (A.23) with respect to C_1 to zero yields:

$$C_1 = \frac{\left((1-\gamma)\tilde{k}\right)^{(\theta-1)/\theta(1-\gamma)}(1-\tau)}{\left((1-\gamma)\tilde{k}\right)^{(\theta-1)/\theta(1-\gamma)} + (1+\delta)^{\theta}(1+r)^{-\theta-1}} \times Y \equiv (1-s^*)(1-\tau)Y \equiv \tilde{c}_1 Y, \tag{A.24}$$

where s^* denotes the optimal savings rate and where the constant $\tilde{c}_1$ is defined by:

$$\tilde{c}_1 \equiv \frac{\left((1-\gamma)\tilde{k}\right)^{(\theta-1)/\theta(1-\gamma)}(1-\tau)}{\left((1-\gamma)\tilde{k}\right)^{(\theta-1)/\theta(1-\gamma)} + (1+\delta)^{\theta}(1+r)^{-\theta-1}}. \tag{A.25}$$

Equation (A.24) establishes that first-period consumption is proportional to lifetime income Y. Substituting (A.24) into the intertemporal budget constraint demonstrates second-period wealth must therefore also be proportional to lifetime income:

$$W = (1+r)\left(Y(1-\tau) - C_1\right) = (1+r)\left(Y(1-\tau) - \tilde{c}_1 Y\right) = (1+r)\left(1-\tau-\tilde{c}_1\right)Y \equiv \tilde{w}Y \, , \tag{A.26}$$

where the constant of proportionality $\tilde{w}$ is defined by:

$$\tilde{w} = (1+r)\left(1-\tau-\tilde{c}_1\right). \tag{A.27}$$

Substituting $W = \tilde{w}Y$ into equations (A.18) and (A.19), yields indirect utility, $v(Y,S)$, in the second period for the healthy state and the sick state, respectively:

$$v(Y,0) = \frac{1}{1-\gamma}(\tilde{w}Y)^{1-\gamma} \text{, and} \tag{A.28}$$

$$v(Y,1) = \frac{1}{1-\gamma}(1+\tilde{\varphi}_1)\left(1+(1-b)^{\varepsilon+1}\tilde{\varphi}_2^{-\varepsilon}\right)^{\left(\frac{\gamma-1}{1+\varepsilon}\right)}\left(\tilde{w}Y\right)^{1-\gamma}. \tag{A.29}$$

These indirect utility functions suggest a nonlinear regression of the following form:

$$v = \beta_1 S \times Y^{\beta_2} + \beta_3 Y^{\beta_2} + \varepsilon \, , \tag{A.30}$$

which yields the parameter estimates:

$$\beta_1 = (1+\tilde{\varphi}_1)\left(1+(1-b)^{\varepsilon+1}\tilde{\varphi}_2^{-\varepsilon}\right)^{\left(\frac{\gamma-1}{1+\varepsilon}\right)}\frac{\tilde{w}^{1-\gamma}}{1-\gamma} - \frac{\tilde{w}^{1-\gamma}}{1-\gamma}, \quad \beta_2 = 1-\gamma \, , \quad \text{and } \beta_3 = \frac{\tilde{w}^{1-\gamma}}{1-\gamma}. \tag{A.31}$$

Taking the ratio of the incremental income gradient of utility in the sick state (β_1) to the income gradient in the healthy state (β_3) yields:

$$\beta_1 / \beta_3 = (1+\tilde{\varphi}_1)\left(1+(1-b)^{\varepsilon+1}\tilde{\varphi}_2^{-\varepsilon}\right)^{\left(\frac{\gamma-1}{1+\varepsilon}\right)} - 1 \, . \tag{A.32}$$

Using equation (A.12) to replace $\tilde{\varphi}_1$ by φ_1 yields:

$$\beta_1 / \beta_3 = (1+\varphi_1)\left[1+\tilde{\varphi}_2\left(H / C_2\right)^{1+1/\varepsilon}\right]^{\left(1-\frac{1-\gamma}{1+1/\varepsilon}\right)}\left(1+(1-b)^{\varepsilon+1}\tilde{\varphi}_2^{-\varepsilon}\right)^{\left(\frac{\gamma-1}{1+\varepsilon}\right)} - 1 \, . \tag{A.33}$$

Taking the ratio of equations (A.17) to (A.16) shows that $m \equiv H / C_2 = (1-b)^{\varepsilon}\tilde{\varphi}_2^{-\varepsilon}$. Substituting this expression into equation (A.33) and simplifying yields:

$$\beta_1 / \beta_3 = (1+\varphi_1)\left[1+(1-b)^{\varepsilon+1}\tilde{\varphi}_2^{-\varepsilon}\right]^{\gamma} - 1 = (1+\varphi_1)\left[1+m(1-b)\right]^{\gamma} - 1 \, . \tag{A.34}$$

This equation is identical to equation (14) in Section 3.1. Hence, the inference of state dependence φ_1 from the parameter ratio β_1/β_3 is the same regardless of the elasticity of substitution between consumption and health services.

Online Appendix B: Data Appendix

I. Health and Retirement Study

Our analysis uses data from all cohorts (and their spouses) in the first seven waves of the HRS. The original HRS cohort is surveyed in every even year starting in 1992. The AHEAD cohort is surveyed in 1993, 1995, 1996, 1998, 2000, 2002 and 2004. The War Baby and CODA cohorts are surveyed in 1998, 2000, 2002 and 2004. For more detail on the data and the sample see http://hrsonline.isr.umich.edu/intro/index.html**.** We use the RAND HRS data set, which is a "cleaned, easy-to-use, streamlined version" (http://hrsoline.isr.umich.edu/meta/r/and/), and merge in some additional variables that are needed.

Sample selection:

- Aged 50 and older. This restriction is only binding for spouses, since the HRS only sampled main respondents age 50 and older.
- Not in labor force. We define individuals as not in the labor force if they (1) self-report that they are either retired or that the retirement question is "not applicable" (presumably reflecting no serious prior labor market attachment) and (2) have annual earnings of less than $5,000. Since the retirement question is not asked in the 1994/1995 waves, we include individuals in this wave if they meet the criteria in the prior wave.
- Have health insurance. We define an individual as having health insurance if she is covered by any private or public insurance.
- We require that the individual maintain her retirement status and insurance coverage while she is in the sample. Individuals who do not initially meet these criteria can enter our sample in subsequent waves if they subsequently meet the criteria, but we drop all spells in the sample that do not terminate with the last observation of the individual meeting the sample selection criteria.[1]
- We exclude the bottom percentile of the permanent income (defined below) distribution from our analysis, given the potential sensitivity of the coefficient on the log of permanent income (which we use in our baseline specification) to such outliers. In practice, including these individuals does not have a substantive effect on the results.
- Finally, we require that the individual appear in the baseline sample for more than one wave, and only use person-years where the key variables have non-missing values.

Treatment of death and divorce:

- Death: When people die they exit the sample, and we keep pre-death observations in the sample (i.e., we do not select the sample based on being able to observe people until the last wave). Once a survey respondent enters the panel, most of the attrition comes through death, though there is also attrition for unknown reasons, as well. Roughly 70% of the person-years in our baseline sample are observed in the final wave (i.e., they do not die or leave survey for another reason).

- Divorce: Regarding divorce, we calculate household income each wave based on the

[1] As a specification check, we also define a sample where once an individual enters the sample, the individual remains in the sample indefinitely regardless of changes to health insurance and retirement status, and the results are extremely similar. As an additional specification check, we applied the sample criteria on a year-by-year basis, and again find very similar results.

current spouse (if any). If a couple divorces, then in the next wave we will compute household income based on the new household (including income from the new spouse, if any), and we average across the household income value in the sample period to construct the permanent income proxy measure. Divorce and separation are not very prevalent in the HRS data. 83% of the baseline sample has the same spouse throughout.

Variable definitions

- *Annual household income (adjusted for household composition)*: Total annual household income is the sum of household income from wages and salaries, capital income (business income, dividend and interest income, and other asset income), pensions, government transfers, and other sources. We also add 5% of the household's current financial wealth (that is, total household wealth not including housing or automobile) to this aggregate household income measure to account for the fact that elderly households may be spending down their accumulated financial savings; results are unaffected if we instead assume a 10% or 0% "drawdown" rate of financial wealth. We use the OECD adjustment for household size (Atkinson et al. 1995), dividing total household income by 1.7 if the respondent is married and living with a spouse in the same household in that wave.
- *Permanent income*: Average across all waves of annual household income (adjusted for household composition in the same manner)
- *Measures of chronic disease*: At the respondent's first interview, the question is "Has a doctor ever told you that you had *X*", where *X* stands for hypertension, diabetes, cancer, heart disease, chronic lung disease, stroke, and arthritis. Only if the respondent answers "no," the question is asked again in subsequent waves using the following wording: "Since we last talked to you, that is since [last interview date], has a doctor told you that you have *X*". These variables have been coded in the RAND data set to be absorbing states.
- *Wealth measure* (used in Appendix Table A7 column 3 as an alternative measure of permanent income): The wealth measure used is constructed by averaging household wealth across all waves in which a household appears. The measure of wealth we use excludes net housing wealth and automobile wealth. It includes the sum of the net value of financial wealth (e.g., stocks, mutual funds, investment trusts, checking, savings, money markets, CD's, T-bills) and other savings and assets minus non-housing and non-automobile debts. We limit the sample to households with more than $1,000 in wealth, which results in a roughly 20% reduction in sample size from the baseline sample.

Consumption and Activities Mail Survey (CAMS)

The Consumption and Activities Mail Survey (CAMS), a small topical module administered to about 30% of households in the HRS for three waves, allows us to construct a broad-based measure of total consumption as well as non-durable consumption. These consumption measures include out-of-pocket medical expenditures, so they can be considered proxies for second-period wealth. The CAMS survey was mailed to 5,000 households selected at random from the 13,214 households in HRS 2000; they received 3,866 respondents in 2001 and followed up with the respondent sample in 2003 and 2005 to form a household-level panel data set on consumption. We use all three waves of CAMS, matching each to the preceding HRS survey years since the CAMS asks about consumption in the previous year. The survey asks about 6 "big-ticket" durable consumption items and 26 non-durable consumption categories that are modeled after the Consumer Expenditure Survey (CEX) and designed to encompass the exhaustive set of non-durable consumption categories in the CEX. We follow Hurd and Rohwedder (2005) to construct measures of total consumption and total non-durable consumption; they also provide more detail on the survey and the underlying data.

Whenever specifications using CAMS data include household fixed effects, we create a new household fixed effect any time the household composition changes (either through changes in household size or changes in identity of respondent's spouse).

II. Medical Expenditure Panel Survey (MEPS)

The Medical Expenditure Panel Survey allows us to compute the out-of-pocket health expenditure as a share of non-health consumption, $m(1-b)$, for the various samples used in Table 3. In all computations, we use total out-of-pocket health expenditures, as reported by the individual. This measure includes all health expenditures for office- and hospital-based care, home health care, dental services, vision services, and prescribed medicine. We use data from the 1996 MEPS limited to individuals who meet the same sample selection criteria as we applied to our HRS sample. As with the HRS above, our baseline sample selection criteria are the following: individuals who are age 50 and older, are not in the labor force (either retired or non-working), and have health insurance. We use this sample to compute the difference in mean out-of-pocket health spending for those whose medical spending is above the median and those whose medical spending is below the median. We scale this difference by the mean annual consumption, determined using the HRS CAMS survey (described above). Alternative sample selection criteria are described in Table 3, and we follow these same criteria in the MEPS when computing the out-of-pocket health expenditure share for each sample. Sample sizes for the three samples are 2,556, 1,898 and 488, respectively.

Online Appendix C: Details of the Calibrations

The model in the main text imposes that the elasticity of substitution between health services consumption and non-health consumption (ε) and the coefficient of relative risk aversion (γ) are related through $\varepsilon = -1/\gamma$. While this restriction simplifies the exposition and is inconsequential for our empirical estimating equation, we do not want to impose this restriction in our calibration exercises. For the calibrations, we therefore use the generalized model from Appendix A (equations A.9 onwards). The optimal savings rate, s^*, is a direct outcome of this model (see equation A.24), and we define the optimal level of health insurance b^* as the level of b that maximizes lifetime utility (from equation 1) if individuals treat b and τ as given and the tax rate τ is set to satisfy the government budget constraint in expectation.[2] To implement the calibration, we choose parameter values based on the empirical literature, as described below. We use the same parameter values for the savings calibration as for the optimal insurance calibration.

There are two sources of uncertainty which affect expected utility in period 2: (i) uncertainty about future health status (i.e., agent enters sick state with probability p) and (ii) uncertainty about the rate of return on savings (r). We choose a probability of the sick state (p) of 0.5 so that our measure of the sick state is whether or not an individual has below-median health. To compute the distribution of returns on savings, we use the following procedure. First, we compute real annual returns on the S&P 500 between 1889 and 2008 using data from Shiller (1989)[3]. Next, we create 1000 counterfactual 25-year returns by sampling these annual returns with replacement. We assume that the return on savings is statistically independent of the random variable governing the consumer's future health status, and we use these two sources of uncertainty to compute expected utility in period 2 given the consumer's choice of savings in period 1.

We choose $\varepsilon = -0.20$, which matches the empirical estimates from the RAND Health Insurance Experiment (Manning et al., 1987). We parameterize the two-period model so that the periods are 25 years apart. We use an annual discount rate of 2.7% (Barro, 2009), which gives $\delta = (1.027)^{25} - 1$. We choose this value of δ for our baseline value of risk aversion and for a value of θ such that we have an expected utility function ($\gamma = \theta = 3$). For other values of γ and θ, we choose δ so that the optimal savings rate (s^*) with no state dependence ($\varphi_1 = 0$) is the same across all values of γ and θ. This ensures that the *effective* rate of time preference is the same in all simulations (Barro, 2009).

For each combination of γ and θ, we calibrate φ_2, the parameter that governs the level of demand for health services, such that the ratio of health services consumption to non-medical consumption matches the empirically observed ratio m of 0.236 at the empirically observed level of insurance b of 0.851 when $\varphi_1 = 0$.[4] We keep φ_2 constant at this level as we vary φ_1 and allow

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[2] The expectation is over the probability of falling sick and over the real interest rate realization. Numerically, we implement this by starting with $\tau = 0$, and iteratively choosing taxes such that in expectation the government budget is balanced (given candidate optimal savings level).

[3] We use the updated data that Shiller has posted on his website: http://www.econ.yale.edu/~shiller/data.htm.

[4] We compute b, the average degree of insurance coverage, using the 1996 Medical Expenditure Panel Survey (MEPS) data set, imposing the same sample restrictions as in the HRS sample. For these individuals, we compute average share of out-of-pocket health expenditures as a fraction of total health expenditures, and subtract this share from one to obtain b. We compute m ($=H/C_2$) based on data on the distribution of health spending and the distribution of annual household consumption. Since H is the incremental health spending associated with becoming sick, we approximate it using data from the 1996 MEPS based on the difference in mean medical spending for those whose medical spending is above the median ($10,194) and those whose medical spending is below the median ($704). Using the consumption data in the CAMS survey (described in more detail in Appendix B), we find that

m and b^* to be determined endogenously.

As we noted in Appendix A (between equations A.9 and A14), state dependence φ_1 in the generalized model depends not only on primitive parameters of the generalized model ($\tilde{\varphi}_1, \tilde{\varphi}_2$, ε, and γ) but also on the endogenous ratio of health to non-health consumption. Similarly, the valuation of health services φ_2 depends not only on primitive parameters of the generalized model ($\tilde{\varphi}_1, \tilde{\varphi}_2$, ε, and γ) but also on the levels of health services consumption and non-medical consumption. For each combination of γ and θ, we set $\tilde{\varphi}_1$ and $\tilde{\varphi}_2$ such that φ_1 takes on its desired value (0.0, –0.2, or –0.4) and φ_2 remains constant at the level described above for the baseline choices of health services consumption and non-medical consumption (see equations A.12 and A.14 in Appendix A for the system of equations which we jointly solve numerically; the baseline choices of health services consumption and non-medical consumption are defined by the empirically observed ratio m of 0.236 and the baseline savings rate at φ_1=0). Finally, in a non-expected utility framework, the savings rate also responds to the level of second-period utility (not just to marginal utility in the second period). To ensure that changes in φ_1 only affect savings behavior through its effect on marginal utility, we add a constant to equation A.9 in the sick state such that the level of second-period utility for our baseline ratio of health services consumption to non-medical consumption of 0.236 in the sick state remains constant within each combination of γ and θ as we vary φ_1.

In the savings calibrations presented in Table 8, we set the level of insurance b equal to its empirically observed level of 0.851 and solve for the optimal savings rate s^* as φ_1 takes on the values 0, –0.2, or –0.4. For the optimal insurance calibrations presented in Table 9, we solve the same model as in the savings calibrations but do this for the range of possible values of b. We report as the optimal insurance level b^* the value that maximizes lifetime utility. As before, the individual treats b and τ as exogenous, and τ is set such that the government budget constraint is satisfied in expectation.

mean annual consumption is $41,648. Consumption in the CAMS is calculated on a household basis, so we converted consumption to an individual-level measure using the OECD adjustment for household composition (see Appendix B for details). Dividing the difference in average health spending (between average spending for those above and below the median) by mean annual non-health consumption gives m = 0.236.

Online Appendix D: Semiparametric Estimator of the Mapping *g*(.)

We generalize the standard probit model by flexibly estimating a nonlinear, monotonic transfer function $h(v)$. In our application, this transfer function maps von Neumann-Morgenstern utility v to the latent variable in a probit model with a binary subjective well-being outcome variable, *HAPPY*:

$$HAPPY_i = \begin{cases} 1 & \text{if} \quad h(v_i) > \eta_i \\ 0 & \text{if} \quad h(v_i) \leq \eta_i \end{cases},$$

where η_i is a standard normal error term. The transfer function $h(v)$ is specified as a ninth-order polynomial that is constrained to be monotonically increasing using the rearrangement technique of Chernozhukov, Fernandez-Val, and Galichon (2009). Without loss of generality, we normalize $h(0)=0$ and $h'(0)=1$. We impose utility v to have the amount of curvature that corresponds to a coefficient of relative risk aversion of γ:

$$v_i = \pi_1 \frac{\bar{Y}_i^{1-\gamma}}{1-\gamma} + \pi_0 ,$$

where π_1 and π_0 are parameters to be estimated. The polynomial coefficients and π_1 and π_0 are estimated by maximizing the following log likelihood function:

$$\max_{h(.),\pi_0,\pi_1} \sum_{i,t} \left(HAPPY_{it} \times \log(\Phi(h\left(\pi_1 \frac{\bar{Y}_i^{1-\gamma}}{1-\gamma} + \pi_0 \right))) + (1 - HAPPY_{it}) \times \log(1 - \Phi(h\left(\pi_1 \frac{\bar{Y}_i^{1-\gamma}}{1-\gamma} + \pi_0 \right))) \right),$$

where $\Phi(.)$ denotes the standard normal cumulative density function. The outcome of this maximization problem is an estimated transfer function $\hat{h}(.)$, which will depend on our choice of γ.

Next, we define the mapping from our von Neumann-Morgenstern utility measure v to the utility proxy *HAPPY* as $\hat{g}(.) = \Phi(\hat{h}(.))$. We use the estimated mapping $\hat{g}(.)$ and set $\beta_2 = 1-\gamma$ when we estimate equation (15), which identifies state dependence by the interaction between permanent income and health in a panel model with individual fixed effects. We estimate equation (15) by maximum likelihood. Finally, using our estimated fixed effects, we estimate equation (16), which identifies the marginal utility of permanent income (β_3).

We report bootstrapped standard errors clustered by individual for two reasons. First, this is a three-step estimator – the first step estimates $h(.)$, the second step estimates β_1, fixed effects (α_is), and other parameters given $\hat{h}(.)$, and the third step estimates β_3 given the fixed effect estimates. Second, we are most interested in the magnitude of state dependence ($\sigma\beta_1/\beta_3$) and bootstrapping allows us to take into account the covariance between β_1 and β_3, which are estimated in two separate equations. A single iteration of the three-step estimator takes about 4 hours to run, so we only run 100 iterations to compute our bootstrapped standard errors. We report p-values based on asymptotic t-tests constructed from our point estimate and the bootstrapped standard errors.

Appendix E: Estimates of State Dependence when Second-Period Wealth Varies with Health

We model the effect of health on second-period wealth by allowing the individual to receive a state-dependent income flow in the second period. In particular, let the individual receive *net* income $\tilde{N}(S)$ in period 2 (in addition to the permanent income Y received in period 1). We think of $\tilde{N}(S)$ as consisting of effects of health on labor income and household production, informal transfers from friends and family that depend on health status, or resources that would have otherwise been used on an outside state-independent consumption good (that falls outside out formal model, such as bequests).

The lifetime budget constraint now becomes: $Y(1-\tau) = C_1 + \frac{1}{1+r}(C_2 + (1-b)H - \tilde{N}(S))$. Further, assume that $\tilde{N}(0) = 0$, and $\tilde{N}(1) = N$. The introduction of state-dependent income does not alter the individual's choice between consumption goods and health services except that second-period wealth in the sick state is now $W+N$ instead of W. Updating equations (4) and (8) from Section 3.1 accordingly, we find that second-period utility is now given by:

$$U_2 = \frac{1}{1-\gamma} W^{1-\gamma} \quad \text{if healthy and} \tag{E.1}$$

$$U_2 = \frac{1}{1-\gamma}(1+\varphi_1)\left(1+(1+\varphi_1)^{-1/\gamma}(1-b)^{1-1/\gamma}\varphi_2^{1/\gamma}\right)^{\gamma}(W+N)^{1-\gamma} \quad \text{if sick.} \tag{E.2}$$

Since W is chosen before the random variable health status is realized, W is independent of health status for any individual. We now express the effect of health on the marginal utility of wealth as a fraction of the marginal utility of wealth in the healthy state. Note, however, that the level of second-period wealth is not held constant in this ratio of marginal utilities (due to the state-dependent income):

$$\frac{\frac{dU_{2,S=1}}{dW} - \frac{dU_{2,S=0}}{dW}}{\frac{dU_{2,S=0}}{dW}} = (1+\varphi_1)\left(1+(1+\varphi_1)^{-1/\gamma}(1-b)^{1-1/\gamma}\varphi_2^{1/\gamma}\right)^{\gamma}(1+N/W)^{-\gamma} - 1. \tag{E.3}$$

We simplify this expression by defining net income shocks n as a fraction of second-period wealth (so $n=N/W$), dividing equation (6) by (7), substituting the resulting expression into (E.3), and rearranging:

$$\frac{dU_{2,S=1}/dW - dU_{2,S=0}/dW}{dU_{2,S=0}/dW} = \left(1+(1-b)m\right)^{\gamma}(1+\varphi_1)\left(1+n\right)^{-\gamma} - 1. \tag{E.4}$$

This expression corresponds to equation (14) in Section 3.1, except for the inclusion of the term $(1+n)^{-\gamma}$, which takes into account that wealth is not held constant when comparing the marginal utility of wealth in the healthy and sick state. Specifically, because the elasticity of marginal utility with respect to consumption (or wealth) is $-\gamma$, the marginal utility of wealth (or consumption) in the sick state increases whenever state-dependent income causes wealth (or consumption) in the sick state to fall.

Equation (E.4) also gives insight into the optimal level of state-dependent income. This income should depend on health such that the marginal utility of wealth is equalized across states of the world. So, the optimal level of net state-dependent income is:

$$n^* = \left(1+\varphi_1\right)^{1/\gamma}(1+(1-b)m)-1 \approx \varphi_1/\gamma + (1-b)m \,. \tag{E.5}$$

Thus, absent state dependence ($\varphi_1 = 0$), the optimal level of state-dependent income equals the co-payments for medical services, i.e., it is optimal to receive a lump-sum income transfer in the sick state that is sufficient to cover the co-payments. However, if the marginal utility of consumption is lower in poor health ($\varphi_1 < 0$), then the optimal lump-sum transfer in the sick state is less than the co-payments. Similarly, if $\varphi_1 > 0$, the lump-sum payment would exceed the co-payments so that non-medical consumption is higher when sick than when healthy.

Even though we cannot obtain a closed form solution for W when there is state-dependent income, it is clear that second-period wealth is increasing in permanent income. We parameterize this relationship as $W = \rho_0 Y^{\rho_1}$, with $\rho_0 > 0$ and $\rho_1 > 0$. Modeling second-period resources as a monotonically increasing function of permanent income also captures cases in which the effective interest rate, discount rate, or probability of diseases varies by permanent income. It follows that second-period indirect utility, $v(Y,S)$, equals:

$$v(Y,0) = \frac{1}{1-\gamma}W^{1-\gamma} = \frac{\rho_0^{1-\gamma}}{1-\gamma}Y^{(1-\gamma)\rho_1} \text{, and} \tag{E.6}$$

$$\begin{aligned} v(Y,1) &= \frac{1}{1-\gamma}(1+\varphi_1)\left(1+\varphi_2^{1/\gamma}(1+\varphi_1)^{-1/\gamma}(1-b)^{1-1/\gamma}\right)^{\gamma}\left((1+n)W\right)^{1-\gamma} \\ &= \frac{\rho_0^{1-\gamma}}{1-\gamma}(1+\varphi_1)\left(1+\varphi_2^{1/\gamma}(1+\varphi_1)^{-1/\gamma}(1-b)^{1-1/\gamma}\right)^{\gamma}\left(1+n\right)^{1-\gamma}Y^{(1-\gamma)\rho_1} \end{aligned} \,. \tag{E.7}$$

Thus, running the regression given by equation (11) yields the following estimate for the parameter ratio β_1/β_3:

$$\beta_1/\beta_3 = (1+\varphi_1)\left(1+\varphi_2^{1/\gamma}(1+\varphi_1)^{-1/\gamma}(1-b)^{1-1/\gamma}\right)^{\gamma}\left(1+n\right)^{1-\gamma}-1 \tag{E.8}$$

This expression is the same as our original expression for the parameter ratio (equation (13) in Section 3.1), but now includes the term $(1+n)^{1-\gamma}$. Dividing equation (6) by (7) and substituting the resulting expression into (E.8) yields:

$$\beta_1/\beta_3 = (1+\varphi_1)\left(1+m(1-b)\right)^{\gamma}\left(1+n\right)^{1-\gamma}-1 \approx \varphi_1 + \gamma m(1-b) + n(1-\gamma) \tag{E.9}$$

This expression formalizes the intuition developed from Figure 2 concerning the bias from having net state-dependent income. If $\gamma = 1$, the ratio β_1/β_3 yields an unbiased estimate of the state dependence in the marginal utility of wealth (evaluated at constant wealth), even in the presence of state-dependent net income shocks. For γ>1, the bias has the opposite sign as the sign of the net state-dependent income shocks. So, if negative health shocks reduce wealth (as seems likely), then the true degree of state dependence in the marginal utility of wealth evaluated at constant wealth is more negative (or less positive) than our estimated parameter ratio β_1/β_3. Since state-dependent income does not affect the correction factor $\left(1+m(1-b)\right)^{-\gamma}$ by which the ratio of marginal utilities of wealth needs to be multiplied to obtain the ratio of marginal utilities of consumption, the direction of the bias of state-dependent income on the effect of health on the marginal utility of consumption has the same sign as bias in the effect of health on the marginal utility of wealth.

In certain cases, individuals may be able to choose the level of net state-dependent income. This may occur if there are well functioning (informal) insurance networks or if the individual has an outside good of which the utility does not dependent on health. In such cases, individuals would set n such that the marginal utility of wealth is equalized across health states, so $n^* = \left(1+\varphi_1\right)^{1/\gamma}(1+(1-b)m)-1$. Substituting this expression into equation (E.9) yields:

$$\beta_1 / \beta_3 = \left[(1+\varphi_1)\left(1+m(1-b)\right)^{\gamma}\right]^{1/\gamma} - 1\,. \tag{E.10}$$

As before, there is no bias if γ=1 because in that case equation (E.10) reduces to equation (14). If γ>1, the estimate of state dependence in the marginal utility of wealth is biased towards zero. To see this, note that if the expression between square brackets is raise to a power $1/\gamma<1$, the right-hand side of equation (E.10) becomes closer to zero. This implies that the parameter ratio β_1/β_3 will be biased towards zero if state-dependent income is chosen optimally.

We can also model predictable or temporary health changes in this framework. Individuals who can predict health changes will adjust their savings such that the marginal utility of second-period wealth is equal to the marginal utility of first-period wealth. Such individuals can effectively self-insure, so we can think of them as selecting n such that the marginal utility of wealth is equalized across periods.

Appendix F: Robustness Checks and Additional Results

This section reports additional results summarized in the main text. Summary statistics for additional variables discussed in this section can be found in Appendix Tables A1 and A2. These tables show summary statistics for the two samples reported in Table 2.

We organize the robustness analysis by considering alternative specifications and "single deviations" from our baseline specification in terms of making one change to the baseline specification at the time (changing one variable, changing the functional form, or changing the sample, but not multiple changes at the same time). Further robustness checks that involve multiple deviations from our baseline specification are presented in Tables B1 through B10.

Alternative specifications

Appendix Table A3 reports the results from several sensitivity analyses of the baseline specifications of Table 2. Columns 1 replicates our baseline results from Table 2 for the age 50+ sample and column 6 replicates our baseline results for the age 65+ sample. As before, both samples are limited to those not in the labor force ("NILF") and with health insurance. Subsequent columns always report results for one specified change relative to each baseline. To facilitate comparability of the magnitude of state-dependent utility across these and later analyses, the bottom row reports the implied percent change in marginal utility for a healthy person associated with a one-standard-deviation decline in health (i.e., $\sigma\beta_1/\beta_3$). This provides a scale-free way of comparing different estimates.

Columns 2 and 7 show that the results are not sensitive to excluding the demographic controls (X_{it}). Columns 3 and 8 restrict the analysis to individuals who are always single. Since three-fifths of our sample is married, our estimates are potentially confounded by correlations in health changes within a couple and by any effects that spousal health has on one's own marginal utility. As shown in columns 3 and 8, the point estimate of state dependence is still negative among "always single" individuals, though since it is based on just a third of the original sample, the estimate is no longer statistically significant. We also note that the estimate for this subsample is not statistically significantly different from the baseline specification either; we therefore conclude that we are unable to statistically distinguish the results for the "always single" sample from the rest of the baseline sample. Columns 4 and 9 show that the estimate of β_1 is practically unaffected by adding additional covariates for spousal health and the interaction of spousal health with log permanent income. Interestingly, the results suggest that while a deterioration in spousal health has a similar impact on an individual's utility as a deterioration in own health, a deterioration in spousal health has no detectible effect on an individual's marginal utility.

Whether reported happiness adapts to health shocks affects the interpretation of our coefficients. The existence and extent of happiness adaptation to health shocks is debated in the literature. For example, Lucas (2007) using multi-level methods that are common in the psychology literature claims there is little adaptation to disability shocks. Oswald and Powdthavee (2008) find no adaptation in random effects models but do find evidence of partial adaptation in fixed effects models (30% to 50% adaptation). Given that the adaptation to health shocks is not quite settled in the literature, we examined the role of adaptation in columns 5 and 10. We do this by adding as additional regressors to the baseline specification: number of diseases in the previous wave (so two years earlier) and number of diseases in the previous wave interacted with permanent income. In neither column are these lagged regressors statistically significant. In both columns, the lagged number of diseases has a negative coefficient, which is the opposite of what adaptation predicts. So, we find no evidence for adaptation or even an indication of adaption. The coefficient on the lagged interaction term is negative in column 5, positive in column 10, and insignificant in both columns. In short, we find no evidence of an effect of adaptation on our estimate of state dependence but we recognize that the standard errors on the lagged regressors are relatively large, so we cannot rule out sizeable adaptation effects either.

The effect of onset of individual diseases on marginal utility of consumption

Our approach yields an estimate of the average effect of deteriorating health on the marginal utility of consumption in a representative sample of the elderly and near elderly. This is the economically relevant parameter for savings and health insurance decisions; indeed, we consider it a strength of our approach that it yields estimates of the average effect of common health conditions in the population on the marginal utility of consumption. However, because the marginal utility of consumption may not change with the onset of each disease in the same way, we also examine the effect on marginal utility of each disease separately. Of course, the estimated effect of the onset of a particular measured disease will also capture effects of unmeasured health conditions that are correlated with that disease.

Appendix Table A4 presents estimates from a single regression equation in which we interact each of the seven disease dummies with the log of permanent income and include all seven interaction terms and the seven disease dummies. The first seven columns give the estimates on the interaction term and the disease dummy for each of the seven diseases. The coefficient on permanent income as well as the prevalence-weighted averages of the estimates of the first seven columns are presented in the eighth column. Not surprisingly, the precision of the estimates for specific diseases is often considerably worse than the precision of the estimates when we have an aggregate measure of disease. Indeed, we estimate statistically significant state dependence only for blood pressure and lung disease. Nonetheless, with the exception of heart disease and arthritis, the point estimates on the interaction terms are all negative; moreover, we are unable to reject at the 10% level the hypothesis that all seven interaction terms are equal (p-value = 0.131). In the final column, we show that the prevalence-weighted sum of the seven interaction terms from this specification is statistically significant and that the magnitude (–10.5%) is very similar to our baseline result of –11.2%.[5]

Symptomatic versus asymptomatic diseases

In Appendix Table A5, we investigate whether the drop in marginal utility differs between symptomatic and asymptomatic diseases. In column 1, we classify lung disease, stroke, arthritis, and cancer as symptomatic diseases and high blood pressure, heart disease, and diabetes as asymptomatic diseases. A priori, one might expect to find stronger effects of symptomatic than asymptomatic diseases on marginal utility. However, we find no evidence that the effect of an additional disease is different for symptomatic and asymptomatic diseases (p-value = 0.590). In column 2, we show that the results are similar if cancer is instead classified as an asymptomatic disease (p-value = 0.682). While we are reluctant to make too much of results that are not statistically different, these findings could arise if asymptomatic diseases proxy for other health conditions that are not captured by our set of chronic diseases. For this reason, we tend to see our health measures as proxies for overall health rather than the causal effects of the particular diseases going into our index.

[5] Prevalence-weighting is based on the person-years in the baseline sample that have the disease dummy turned on.

Tests for nonlinear effects

We also examine whether the magnitude of the drop in marginal utility from an additional disease depends on the number of diseases that the individual already has. In Appendix Table A6, we find no evidence of such nonlinearities and cannot reject the hypothesis that the effect of an additional disease is the same for each number of pre-existing diseases. In particular, because the number of diseases has a thin right tail, we run three specifications that differ in our treatment of the right tail. In the specification in column 2, we group those with 6 or more (out of a possible 7) diseases together. In column 3, we group 5 or more diseases together, and in column 4, we group 4 or more diseases together. In none of these three specifications are we able to reject the null of a linear effect of the number of diseases on marginal utility (p-values are respectively: 0.355, 0.453, and 0.282).

Alternative measures of key variables

Appendix Table A7 investigates the sensitivity of our results to alternative measures of our key variables. Columns 2 and 3 show that we continue to estimate negative and statistically significant state dependence (i.e., $\beta_1 < 0$) if we replace our permanent income measure $\bar{Y}$ with education and wealth, respectively, which are other reasonable proxies for consumption opportunities; in both columns, the magnitude of our estimate of state dependence (i.e., $\sigma\beta_1/\beta_3$ shown in the bottom row) is slightly larger than in the baseline estimate.

Columns 4 through 7 show that we continue to obtain negative and usually at least marginally statistically significant estimates of state dependence if, instead of our baseline measure of the number of chronic diseases, we use other standard measures of health, including (respectively) limitations to activities of daily living (ADLs), limitations to instrumental activities of daily living (IADLs), other functional limitations (OFLs), and a health index measure in the spirit of Dor et al. (2006) in which we sum the three limitation measures and the individual's reported pain score.

The last two columns of Table A7 report results for alternative utility proxies. In addition to the baseline utility proxy (the subjective well-being question "Much of the past week I felt happy [yes or no]?"), the HRS contains seven other items from Radloff's (1977) CES-D depression scale. These items have a similar format but instead of "I felt happy" substitute "I enjoyed life", "I felt sad", "I felt lonely", "I felt depressed", "I felt that everything I did was an effort", "my sleep was restless", and "I could not get going". We code these 0/1 measures such that 1 corresponds to higher utility and define a *CESD-8* variable as the sum of the answers over these eight questions. We also follow Smith et al. (2005) by defining a subjective well-being measure *CESD-4* that consists of the sum of answers to the first four items from the Radloff scale; these focus more on happiness and less on the feelings more typically associated with depression or stress.[6]

Columns 8 and 9 of Table A7 report results of estimating equations (15) and (16) using *CESD-8* and *CESD-4* respectively as our utility proxy. Both have desirable properties for a utility proxy in that they both decline with worsening health (i.e., $\beta_4 < 0$) and increase with permanent income (i.e., $\beta_3 > 0$). Most importantly, both indicate a decline in the marginal utility of permanent income associated with deteriorating health, i.e., $\beta_1 < 0$, though this decline is only

[6] We report the pairwise correlations across the alternative utility proxies and across the alternative measures of health in Appendix Table A15.

statistically significant for *CESD-8*. The bottom row of Table A7 shows that the magnitude of the estimated state dependence (i.e., $\sigma\beta_1/\beta_3$) is somewhat smaller than in our baseline, although it lies within the baseline's 95-percent confidence interval.[7]

Appendix Table A8 repeats the analyses of Table A7, except now on the sample of individuals age 65+ rather than the sample age 50+. The results of Table A8 are broadly similar to the ones in Table A7.

Differential trends over time in utility by permanent income

If the consumption path of the poor increases more (or declines less) than that of the rich, this tendency could show up in our estimates as negative state dependence. Since the number of diseases increases over time, it could look like the rich have a greater drop in utility with the onset of a disease simply due to different trends in underlying utility. Reassuringly, we find suggestive evidence that the consumption path of the poor declines (in percentage terms) relative to that of the rich over time, though our preferred estimate in column 1 of Appendix Table A9 is not statistically significant at conventional levels ($p = 0.200$). If we limit the sample to those who are always single (column 2), we also find that the consumption path of the poor declines relative to that of the rich over time, and now the estimate is statistically significant ($p = 0.015$). As columns (3) and (4) show, the results are similar for non-durable consumption. Overall, Table A9 suggests that, if anything, the consumption path of the poor declines relative to the rich, which would bias us against our finding negative state dependence.

An alternative way to investigate this issue would be to add an interaction of permanent income with time (or equivalently, current age) to our baseline specification. Unfortunately, the high collinearity between time and the onset of a disease makes it hard to disentangle the two effects; not surprisingly, our estimate of the interaction of permanent income with health becomes extremely imprecise (see columns 3 and 6 of Appendix Table A10).

Differential effects of other time-varying covariates by permanent income

Our estimates of the differential effect of health changes by permanent income may in part capture differential effects of other time-varying covariates by permanent income. We therefore allowed the effect of permanent income to vary not only with number of diseases but also with martial status and with household size. As shown in columns 2 and 5 of Appendix Table A10, the estimate of the interaction term of permanent income and number of diseases remains roughly similar in magnitude to our baseline estimate (reproduced in columns 1 and 4), but is now only significant at the 10-percent level in column 2 and insignificant in column 5. Columns 3 and 6 show that if we further include an interaction with age, the point estimate of state dependence moves considerably. However, the estimate is also extremely imprecise and not statistically different from our baseline estimate. In other words, we do not have the statistical power to clearly distinguish the effect of aging and the effect of health deteriorations on marginal utility.

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[7] Smith et al. (2005) compare the impact of moving from no ADL limitations to at least two ADL limitations on CESD-4 by household net worth. They find that those with below-median net worth experience a significantly larger drop in subjective well-being as a result of acquiring two ADL limitations than those with above-median net worth. Because their sample also includes individuals in the labor force and those without health insurance, these estimates could be driven by negative consumption shocks as a result of the onset of disability rather than by positive state-dependent utility. Indeed, the estimate on our interaction term also becomes positive if we add to our sample individuals in the labor force and individuals without health insurance, but we argue that the interaction term in this case no longer estimates state dependence because it is biased by the direct effect of disability on consumption.

Differential reporting of diseases by permanent income

If, conditional on reporting a disease, the severity of the disease varies by permanent income, then this would violate our identifying assumption and bias our inferences. If, for example, conditional on reporting a disease, the severity is greater for the rich than the poor, then we would estimate a larger decline in utility for those with higher permanent income, thus biasing us toward finding negative state dependence; the converse would bias us in the opposite direction.

The existing evidence suggests that reporting differences by socio-economic status (SES) likely bias against our finding of negative state dependence. Banks et al. (2006) compare the education-disease gradient for individuals aged 40 to 70 in the 1999-2002 National Health and Nutrition Examination Survey (NHANES) based on self-reported health measures and on biological measures.[8] For hypertension, the gradients using the two different health measures are virtually indistinguishable; for diabetes, there is some evidence of under-reporting by individuals of lower education (Banks et al., 2006 Table 4). In Appendix Table A11, we present our own analysis of the HRS data, which shows that conditional on reporting that a doctor has told them they have a particular disease, individuals of higher permanent income are less likely to report conditions that indicate a more severe form of the disease. This suggests that the threshold for reporting a disease is higher for the poor. Under the reasonable assumption that this under-reporting by the poor exacerbates the difference in health status among the poor between those who report that they have a diseases and those who do not, this would bias against our finding of negative state-dependent utility.

Is wealth pre-determined in our sample? Some suggestive evidence

In Table 6, we examined how current income and consumption change as health deteriorates using all households in our baseline sample with adequate consumption data (see online Appendix B for details on the consumption data set). Appendix Table A12 replicates Table 6, but instead estimates the model for the subsample of individuals who are always single and for the subsample of non-single households. The results in this table show no evidence of any changes in consumption associated with health shocks. The results also show no evidence that the changes in these variables associated with health shocks are systematically related to permanent income. Appendix Table A13 reports results from alternative specifications which estimate separate coefficients for singles and couples (non-singles) and the results are qualitatively similar. Lastly, Appendix Table A14 reports results from regressions that include dummies for each disease separately (and interacts each disease dummy with household type) rather than use the average number of diseases per person. These results also provide no consistent evidence that health shocks are associated with a significant increase in income or consumption.[9]

Results by gender

Appendix Table A16 reports our estimates of state dependence separately for men and women. The first three columns show the results for the age 50+ sample, and the latter three

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[8] Both the NHANES and HRS self-reported measures are based on the question "has a doctor ever told you that you have X" rather than the respondent's subjective assessment, which may mitigate potential differential reporting.

[9] Of the 27 coefficients estimated in Panel B, only one is statistically significant at conventional levels: the coefficient on both household members having cancer. This result is likely spurious, as it is estimated off of only 14 households and is implausibly large (the point estimate suggests that if both household members get cancer that household consumption increases by roughly 50%).

columns for the age 65+ sample. In neither sample, we find a statistically significant difference in implied state dependence between males and females (p-values are respectively: 0.21 and 0.37), so we are reluctant to read much into the differences in the point estimates. As these estimates illustrate, our statistical power to estimate state dependence is much lower when we cut the sample by demographic characteristics (and especially for uneven splits). For this reason, we have not further explored variation in the size of our estimates by demographic characteristics.

Further results on the estimated magnitude of effect

In Table 3, we presented the implied magnitudes of effect for three samples with different degrees of insurance coverage and for three assumed values of the coefficient of relative risk aversion. Appendix Table A17 presents an expanded version of Table 3. First, we also report the estimate coefficients (the βs) for each specification. We report these in panel A. Second, we add columns 4a-4c, which present results for an additional sample, namely those who receive supplemental insurance from Medicaid. We added this sample because we expected this sample to have minimal out-of-pocket health expenditures, but it turned out that this sample has out-of-pocket health expenditures equal to 1.8 percent of consumption, which is only a fraction lower than the 1.9 percent for the sample presented in columns 3a-c, namely those who had any form of supplemental insurance (Medicaid, VA, or Medicare HMO). Because the sample in columns 4a-4c is much smaller than the samples in the other columns, the estimates for state dependence are relatively imprecise. The point estimates are more negative than in our other samples, but the differences are not statistically significant.

Robustness of the specification checks

Our main set of specification checks changes the baseline specification only along one dimension at a time. We thought this provided a systematic way of probing the robustness of the results while keeping the number of specification checks within reasonable bounds. Of course, varying more than one dimension at the time can also be worthwhile. Tables B1 though B10 provide such further specification checks. Because the number of possible permutations of multiple changes to the baseline is very large, we let the selection of these additional specification checks be guided by requests from referees.

Table B1 shows that the results from Table A3 are robust to replacing permanent income by years of education. The point estimates are similar in magnitude to those in Table A3, but uniformly more statistically significant. Unlike Table A3, all estimates of state dependence in Table B1 are statistically significant at the 5-percent level.

Tables B2 through B5 test the robustness of the sensitivity checks conducted with respect to the measure of health in Tables A7 and A8 along two dimensions: First, our baseline happiness outcome variable is replaced by the CESD-8 measure of subjective well-being (in Tables B2 and B3) or by the CESD-4 measure of subjective well-being (in Tables B4 and B5). Second, the measure of permanent income is replaced by years of education in Table B3 and B5. Finally, each table presents results for both the age 50+ sample and the age 65+ samples. As elsewhere, all samples are limited to those not in the labor force and with health insurance. The results confirm the finding from Tables A7 and A8 that the point estimates for the magnitude of state dependence are lower for the CESD measures than for the happiness dummy, but tend to lie within the confidence interval of our baseline estimates. All point estimates of state dependence in these four tables are negative, but many of them are not statistically significant.

Tables B6 through B9 examine the robustness of Table A10 along two dimensions. First, the results of Table A10 are replicated for our four alternative measures of health (in Tables B6-B9). Second, permanent income is replaced by years of education (in Tables B7 and B9). The results for the 50+ sample are presented in Tables B6 and B7 whereas the results for the 65+ sample are presented in Tables B8 and B9. The results of these four tables largely confirm our findings in Table A10, and show that the positive (though insignificant) point estimate on state dependence in column 3 of Table A10 becomes negative (and occasionally even statistically significant) for other measures of health.

Finally, Table B10 examines the robustness of Table A16 with respect to replacing our baseline measure of permanent income with years of education. Similar to our finding in Table A16, there are no statistically significant differences in the magnitude of state dependence by gender. However, unlike our findings in Table A16, the point estimates for men and women are reasonably close when we use years of education as the measure of permanent income.

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TABLE A1
ADDITIONAL DESCRIPTIVE STATISTICS

Sample restrictions: Age ≥ 50 & Not in labor force (NILF) & Has health insurance

	Obs	Mean	Std. dev.	5th percentile	Median	95th percentile	Std. dev. (within-indiv.)	
Demographics								
NUM_WAVE	45447	4.52	1.50	2	4	7	0	— Number of waves that respondent was interviewed.
$\bar{Y}$ (Permanent income, $)	45447	29224	33297	6236	20667	77285	0	— Permanent income constructed by taking the average across all waves of total household income plus a 5 percent annual draw down of current financial wealth. The average is then adjusted using an OECD-style adjustment (divide by 1.0 if single, and divide by 1.7 if married and living with spouse).
FEMALE	45447	0.63	0.48	0	1	1	0	
NON_WHITE	45447	0.13	0.33	0	0	1	0	
SINGLE	45447	0.40	0.49	0	0	1	0.21	
AGE	45447	72.39	9.00	57	73	87	3.28	
HOUSEHOLD_SIZE	45447	1.99	1.00	1	2	4	0.56	— Household size includes all residents of household (including spouse).
Health Measures								
NUM_DISEASE	45447	1.95	1.30	0	2	4	0.63	— Sum of Yes/No "Has a doctor ever told you have *D*?" (0-7)
SPOUSE_NUM_DISEASE	45447	1.03	1.30	0	0	4	0.71	— Sum of spouse's Yes/No "Has a doctor ever told you have *D*?" (0-7)
ADL_TOTAL	45447	0.44	1.05	0	0	3	0.74	— Sum of Yes/No "Does anyone help you *A*?" (0-6)
IADL_TOTAL	45384	0.41	0.89	0	0	2	0.67	— Sum of Yes/No "Are you able to *I*?" (0-6)
OFL_TOTAL	45446	2.75	2.70	0	2	8	1.69	— Sum of "How difficult is *O*?" (1 = Very or somewhat difficult) (0-10)
HEALTH_INDEX	45334	4.21	4.50	0	3	14	2.67	— Sum of severity of pain (0-3), ADL, IADL, and OFL (0-25)
Utility Proxies								
HAPPY	45447	0.87	0.34	0	1	1	0.28	— Yes/No "Much of the time the past week I felt happy?"
CESD-8	45447	6.32	2.01	2	7	8	1.38	— Sum of Yes/No "Much of the time the past week I felt/was *C*?"
CESD-4	45447	3.38	1.05	1	4	4	0.79	— Subset of 4 out of 8 *CESD-8* questions (enjoy life, happy, sad, lonely).

Notes: Set of diseases: *D* = {hypertension, diabetes, cancer, heart disease, chronic lung disease, stroke, arthritis}. Set of Activities of Daily Living (ADLs): *A* = {dress, bathe or shower, walk across a room, eat (such as cutting up your food), get in and out of bed, use the toilet (including getting up and down)}. Set of Instrumental Activities of Daily Living (IADLs): *I* = {prepare hot meals, shop for groceries, make telephone calls, take medications, use a map, use a calculator}. Set of Other Functional Limitations (OFLs): *O* = {walk several blocks, walk one block, sit up for about 2 hours, get up from a chair, climb several flights of stairs, climb one flight of stairs, stoop/kneel/crouch, pick up a dime, extend your arms above shoulder level, push large objects like a living room chair}. The severity of pain is measured as no pain (0), mild pain (1), moderate pain (2), or severe pain (3). Set of CESD items: *C* = {depressed, everything I did was an effort, my sleep was restless, happy, lonely, enjoyed life, sad, could not 'get going'}. Spouse diseases set to 0 if the respondent is single.

TABLE A2

ADDITIONAL DESCRIPTIVE STATISTICS

Sample restrictions: Age ≥ 65 & Not in labor force (NILF) & Has health insurance

	Obs	Mean	Std. dev.	5th percentile	Median	95th percentile	Std. dev. (within-indiv.)	
Demographics								
NUM_WAVE	37829	5.15	1.46	3	6	7	0	— Number of waves that respondent was interviewed.
$\bar{Y}$ (Permanent income, $)	37829	28313	32279	6422	20070	75326	0	— Permanent income constructed by taking the average across all waves of total household income plus a 5 percent annual draw down of current financial wealth. The average is then adjusted using an OECD-style adjustment (divide by 1.0 if single, and divide by 1.7 if married and living with spouse).
FEMALE	37829	0.62	0.48	0	1	1	0	
NON_WHITE	37829	0.12	0.32	0	0	1	0	
SINGLE	37829	0.44	0.50	0	0	1	0.22	
AGE	37829	75.80	6.81	66	75	88	3.20	
HOUSEHOLD_SIZE	37829	1.91	0.96	1	2	4	0.52	— Household size includes all residents of household (including spouse).
Health Measures								
NUM_DISEASE	37829	1.95	1.28	0	2	4	0.64	— Sum of Yes/No "Has a doctor ever told you have *D*?" (0-7)
SPOUSE_NUM_DISEASE	37829	1.01	1.31	0	0	4	0.72	— Sum of spouse's Yes/No "Has a doctor ever told you have *D*?" (0-7)
ADL_TOTAL	37829	0.42	1.01	0	0	3	0.74	— Sum of Yes/No "Does anyone help you *A*?" (0-6)
IADL_TOTAL	37818	0.40	0.90	0	0	2	0.68	— Sum of Yes/No "Are you able to *I*?" (0-6)
OFL_TOTAL	37827	2.56	2.56	0	2	8	1.74	— Sum of "How difficult is *O*?" (1 = Very or somewhat difficult) (0-10)
HEALTH_INDEX	37774	3.91	4.27	0	2	13	2.75	— Sum of severity of pain (0-3), ADL, IADL, and OFL (0-25)
Utility Proxies								
HAPPY	37829	0.88	0.32	0	1	1	0.28	— Yes/No "Much of the time the past week I felt happy?"
CESD-8	37829	6.39	1.94	2	7	8	1.35	— Sum of Yes/No "Much of the time the past week I felt/was *C*?"
CESD-4	37829	3.40	1.02	1	4	4	0.77	— Subset of 4 out of 8 *CESD-8* questions (enjoy life, happy, sad, lonely).

Notes: Set of diseases: *D* = {hypertension, diabetes, cancer, heart disease, chronic lung disease, stroke, arthritis}. Set of Activities of Daily Living (ADLs): *A* = {dress, bathe or shower, walk across a room, eat (such as cutting up your food), get in and out of bed, use the toilet (including getting up and down)}. Set of Instrumental Activities of Daily Living (IADLs): *I* = {prepare hot meals, shop for groceries, make telephone calls, take medications, use a map, use a calculator}. Set of Other Functional Limitations (OFLs): *O* = {walk several blocks, walk one block, sit up for about 2 hours, get up from a chair, climb several flights of stairs, climb one flight of stairs, stoop/kneel/crouch, pick up a dime, extend your arms above shoulder level, push large objects like a living room chair}. The severity of pain is measured as no pain (0), mild pain (1), moderate pain (2), or severe pain (3). Set of CESD items: *C* = {depressed, everything I did was an effort, my sleep was restless, happy, lonely, enjoyed life, sad, could not 'get going'}. Spouse diseases set to 0 if the respondent is single.

TABLE A3
ALTERNATIVE SPECIFICATIONS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Sample restriction:	Age ≥ 50, NILF, Has Health Insurance					Age ≥ 65, NILF, Has Health Insurance				
	Baseline specification	No covariates	Restrict to always single	Own and spousal health	Habituation	Baseline specification	No covariates	Restrict to always single	Own and spousal health	Habituation
NUM_DISEASE $_{it}$ × $\log(\bar{Y}_i)$ (β_1)	-0.009	-0.008	-0.003	-0.008	-0.011	-0.008	-0.008	-0.003	-0.008	-0.011
	(0.004)	(0.004)	(0.007)	(0.004)	(0.006)	(0.004)	(0.004)	(0.006)	(0.004)	(0.006)
	[0.018]	[0.023]	[0.632]	[0.022]	[0.062]	[0.048]	[0.043]	[0.611]	[0.057]	[0.078]
$\log(\bar{Y}_i)$ (β_3)	0.048	0.052	0.049	0.041	0.048	0.038	0.043	0.037	0.043	0.028
	(0.003)	(0.003)	(0.006)	(0.003)	(0.003)	(0.003)	(0.003)	(0.005)	(0.003)	(0.004)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
NUM_DISEASE $_{it}$ (β_4)	-0.011	-0.012	-0.009	-0.010	-0.010	-0.013	-0.013	-0.005	-0.012	-0.011
	(0.003)	(0.003)	(0.007)	(0.003)	(0.004)	(0.004)	(0.004)	(0.006)	(0.004)	(0.005)
	[0.001]	[0.000]	[0.182]	[0.002]	[0.029]	[0.000]	[0.000]	[0.464]	[0.000]	[0.018]
SPOUSE_NUM_DISEASE $_{it}$ × $\log(\bar{Y}_i)$				0.005					0.010	
				(0.004)					(0.004)	
				[0.156]					[0.011]	
SPOUSE_NUM_DISEASE $_{it}$				-0.011					-0.014	
				(0.003)					(0.004)	
				[0.001]					[0.000]	
NUM_DISEASE $_{i,(t-1)}$ × $\log(\bar{Y}_i)$					-0.001					0.005
					(0.006)					(0.006)
					[0.815]					[0.408]
NUM_DISEASE $_{i,(t-1)}$					-0.002					-0.006
					(0.005)					(0.005)
					[0.629]					[0.246]
N	45447	45447	13437	45447	33910	37829	37829	14361	37829	27700
Number of individuals	11514	11514	3411	11514	9032	10108	10108	3949	10108	7732
Within-person std. dev. of *NUM_DISEASE* $_{it}$ (σ)	0.625	0.625	0.634	0.625	0.555	0.637	0.637	0.638	0.637	0.560
% change in marginal utility for a 1 std. dev. change in NUM_DISEASE $_{it}$ ($\sigma\beta_1/\beta_3$)	-11.2%	-9.9%	-4.2%	-12.7%	-12.3%	-13.4%	-11.8%	-5.6%	-11.1%	-21.6%
	[0.018]	[0.022]	[0.638]	[0.022]	[0.063]	[0.048]	[0.043]	[0.614]	[0.057]	[0.078]

Notes: Column (1) reports the results from the baseline specification in Table 2; see notes to Table 2 (Panel A) for more details. Subsequent columns report results from a single change relative to the baseline specification. Column (2) omits the covariates Age, Age^2, Household size, and Single from equations (15) and (16). Column (3) restricts the sample to individuals who are always single. Column (4) includes the total number of reported diseases of the spouse as well as its interaction with log permanent income. Column (5) includes one-wave lags to test for adaptation/habituation. Columns (6) through (10) report analogous specifications for the alternative sample from column (2) of Table 2. Standard errors are in parentheses and are adjusted to allow for an arbitrary variance-covariance matrix for each individual over time. P-values are in brackets; the p-value for $\sigma\beta_1/\beta_3$ is bootstrapped based on 10,000 iterations, resampling individuals with replacement.

TABLE A4

INDIVIDUAL DISEASE RESULTS

[SINGLE REGRESSION MODEL]

Sample restrictions: Age ≥ 50, NILF, Has Health Insurance								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Blood pressure	Diabetes	Cancer	Lung Disease	Heart Disease	Stroke	Arthritis	Prevalence-weighted linear combination of (1)-(7)
DISEASE $_{it}$ × $\log(\overline{Y}_i)$ (β_1)	-0.020	-0.013	-0.003	-0.045	0.001	-0.019	0.007	-0.008
	(0.010)	(0.017)	(0.013)	(0.019)	(0.011)	(0.018)	(0.008)	(0.004)
	[0.045]	[0.425]	[0.802]	[0.017]	[0.906]	[0.280]	[0.350]	[0.032]
$\log(\overline{Y}_i)$ (β_3)								0.047
								(0.003)
								[0.000]
DISEASE $_{it}$ (β_4)	0.008	0.004	-0.025	-0.042	-0.016	-0.001	-0.017	
	(0.008)	(0.011)	(0.011)	(0.014)	(0.009)	(0.012)	(0.006)	
	[0.293]	[0.694]	[0.020]	[0.003]	[0.072]	[0.904]	[0.009]	
R^2								0.474
N								45447
Number of individuals								11514
% change in marginal utility for a 1 std. dev. change in NUM_DISEASE $_{it}$ $(\sigma\beta_1/\beta_3)$								-10.5%
								[0.029]
F-statistic that all interaction terms are equal								1.64
p-value of F-test, F(6,11513)								0.131

Notes: This table reports results from a single regression, which estimates a modified version of equations (15) and (16) in which seven disease dummies (*DISEASE* $_{it}$) indicating whether the respondent has the particular disease listed in the column heading are separately interacted with log permanent income in a single regression. See notes to Table 2 (Panel A) for more details on the estimating equations. The prevalence-weighted linear combination of the interaction terms (shown in column 8) gives an estimate of state-dependent utility that is comparable to the baseline specification (see Table 2). Standard errors are in parentheses and are adjusted to allow for an arbitrary variance-covariance matrix for each individual over time. P-values are in brackets; the p-value for $\sigma\beta_1/\beta_3$ is bootstrapped based on 10,000 iterations, resampling individuals with replacement.

TABLE A5

SYMPTOMATIC AND ASYMPTOMATIC DISEASES

Sample restrictions: Age ≥ 50, NILF, Has Health Insurance		
	(1)	(2)
*NUM_* ***SYMPTOMATIC*** *_DISEASE* $_{it}$ × log($\overline{Y}_i$) ($\beta_{1,S}$)	-0.006	-0.006
	(0.006)	(0.006)
	[0.301]	[0.317]
*NUM_* ***ASYMPTOMATIC*** *_DISEASE* $_{it}$ × log($\overline{Y}_i$) ($\beta_{1,A}$)	-0.011	-0.010
	(0.006)	(0.006)
	[0.077]	[0.064]
log($\overline{Y}_i$) (β_3)	0.049	0.048
	(0.003)	(0.003)
	[0.000]	[0.000]
*NUM_* ***SYMPTOMATIC*** *_DISEASE* $_{it}$ ($\beta_{4,S}$)	-0.019	-0.017
	(0.005)	(0.005)
	[0.000]	[0.001]
*NUM_* ***ASYMPTOMATIC*** *_DISEASE* $_{it}$ ($\beta_{4,A}$)	-0.001	-0.006
	(0.005)	(0.004)
	[0.773]	[0.194]
R^2	0.474	0.474
N	45447	45447
Number of individuals	11514	11514
Within-person std dev of *NUM_* ***SYMPTOMATIC*** *_DISEASE* $_{it}$ (σ_S)	0.410	0.361
Within-person std dev of *NUM_* ***ASYMPTOMATIC*** *_DISEASE* $_{it}$ (σ_A)	0.368	0.415
p-value on test ($\beta_{1,S} = \beta_{1,A}$)	0.590	0.682
p-value on test ($\beta_{4,S} = \beta_{4,A}$)	0.016	0.116
% change in marginal utility for a 1 std. dev. change in	-5.0%	-4.5%
*NUM_* ***SYMPTOMATIC*** *_DISEASE* $_{it}$ ($\sigma_S\beta_{1,S}/\beta_3$)	[0.303]	[0.318]
% change in marginal utility for a 1 std. dev. change in	-8.3%	-8.7%
*NUM_* ***ASYMPTOMATIC*** *_DISEASE* $_{it}$ ($\sigma_A\beta_{1,A}/\beta_3$)	[0.079]	[0.066]
Symptomatic: {lung disease, stroke, arthritis, **cancer**} Asymptomatic: {high blood pressure, heart disease, diabetes}	X	
Symptomatic: {lung disease, stroke, arthritis} Asymptomatic: {high blood pressure, heart disease, diabetes, **cancer**}		X

Notes: Columns (1) and (2) report the results from augmented versions of equation (15) and (16) to allow for heterogeneous effects depending on whether the disease is symptomatic or asymptomatic. In column (1) cancer is categorized as a symptomatic disease, while in column (2) cancer is categorized as asymptomatic. Standard errors are in parentheses and are adjusted to allow for an arbitrary variance-covariance matrix for each individual over time. P-values are in brackets; the p-value for $\sigma\beta_1/\beta_3$ is bootstrapped based on 10,000 iterations, resampling individuals with replacement.

Table A6
Does the Effect Vary by Number of Diseases?

Sample restrictions: Age $\geq$ 50, NILF, Has Health Insurance	(1)	(2)			(3)			(4)		
	Baseline	coeff.	(s.e.)	[p-value]	coeff.	(s.e.)	[p-value]	coeff.	(s.e.)	[p-value]
$NUM\_DISEASE_{it} \times \log(\bar{Y}_i)$ (β_1)	-0.009									
	(0.004)									
	[0.018]									
$\log(\bar{Y}_i)$ (β_3)	0.048		0.039			0.039			0.039	
	(0.003)		(0.003)			(0.003)			(0.003)	
	[0.000]		[0.000]			[0.000]			[0.000]	
$NUM\_DISEASE_{it}$ (β_4)	-0.011									
	(0.003)									
	[0.001]									
$(NUM\_DISEASE_{it} \geq 1) \times \log(\bar{Y}_i)$		0.005	(0.010)	[0.636]	0.005	(0.010)	[0.636]	0.005	(0.010)	[0.634]
$(NUM\_DISEASE_{it} \geq 2) \times \log(\bar{Y}_i)$		-0.010	(0.008)	[0.230]	-0.010	(0.008)	[0.230]	-0.010	(0.008)	[0.232]
$(NUM\_DISEASE_{it} \geq 3) \times \log(\bar{Y}_i)$		-0.007	(0.009)	[0.456]	-0.007	(0.009)	[0.450]	-0.007	(0.009)	[0.451]
$(NUM\_DISEASE_{it} \geq 4) \times \log(\bar{Y}_i)$		-0.027	(0.014)	[0.046]	-0.027	(0.014)	[0.049]	-0.027	(0.013)	[0.041]
$(NUM\_DISEASE_{it} \geq 5) \times \log(\bar{Y}_i)$		0.008	(0.021)	[0.702]	0.000	(0.021)	[0.986]			
$(NUM\_DISEASE_{it} \geq 6) \times \log(\bar{Y}_i)$		-0.087	(0.057)	[0.123]						
$(NUM\_DISEASE_{it} \geq 1)$		-0.015	(0.008)	[0.056]	-0.015	(0.008)	[0.055]	-0.015	(0.008)	[0.062]
$(NUM\_DISEASE_{it} \geq 2)$		-0.004	(0.006)	[0.528]	-0.004	(0.006)	[0.518]	-0.004	(0.006)	[0.555]
$(NUM\_DISEASE_{it} \geq 3)$		-0.002	(0.007)	[0.804]	-0.002	(0.007)	[0.802]	-0.001	(0.007)	[0.848]
$(NUM\_DISEASE_{it} \geq 4)$		-0.033	(0.010)	[0.001]	-0.033	(0.010)	[0.001]	-0.035	(0.009)	[0.000]
$(NUM\_DISEASE_{it} \geq 5)$		-0.017	(0.016)	[0.298]	-0.017	(0.016)	[0.277]			
$(NUM\_DISEASE_{it} \geq 6)$		-0.006	(0.041)	[0.880]						
R^2	0.474		0.473			0.473			0.473	
N	45447		45447			45447			45447	
Number of individuals	11514		11514			11514			11514	
F-statistic that all interaction terms are equal			1.105			0.916			1.272	
p-value of F-test, F(D-1,11536) D={6,5,4}			0.355			0.453			0.282	
F-statistic that all $(NUM\_DISEASE_{it} \geq d)$ coeffs. equal			1.776			2.239			3.255	
p-value of F-test, F(D-1,11536) D={6,5,4}			0.114			0.062			0.021	

Notes: All columns report results from augmented versions of equation (15) and (16) to allow for heterogeneous effects which depend on the existing number of chronic diseases. Standard errors are in parentheses and are adjusted to allow for an arbitrary variance-covariance matrix for each individual over time. P-values are in brackets; the p-value for $\sigma\beta_1/\beta_3$ is bootstrapped based on 10,000 iterations, resampling individuals with replacement.

TABLE A7
ALTERNATIVE MEASURES OF KEY VARIABLES

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Sample restrictions: Age ≥ 50, NILF, Has Health Insurance									
		Permanent Income replaced by:		*NUM_DISEASE* $_{it}$ replaced by:				*HAPPY* $_{it}$ replaced by:	
	Baseline	Education	Wealth	*ADL TOTAL*	*IADL TOTAL*	*OFL TOTAL*	*HEALTH INDEX*	*CESD-8*	*CESD-4*
NUM_DISEASE $_{it}$ × $\log(\overline{Y}_i)$ (β_1)	-0.009	-0.002	-0.002	-0.005	-0.010	-0.002	-0.002	-0.038	-0.016
	(0.004)	(0.001)	(0.001)	(0.004)	(0.004)	(0.001)	(0.001)	(0.018)	(0.010)
	[0.018]	[0.016]	[0.114]	[0.201]	[0.020]	[0.086]	[0.060]	[0.040]	[0.107]
$\log(\overline{Y}_i)$ (β_3)	0.048	0.010	0.013	0.031	0.034	0.033	0.028	0.613	0.200
	(0.003)	(0.001)	(0.001)	(0.003)	(0.003)	(0.003)	(0.003)	(0.020)	(0.010)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
NUM_DISEASE $_{it}$ (β_4)	-0.011	-0.011	-0.009	-0.022	-0.022	-0.010	-0.009	-0.150	-0.050
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.001)	(0.001)	(0.017)	(0.009)
	[0.001]	[0.001]	[0.139]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
R^2	0.474	0.474	0.453	0.475	0.475	0.475	0.477	0.664	0.595
N	45447	45404	39051	45447	45384	45446	45334	45447	45447
Number of individuals	11514	11501	9794	11514	11504	11513	11498	11514	11514
Within-person std dev of *NUM_DISEASE* $_{it}$ (σ)	0.625	0.626	0.629	0.738	0.669	1.686	2.673	0.625	0.625
% change in marginal utility for a 1 std. dev. change in NUM_DISEASE $_{it}$ ($\sigma\beta_1/\beta_3$)	-11.2%	-13.0%	-10.9%	-12.2%	-19.2%	-12.6%	-17.4%	-3.8%	-5.1%
	[0.018]	[0.011]	[0.114]	[0.204]	[0.021]	[0.081]	[0.065]	[0.045]	[0.119]

Notes: Column (1) reports the results from the baseline specification in Table 2; see notes to Table 2 (Panel A) for more details. Subsequent columns report results from alternative measures of key variables. Column (2) uses years of education (top-coded at 17 years) instead of permanent income. Column (3) uses log net worth excluding net housing wealth and net automobile wealth (see online Appendix B and accompanying text) instead of permanent income. Columns (4) through (7) use other composite health measures described in Tables A1 and A2 instead of total number of diseases. Columns (8) and (9) use other subjective well-being measures from the HRS. Standard errors are in parentheses and are adjusted to allow for an arbitrary variance-covariance matrix for each individual over time. P-values are in brackets; the p-value for $\sigma\beta_1/\beta_3$ is bootstrapped based on 10,000 iterations, resampling individuals with replacement.

TABLE A8
ALTERNATIVE MEASURES OF KEY VARIABLES

Sample restrictions: Age ≥ 65, NILF, Has Health Insurance

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		Permanent Income replaced by:		*NUM_DISEASE* $_{it}$ replaced by:				*HAPPY* $_{it}$ replaced by:	
	Baseline	Education	Wealth	*ADL TOTAL*	*IADL TOTAL*	*OFL TOTAL*	*HEALTH INDEX*	*CESD-8*	*CESD-4*
NUM_DISEASE $_{it}$ × $\log(\overline{Y}_i)$ (β_1)	-0.008	-0.003	-0.002	-0.005	-0.011	-0.003	-0.002	-0.028	-0.018
	(0.004)	(0.001)	(0.001)	(0.004)	(0.004)	(0.002)	(0.001)	(0.020)	(0.011)
	[0.048]	[0.002]	[0.129]	[0.271]	[0.012]	[0.026]	[0.023]	[0.164]	[0.107]
$\log(\overline{Y}_i)$ (β_3)	0.038	0.010	0.010	0.023	0.026	0.028	0.025	0.537	0.185
	(0.003)	(0.001)	(0.001)	(0.003)	(0.003)	(0.003)	(0.003)	(0.021)	(0.011)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
NUM_DISEASE $_{it}$ (β_4)	-0.013	-0.013	-0.012	-0.019	-0.019	-0.009	-0.008	-0.152	-0.052
	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)	(0.001)	(0.001)	(0.018)	(0.010)
	[0.000]	[0.000]	[0.001]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
R^2	0.470	0.469	0.454	0.470	0.470	0.471	0.472	0.659	0.596
N	37829	37789	33434	37829	37818	37827	37774	37829	37829
Number of individuals	10108	10096	8823	10108	10106	10107	10100	10108	10108
Within-person std dev of *NUM_DISEASE* $_{it}$ (σ)	0.637	0.637	0.642	0.736	0.684	1.737	2.750	0.637	0.637
% change in marginal utility for a 1 std. dev. change in NUM_DISEASE $_{it}$ $(\sigma\beta_1/\beta_3)$	-13.4%	-17.3%	-15.0%	-15.1%	-29.3%	-20.8%	-25.9%	-3.3%	-6.1%
	[0.048]	[0.002]	[0.130]	[0.273]	[0.013]	[0.027]	[0.024]	[0.167]	[0.116]

Notes: Column (1) reports the results from the baseline specification in Table 2; see notes to Table 2 (Panel A) for more details. Subsequent columns report results from alternative measures of key variables. Column (2) uses years of education (top-coded at 17 years) instead of permanent income. Column (3) uses log net worth excluding net housing wealth and net automobile wealth (see online Appendix B and accompanying text) instead of permanent income. Columns (4) through (7) use other composite health measures described in Tables A1 and A2 instead of total number of diseases. Columns (8) and (9) use other subjective well-being measures from the HRS. Standard errors are in parentheses and are adjusted to allow for an arbitrary variance-covariance matrix for each individual over time. P-values are in brackets; the p-value for $\sigma\beta_1/\beta_3$ is bootstrapped based on 10,000 iterations, resampling individuals with replacement.

TABLE A9
DIFFERENTIAL CONSUMPTION TRENDS BY PERMANENT INCOME

Sample restrictions: Age $\geq$ 50, NILF, Has Health Insurance

	(1)	(2)	(3)	(4)
Dependent variable:	Total consumption		Non-durable consumption	
Number of Diseases per Person$_{it}$	0.033	0.024	0.035	0.028
	(0.033)	(0.055)	(0.035)	(0.060)
	[0.310]	[0.669]	[0.329]	[0.648]
$Year \times \log(\overline{Y}_i)$	0.021	0.062	0.027	0.069
	(0.016)	(0.025)	(0.018)	(0.028)
	[0.200]	[0.015]	[0.129]	[0.015]
R^2	0.776	0.768	0.780	0.770
N	5014	1898	5014	1898
Sample restrictions:				
All households in baseline sample	X		X	
Limit to always single		X		X

Notes: Table reports results from an OLS regression of the dependent variable in the column heading on the covariates shown in the table, household fixed effects, wave fixed effects, and controls for a quadratic in average household age, household size, and a dummy for whether the household is single. The dependent variables are various household consumption measures. All dependent variables are in logs. The Number of Diseases per Person is the total number of diseases in the household divided by the number of respondents in the household. In columns (2) and (4), the sample is limited to individuals in the baseline sample who are always single. Standard errors, adjusted to allow for an arbitrary variance-covariance matrix for each household over time, are in parentheses and p-values are in brackets.

TABLE A10

ADDITIONAL INTERACTIONS OF PERMANENT INCOME

	(1)	(2)	(3)	(4)	(5)	(6)
Sample restrictions:	Age $\geq$ 50, NILF, Has Health Insurance			Age $\geq$ 65, NILF, Has Health Insurance		
	Baseline Spec.	Permanent Income Interactions		Baseline Spec.	Permanent Income Interactions	
$NUM\_DISEASE_{it} \times \log(\overline{Y}_i)$ (β_1)	-0.009	-0.006	0.004	-0.008	-0.004	-0.002
	(0.004)	(0.004)	(0.005)	(0.004)	(0.004)	(0.005)
	[0.018]	[0.099]	[0.410]	[0.048]	[0.297]	[0.630]
$\log(\overline{Y}_i)$ (β_3)	0.048	0.044	0.023	0.038	0.033	0.029
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
$NUM\_DISEASE_{it}$ (β_4)	-0.011	-0.011	-0.010	-0.013	-0.013	-0.013
	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)
	[0.001]	[0.002]	[0.002]	[0.000]	[0.000]	[0.000]
$HOUSEHOLD\_SIZE_{it} \times \log(\overline{Y}_i)$		0.006	0.005		0.008	0.008
		(0.005)	(0.005)		(0.005)	(0.005)
		[0.182]	[0.235]		[0.104]	[0.104]
$SINGLE_{it} \times \log(\overline{Y}_i)$		-0.037	-0.030		-0.048	-0.046
		(0.014)	(0.014)		(0.015)	(0.015)
		[0.007]	[0.031]		[0.001]	[0.002]
$AGE_{it} \times \log(\overline{Y}_i)$			-0.003			-0.001
			(0.001)			(0.001)
			[0.000]			[0.566]
R^2	0.474	0.474	0.474	0.470	0.470	0.470
N	45447	45447	45447	37829	37829	37829
Number of individuals	11514	11514	11514	10108	10108	10108
Within-person std. dev. of $NUM\_DISEASE_{it}$ (σ)	0.625	0.625	0.625	0.637	0.637	0.637
% change in marginal utility for a 1 std. dev. change in $NUM\_DISEASE_{it}$ ($\sigma\beta_1/\beta_3$)	-11.2%	-8.5%	10.2%	-13.4%	-8.2%	-5.3%
	[0.018]	[0.099]	[0.411]	[0.048]	[0.298]	[0.632]

Notes: Columns (1) and (4) report the results from the baseline specifications in Table 2; see notes to Table 2 (Panel A) for more details. Subsequent columns report alternative specifications which include additional interactions of permanent income with various household demographics. Standard errors are in parentheses and are adjusted to allow for an arbitrary variance-covariance matrix for each individual over time. P-values are in brackets; the p-value for $\sigma\beta_1/\beta_3$ is bootstrapped based on 10,000 iterations, resampling individuals with replacement.

TABLE A11
DISEASE NUMBER AND SEVERITY BY PERMANENT INCOME

Sample restrictions: Age ≥ 50, NILF, Has Health Insurance						
	(1)	(2)	(3)	(4)	(5)	(6)
		Sample: has {lung disease, diabetes, stroke}				
Dependent variable:	Number of diseases	Taking oxygen for lung disease	Severe diabetes, (1-2)	Severe diabetes dummy	Severe stroke, (1-7)	Severe stroke dummy
$\log(\bar{Y}_i)$	-0.231	-0.037	-0.028	-0.025	-0.194	-0.037
	(0.016)	(0.010)	(0.013)	(0.013)	(0.050)	(0.014)
	[0.000]	[0.000]	[0.031]	[0.047]	[0.000]	[0.010]
R^2	0.037	0.017	0.029	0.025	0.019	0.010
N	45447	4864	7927	7927	4387	4387
Mean of dependent variable	1.510	0.009	0.036	0.034	0.076	0.034
Within-individual std. dev. of dep. var.	0.625	0.275	0.281	0.257	1.370	0.433

Notes: Table reports results from a cross-sectional OLS regression of the dependent variable shown in the column heading on wave fixed effects, Age, Age^2, Household size, and a dummy for whether the individual is single. In column (3), severe diabetes is defined as the sum of two dummy variables for whether the respondent takes insulin and whether the respondent has ever been hospitalized for kidney problems; in column (4), severe diabetes is defined if either dummy equals 1. In column (5), severe stroke is defined as the sum of 7 dummy variables for whether the respondent has vision problems, memory problems, speech problems, has seen a doctor recently, has general weakness from stroke, has therapy from stroke, or whether the respondent has other long-lasting problems from stroke; in column (6), severe stroke is defined if any of the 7 dummy variables equals 1. Standard errors, adjusted to allow for an arbitrary variance-covariance matrix for each individual over time, are in parentheses and p-values are in brackets.

TABLE A12
INCOME AND CONSUMPTION RESPONSE TO DISEASE (ALTERNATIVE SAMPLES)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Sample restrictions: Age ≥ 50, NILF, Has Health Insurance											
Additional sample restrictions:	Single Households Only						Non-Single Households Only					
Dependent variable:	Current income		Total consumption		Non-durable consumption		Current income		Total consumption		Non-durable consumption	
Number of Diseases per Person$_{it}$	0.003	-0.001	0.035	0.042	0.041	0.049	0.035	0.034	0.026	0.023	0.021	0.014
	(0.010)	(0.012)	(0.047)	(0.047)	(0.051)	(0.051)	(0.013)	(0.013)	(0.041)	(0.042)	(0.045)	(0.045)
	[0.758]	[0.957]	[0.461]	[0.371]	[0.425]	[0.336]	[0.007]	[0.009]	[0.534]	[0.591]	[0.635]	[0.756]
Number of Diseases per Person$_{it}$ × $\log(\bar{Y}_i)$		-0.015		0.037		0.045		0.017		0.016		0.038
		(0.017)		(0.050)		(0.056)		(0.018)		(0.047)		(0.047)
		[0.370]		[0.461]		[0.427]		[0.333]		[0.743]		[0.414]
Within-Household std. dev. in Number of Diseases per Person$_{it}$	0.615	0.615	0.456	0.456	0.456	0.456	0.504	0.504	0.396	0.396	0.396	0.396
R^2	0.764	0.764	0.775	0.775	0.778	0.778	0.780	0.780	0.777	0.777	0.780	0.781
N	17412	17412	2602	2602	2602	2602	19309	19309	2412	2412	2412	2412

Notes: Table reports results from a regression of the dependent variable on the covariates shown in the table, household fixed effects, wave fixed effects, and controls for a quadratic in average household age and household size. In columns (1) through (6), the sample is restricted to households where the respondent is currently single, while in columns (7) through (12) the sample is restricted to households where the respondents are not single. In all columns, the Number of Diseases per Person is the total number of diseases in the household divided by the number of respondents in the household. In columns (1), (2), (7), (8) the dependent variable is the current household income. All consumption measures include out-of-pocket medical expenditures. The dependent variables in remaining columns are household consumption measures. All dependent variables are in logs. Standard errors, adjusted to allow for an arbitrary variance-covariance matrix for each household over time, are in parentheses and p-values are in brackets.

TABLE A13
INCOME AND CONSUMPTION RESPONSE TO DISEASE (ALTERNATIVE SPECIFICATIONS)

Sample restrictions: Age ≥ 50, NILF, Has Health Insurance	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:	Current income		Total consumption		Non-durable consumption	
$SINGLE_{it}$ × Number of Diseases per $Person_{it}$	0.014	0.010	0.007	0.014	0.008	0.017
	(0.009)	(0.011)	(0.043)	(0.042)	(0.046)	(0.046)
	[0.131]	[0.343]	[0.864]	[0.731]	[0.863]	[0.718]
(1 - $SINGLE_{it}$) × Number of Diseases per $Person_{it}$	0.021	0.020	0.072	0.069	0.075	0.067
	(0.011)	(0.011)	(0.039)	(0.041)	(0.042)	(0.043)
	[0.060]	[0.068]	[0.065]	[0.088]	[0.079]	[0.119]
$SINGLE_{it}$ × Number of Diseases per $Person_{it}$ × $\log(\overline{Y}_i)$		-0.016		0.038		0.045
		(0.017)		(0.050)		(0.056)
		[0.349]		[0.453]		[0.419]
(1 - $SINGLE_{it}$) × Number of Diseases per $Person_{it}$ × $\log(\overline{Y}_i)$		0.013		0.015		0.040
		(0.018)		(0.047)		(0.048)
		[0.473]		[0.747]		[0.406]
R^2	0.784	0.784	0.776	0.776	0.780	0.780
N	36721	36721	5014	5014	5014	5014

Notes: Table reports results from a regression of the dependent variable on the covariates shown in the table, household fixed effects, wave fixed effects, and controls for a quadratic in average household age, household size. In all columns, the Number of Diseases per Person is the total number of diseases in the household divided by the number of respondents in the household. The dependent variable in columns (1) and (2) is the current household income. The dependent variables in remaining columns are household consumption measures. All consumption measures include out-of-pocket medical expenditures. All dependent variables are in logs. Standard errors, adjusted to allow for an arbitrary variance-covariance matrix for each household over time, are in parentheses and p-values are in brackets.

TABLE A14

INCOME AND CONSUMPTION RESPONSES FOR INDIVIDUAL DISEASES

Sample restrictions: Age ≥ 50, NILF, Has Health Insurance

Disease *X* =	Blood pressure	Diabetes	Cancer	Lung Disease	Heart Disease	Stroke	Arthritis
Panel A: Dependent Variable is Current Income							
Any Household Member has Disease *X*	-0.009	0.065	-0.044	0.077	0.002	-0.009	0.009
	(0.023)	(0.027)	(0.034)	(0.042)	(0.026)	(0.033)	(0.017)
	[0.697]	[0.018]	[0.192]	[0.065]	[0.941]	[0.791]	[0.592]
Any Household Member has Disease *X* × (1 - *SINGLE*)	0.047	-0.047	0.033	-0.074	0.014	-0.007	0.005
	(0.032)	(0.036)	(0.040)	(0.049)	(0.032)	(0.042)	(0.023)
	[0.135]	[0.191]	[0.406]	[0.128]	[0.662]	[0.871]	[0.838]
All Household Members have Disease *X* × (1 - *SINGLE*)	-0.023	0.076	-0.062	0.080	-0.054	0.028	-0.016
	(0.022)	(0.054)	(0.046)	(0.073)	(0.029)	(0.065)	(0.017)
	[0.296]	[0.157]	[0.178]	[0.274]	[0.064]	[0.665]	[0.343]
R^2	0.784						
N	36721						
p-value of F-test that all coefficients = 0	0.138						
Panel B: Dependent Variable is Total Consumption							
Any Household Member has Disease *X*	0.025	0.118	-0.179	-0.057	0.017	0.145	-0.018
	(0.077)	(0.143)	(0.173)	(0.123)	(0.102)	(0.186)	(0.116)
	[0.742]	[0.407]	[0.300]	[0.645]	[0.869]	[0.436]	[0.878]
Any Household Member has Disease *X* × (1 - *SINGLE*)	0.030	-0.109	0.260	0.014	0.150	0.049	-0.036
	(0.103)	(0.166)	(0.196)	(0.144)	(0.124)	(0.236)	(0.138)
	[0.773]	[0.514]	[0.186]	[0.921]	[0.225]	[0.837]	[0.791]
All Household Members have Disease *X* × (1 - *SINGLE*)	-0.104	-0.040	0.478	0.074	-0.003	-0.138	0.051
	(0.073)	(0.186)	(0.175)	(0.146)	(0.107)	(0.204)	(0.059)
	[0.153]	[0.829]	[0.006]	[0.612]	[0.981]	[0.499]	[0.394]
R^2	0.777						
N	5014						
p-value of F-test that all coefficients = 0	0.259						
Panel C: Dependent Variable is Non-Durable Consumption							
Any Household Member has Disease *X*	0.048	0.192	-0.210	-0.063	0.013	0.158	-0.081
	(0.082)	(0.147)	(0.199)	(0.134)	(0.108)	(0.195)	(0.130)
	[0.553]	[0.190]	[0.292]	[0.640]	[0.904]	[0.418]	[0.531]
Any Household Member has Disease *X* × (1 - *SINGLE*)	-0.005	-0.185	0.278	-0.010	0.177	0.012	0.030
	(0.110)	(0.175)	(0.224)	(0.152)	(0.129)	(0.246)	(0.154)
	[0.967]	[0.290]	[0.214]	[0.947]	[0.168]	[0.960]	[0.847]
All Household Members have Disease *X* × (1 - *SINGLE*)	-0.123	-0.098	0.521	0.169	0.014	-0.196	0.079
	(0.077)	(0.193)	(0.171)	(0.132)	(0.114)	(0.224)	(0.063)
	[0.108]	[0.610]	[0.002]	[0.199]	[0.901]	[0.381]	[0.211]
R^2	0.781						
N	5014						
p-value of F-test that all coefficients = 0	0.086						

Notes: Each panel reports coefficients from a single OLS regression. This table shows results from estimating a modified version of the regression shown in Table A13 where the Number of Diseases per Person is replaced with seven disease dummies indicating whether any respondent in the household has the particular disease listed in the column heading. The disease dummies are interacted with a dummy for whether or not the household is a couple. The dependent variable in Panel A is the current household income. The dependent variables in the remaining panels are household consumption measures. All consumption measures include out-of-pocket medical expenditures. All dependent variables are in logs. Standard errors, adjusted to allow for an arbitrary variance-covariance matrix for each household over time, are in parentheses and p-values are in brackets.

TABLE A15
CORRELATION BETWEEN ALTERNATIVE PROXY VARIABLES

Panel A: Correlations across alternative measures of subjective well-being

	HAPPY	*CESD-8*	*CESD-4*
HAPPY	1.000	0.867	0.621
CESD-8		1.000	0.743
CESD-4			1.000

Panel B: Correlations across alternative measures of health

	NUM_ DISEASE	*ADL TOTAL*	*IADL TOTAL*	*OFL TOTAL*	*HEALTH INDEX*
NUM_DISEASE	1.000	0.279	0.224	0.465	0.453
ADL TOTAL		1.000	0.525	0.568	0.738
IADL TOTAL			1.000	0.411	0.599
OFL TOTAL				1.000	0.938
HEALTH INDEX					1.000

Notes: Table reports correlations between alternative proxy variables as shown in Table A7. The full description of these variables is given in Tables A1 and A2. The baseline sample (column (1) in Table 2) is used to compute the correlations in this table; i.e., Age $\geq$ 50, NILF, and Has Health Insurance.

TABLE A16

STATE DEPENDENCE BY GENDER

	(1)	(2)	(3)	(4)	(5)	(6)
Sample restrictions:	Age ≥ 50, NILF, Has Health Insurance			Age ≥ 65, NILF, Has Health Insurance		
	Baseline	Women only	Men only	Baseline	Women only	Men only
NUM_DISEASE $_{it}$ × $\log(\overline{Y}_i)$ (β_1)	-0.009	-0.014	0.002	-0.008	-0.015	0.005
	(0.004)	(0.005)	(0.006)	(0.004)	(0.005)	(0.006)
	[0.018]	[0.002]	[0.673]	[0.048]	[0.003]	[0.395]
$\log(\overline{Y}_i)$ (β_3)	0.048	0.062	0.024	0.038	0.060	0.001
	(0.003)	(0.004)	(0.005)	(0.003)	(0.004)	(0.005)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.827]
NUM_DISEASE $_{it}$ (β_4)	-0.011	-0.011	-0.010	-0.013	-0.009	-0.018
	(0.003)	(0.004)	(0.005)	(0.004)	(0.005)	(0.005)
	[0.001]	[0.017]	[0.041]	[0.000]	[0.067]	[0.001]
R^2	0.474	0.469	0.483	0.470	0.469	0.468
N	45447	28782	16665	37829	23632	14197
Number of individuals	11514	7155	4359	10108	6227	3881
Within-person standard deviation of *NUM_DISEASE* $_{it}$ (σ)	0.625	0.614	0.645	0.637	0.628	0.651
p-value of equality of ($\sigma\beta_1/\beta_3$) across (2) and (3) or (5) and (6)		0.206			0.374	
p-value of equality of (β_4) across (2) and (3) or (5) and (6)		0.906			0.199	
% change in marginal utility for a 1 std. dev. change in NUM_DISEASE $_{it}$ ($\sigma\beta_1/\beta_3$)	-11.2%	-14.1%	6.6%	-13.4%	-15.5%	337.7%
	[0.018]	[0.002]	[0.678]	[0.048]	[0.002]	[0.498]

Notes: Columns (1) and (4) report the results from the baseline specifications in Table 2; see notes to Table 2 (Panel A) for more details. Subsequent columns report alternative specifications which include additional interactions of permanent income with various household demographics. Standard errors are in parentheses and are adjusted to allow for an arbitrary variance-covariance matrix for each individual over time. P-values are in brackets; the p-value for $\sigma\beta_1/\beta_3$ is bootstrapped based on 10,000 iterations, resampling individuals with replacement. The within-person standard deviation of *NUM_DISEASE* is computed separately by gender when comparing $\sigma\beta_1/\beta_3$ across genders.

TABLE A17
ESTIMATED MAGNITUDE OF STATE-DEPENDENT UTILITY

Dependent Variable: *HAPPY*	(1a)	(1b)	(1c)	(2a)	(2b)	(2c)	(3a)	(3b)	(3c)	(4a)	(4b)	(4c)
Sample restrictions:	Age ≥ 50, NILF, Has Health Insurance (Baseline)			Age ≥ 65, NILF, Has Health Insurance			Age ≥ 65, NILF, Has Health Insurance + (Medicaid, VA, or Medicare HMO)			Age ≥ 65, NILF, Has Health Insurance + Medicaid		
Coefficient of relative risk aversion:	$\gamma = 1$	$\gamma = 3$	$\gamma = 5$	$\gamma = 1$	$\gamma = 3$	$\gamma = 5$	$\gamma = 1$	$\gamma = 3$	$\gamma = 5$	$\gamma = 1$	$\gamma = 3$	$\gamma = 5$
Panel A: Estimates												
$NUM\_DISEASE_{it} \times \log(\overline{Y}_i)$ (β_1)	-0.009	-0.018	-0.008	-0.008	-0.020	-0.009	-0.014	-0.028	-0.013	-0.058	-0.042	-0.016
	(0.004)	(0.007)	(0.004)	(0.004)	(0.009)	(0.006)	(0.009)	(0.014)	(0.008)	(0.037)	(0.029)	(0.012)
	[0.018]	[0.012]	[0.050]	[0.048]	[0.020]	[0.105]	[0.106]	[0.048]	[0.120]	[0.115]	[0.145]	[0.207]
$\log(\overline{Y}_i)$ (β_3)	0.048	0.098	0.042	0.038	0.091	0.041	0.067	0.115	0.052	0.133	0.100	0.041
	(0.003)	(0.006)	(0.004)	(0.003)	(0.007)	(0.004)	(0.006)	(0.010)	(0.005)	(0.021)	(0.018)	(0.008)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
$NUM\_DISEASE_{it}$ (β_4)	-0.011	-0.010	-0.010	-0.013	-0.012	-0.012	-0.010	-0.010	-0.009	0.002	0.005	0.007
	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)	(0.008)	(0.008)	(0.009)	(0.017)	(0.017)	(0.017)
	[0.001]	[0.002]	[0.002]	[0.000]	[0.000]	[0.001]	[0.247]	[0.256]	[0.300]	[0.898]	[0.763]	[0.662]
R^2	0.474	0.474	0.474	0.470	0.470	0.470	0.595	0.595	0.595	0.597	0.597	0.597
N | Number of Individuals	45447 | 11514			37829 | 10108			10537 | 3056			3353 | 896		
Panel B: Implied State Dependence Assuming Full Insurance (b = 1)												
Within-person standard deviation change in $NUM\_DISEASE_{it}$ (σ)	0.625			0.637			0.559			0.591		
% change in marginal utility for a 1 standard deviation increase in $NUM\_DISEASE_{it}$ $(\sigma\beta_1/\beta_3)$	-11.2%	-11.4%	-11.9%	-13.4%	-14.2%	-14.4%	-12.0%	-13.5%	-13.8%	-25.7%	-24.5%	-22.4%
	[0.018]	[0.012]	[0.050]	[0.048]	[0.020]	[0.105]	[0.106]	[0.048]	[0.120]	[0.115]	[0.145]	[0.207]
Panel C: Implied State Dependence Assuming Partial Insurance (b < 1)												
Out-of-pocket health expenditure share, $m(1\text{-}b)$	0.023			0.025			0.019			0.018		
% change in marginal utility for a 1 std. dev. increase in $NUM\_DISEASE_{it}$ $((\sigma\beta_1/\beta_3)+1)/(1+m(1\text{-}b))^{\gamma} - 1$	-13.2%	-17.1%	-21.2%	-15.5%	-20.2%	-24.1%	-13.6%	-18.1%	-21.3%	-27.0%	-28.3%	-28.8%
	[0.008]	[0.003]	[0.014]	[0.022]	[0.008]	[0.028]	[0.064]	[0.026]	[0.049]	[0.092]	[0.076]	[0.068]

Notes:
This table is an expanded version of Table 3 reported in main text.
Panel A reports coefficients β_1 and β_4 from estimating equation (15) and coefficient β_4 from estimating equation (16); see Table 2 for more details. Standard errors for β_1, β_3, and β_4 are in parentheses and are adjusted to allow for an arbitrary variance-covariance matrix for each individual over time; p-values are in brackets.
Panel B reports the implied magnitude of state dependence under full insurance.
Panel C reports the implied magnitude of state dependence under partial insurance.

TABLE B1

ALTERNATIVE SPECIFICATIONS WITH ALTERNATIVE MEASURES OF KEY VARIABLES

[REPLACING PERMANENT INCOME WITH YEARS OF EDUCATION IN TABLE A3]

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Sample restriction:	Age ≥ 50, NILF, Has Health Insurance					Age ≥ 65, NILF, Has Health Insurance				
	Baseline specification	No covariates	Restrict to always single	Own and spousal health	Habituation	Baseline specification	No covariates	Restrict to always single	Own and spousal health	Habituation
NUM_DISEASE $_{it}$ × *Years of Education* $_i$ (β_1)	-0.002	-0.002	-0.003	-0.002	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
	[0.016]	[0.020]	[0.031]	[0.013]	[0.011]	[0.002]	[0.002]	[0.013]	[0.002]	[0.019]
Years of Education $_i$ (β_3)	0.010	0.010	0.014	0.008	0.010	0.010	0.011	0.013	0.011	0.008
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
NUM_DISEASE $_{it}$ (β_4)	-0.011	-0.012	-0.009	-0.010	-0.010	-0.013	-0.013	-0.004	-0.012	-0.012
	(0.003)	(0.003)	(0.007)	(0.003)	(0.004)	(0.004)	(0.004)	(0.006)	(0.004)	(0.005)
	[0.001]	[0.000]	[0.196]	[0.002]	[0.024]	[0.000]	[0.000]	[0.489]	[0.000]	[0.015]
SPOUSE_NUM_DISEASE $_{it}$				0.001					0.001	
× *Years of Education* $_i$				(0.001)					(0.001)	
				[0.135]					[0.102]	
SPOUSE_NUM_DISEASE $_{it}$				-0.011					-0.013	
				(0.003)					(0.004)	
				[0.001]					[0.000]	
NUM_DISEASE $_{i,(t-1)}$ × *Years of Education* $_i$					0.001					0.001
					(0.001)					(0.001)
					[0.560]					[0.456]
NUM_DISEASE $_{i,(t-1)}$					-0.002					-0.005
					(0.005)					(0.005)
					[0.672]					[0.259]
N	45404	45404	13435	45404	33880	37789	37789	14355	37789	27672
Number of individuals	11501	11501	3410	11501	9024	10096	10096	3946	10096	7725
Within-person std. dev. of *NUM_DISEASE* $_{it}$ (σ)	0.626	0.626	0.634	0.626	0.555	0.637	0.637	0.637	0.637	0.560
% change in marginal utility for a 1 std. dev. change	-13.0%	-11.9%	-14.7%	-15.8%	-18.3%	-17.3%	-16.2%	-16.5%	-16.3%	-22.1%
in NUM_DISEASE $_{it}$ ($\sigma\beta_1/\beta_3$)	[0.011]	[0.020]	[0.031]	[0.013]	[0.011]	[0.002]	[0.002]	[0.013]	[0.002]	[0.019]

Notes: Column (1) reports the results from the baseline specification in Table 2; see notes to Table 2 (Panel A) for more details. Subsequent columns report results from a single change relative to the baseline specification. Column (2) omits the covariates Age, Age^2, Household size, and Single from equations (15) and (16). Column (3) restricts the sample to individuals who are always single. Column (4) includes the total number of reported diseases of the spouse as well as its interaction with log permanent income. Column (5) includes one-wave lags to test for adaptation/habituation. Columns (6) through (10) report analogous specifications for the alternative sample from column (2) of Table 2. Standard errors are in parentheses and are adjusted to allow for an arbitrary variance-covariance matrix for each individual over time. P-values are in brackets; the p-value for $\sigma\beta_1/\beta_3$ is bootstrapped based on 10,000 iterations, resampling individuals with replacement.

TABLE B2

ALTERNATIVE MEASURES OF KEY VARIABLES

[REPLACING DEPENDENT VARIABLE HAPPY WITH CESD-8 IN TABLE A7]

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Sample restriction:	Age ≥ 50, NILF, Has Health Insurance					Age ≥ 65, NILF, Has Health Insurance				
		$NUM\_DISEASE_{it}$ replaced by:					$NUM\_DISEASE_{it}$ replaced by:			
	Baseline	*ADL TOTAL*	*IADL TOTAL*	*OFL TOTAL*	*HEALTH INDEX*	Baseline	*ADL TOTAL*	*IADL TOTAL*	*OFL TOTAL*	*HEALTH INDEX*
$NUM\_DISEASE_{it} \times \log(\overline{Y}_i)$ (β_1)	-0.038	-0.044	-0.035	-0.005	-0.009	-0.028	-0.036	-0.040	-0.010	-0.010
	(0.018)	(0.018)	(0.020)	(0.007)	(0.004)	(0.020)	(0.020)	(0.021)	(0.007)	(0.005)
	[0.040]	[0.016]	[0.081]	[0.449]	[0.056]	[0.164]	[0.071]	[0.058]	[0.153]	[0.031]
$\log(\overline{Y}_i)$ (β_3)	0.613	0.530	0.551	0.485	0.448	0.537	0.467	0.489	0.458	0.424
	(0.020)	(0.019)	(0.020)	(0.019)	(0.018)	(0.021)	(0.021)	(0.021)	(0.020)	(0.019)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
$NUM\_DISEASE_{it}$ (β_4)	-0.150	-0.274	-0.229	-0.143	-0.115	-0.152	-0.261	-0.215	-0.135	-0.107
	(0.017)	(0.015)	(0.016)	(0.006)	(0.004)	(0.018)	(0.016)	(0.016)	(0.006)	(0.004)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
R^2	0.664	0.669	0.667	0.671	0.677	0.659	0.664	0.661	0.666	0.671
N	45447	45447	45384	45446	45334	37829	37829	37818	37827	37774
Number of individuals	11514	11514	11504	11513	11498	10108	10108	10106	10107	10100
Within-person std dev of $NUM\_DISEASE_{it}$ (σ)	0.625	0.738	0.669	1.686	2.673	0.637	0.736	0.684	1.737	2.750
% change in marginal utility for a 1 std. dev. change	-3.8%	-6.2%	-4.2%	-1.8%	-5.1%	-3.3%	-5.6%	-5.6%	-3.9%	-6.7%
in $NUM\_DISEASE_{it}$ $(\sigma\beta_1/\beta_3)$	[0.045]	[0.016]	[0.082]	[0.452]	[0.058]	[0.167]	[0.073]	[0.059]	[0.155]	[0.031]

Notes: Column (1) reports the results from the baseline specification in Table 2; see notes to Table 2 (Panel A) for more details. Subsequent columns report results from alternative measures of key variables. Columns (2) through (5) use other composite health measures described in Table A1 instead of total number of diseases. Columns (6) through (10) report analogous specifications for the alternative baseline sample in column (2) of Table 2. Standard errors are in parentheses and are adjusted to allow for an arbitrary variance-covariance matrix for each individual over time. P-values are in brackets; the p-value for $\sigma\beta_1/\beta_3$ is bootstrapped based on 10,000 iterations, resampling individuals with replacement.

TABLE B3
ALTERNATIVE MEASURES OF KEY VARIABLES
[REPLACING DEPENDENT VARIABLE HAPPY WITH CESD-8 AND PERMANENT INCOME WITH YEARS OF EDUCATION IN TABLE A7]

	(1)	(4)	(5)	(6)	(7)	(1)	(4)	(5)	(6)	(7)
Sample restriction:	Age ≥ 50, NILF, Has Health Insurance					Age ≥ 65, NILF, Has Health Insurance				
		NUM_DISEASE $_{it}$ replaced by:					*NUM_DISEASE* $_{it}$ replaced by:			
	Baseline	*ADL TOTAL*	*IADL TOTAL*	*OFL TOTAL*	*HEALTH INDEX*	Baseline	*ADL TOTAL*	*IADL TOTAL*	*OFL TOTAL*	*HEALTH INDEX*
NUM_DISEASE $_{it}$ × *Years of Education* $_i$ (β_1)	-0.005	-0.006	-0.006	-0.001	-0.002	-0.006	-0.006	-0.008	-0.002	-0.002
	(0.004)	(0.004)	(0.004)	(0.002)	(0.001)	(0.005)	(0.004)	(0.004)	(0.002)	(0.001)
	[0.278]	[0.081]	[0.129]	[0.439]	[0.086]	[0.163]	[0.129]	[0.048]	[0.291]	[0.050]
Years of Education $_i$ (β_3)	0.124	0.113	0.114	0.108	0.102	0.118	0.103	0.105	0.102	0.097
	(0.005)	(0.005)	(0.005)	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)	(0.004)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
NUM_DISEASE $_{it}$ (β_4)	-0.150	-0.265	-0.226	-0.142	-0.114	-0.152	-0.257	-0.213	-0.134	-0.107
	(0.017)	(0.014)	(0.015)	(0.006)	(0.004)	(0.018)	(0.015)	(0.016)	(0.006)	(0.004)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
R^2	0.663	0.669	0.667	0.671	0.677	0.659	0.664	0.661	0.665	0.670
N	45404	45404	45341	45403	45291	37789	37789	37778	37787	37734
Number of individuals	11501	11501	11491	11500	11485	10096	10096	10094	10095	10088
Within-person std dev of *NUM_DISEASE* $_{it}$ (σ)	0.626	0.738	0.669	1.686	2.673	0.637	0.736	0.685	1.738	2.750
% change in marginal utility for a 1 std. dev. change in	-2.4%	-4.1%	-3.5%	-1.9%	-4.4%	-3.5%	-4.1%	-5.1%	-2.9%	-5.6%
NUM_DISEASE $_{it}$ ($\sigma\beta_1/\beta_3$)	[0.282]	[0.082]	[0.131]	[0.444]	[0.089]	[0.166]	[0.131]	[0.049]	[0.292]	[0.050]

Notes: Column (1) reports the results from the baseline specification in Table 2; see notes to Table 2 (Panel A) for more details. Subsequent columns report results from alternative measures of key variables. Columns (2) through (5) use other composite health measures described in Table A1 instead of total number of diseases. Columns (6) through (10) report analogous specifications for the alternative baseline sample in column (2) of Table 2. Standard errors are in parentheses and are adjusted to allow for an arbitrary variance-covariance matrix for each individual over time. P-values are in brackets; the p-value for $\sigma\beta_1/\beta_3$ is bootstrapped based on 10,000 iterations, resampling individuals with replacement.

TABLE B4

ALTERNATIVE MEASURES OF KEY VARIABLES

[REPLACING DEPENDENT VARIABLE HAPPY WITH CESD-4 IN TABLE A7]

	(1)	(4)	(5)	(6)	(7)	(1)	(4)	(5)	(6)	(7)
Sample restriction:	Age $\geq$ 50, NILF, Has Health Insurance					Age $\geq$ 65, NILF, Has Health Insurance				
		NUM_DISEASE $_{it}$ replaced by:					*NUM_DISEASE* $_{it}$ replaced by:			
	Baseline	*ADL TOTAL*	*IADL TOTAL*	*OFL TOTAL*	*HEALTH INDEX*	Baseline	*ADL TOTAL*	*IADL TOTAL*	*OFL TOTAL*	*HEALTH INDEX*
NUM_DISEASE $_{it}$ × $\log(\overline{Y}_i)$ (β_1)	-0.016	-0.016	-0.016	-0.003	-0.003	-0.018	-0.011	-0.018	-0.007	-0.004
	(0.010)	(0.011)	(0.012)	(0.004)	(0.003)	(0.011)	(0.012)	(0.013)	(0.004)	(0.003)
	[0.107]	[0.150]	[0.165]	[0.416]	[0.307]	[0.107]	[0.345]	[0.164]	[0.115]	[0.145]
$\log(\overline{Y}_i)$ (β_3)	0.200	0.163	0.170	0.156	0.135	0.185	0.143	0.152	0.153	0.134
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
NUM_DISEASE $_{it}$ (β_4)	-0.050	-0.102	-0.100	-0.046	-0.040	-0.052	-0.096	-0.087	-0.043	-0.037
	(0.009)	(0.009)	(0.009)	(0.003)	(0.002)	(0.010)	(0.009)	(0.010)	(0.003)	(0.002)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
R^2	0.595	0.598	0.598	0.598	0.601	0.596	0.599	0.598	0.598	0.601
N	45447	45447	45384	45446	45334	37829	37829	37818	37827	37774
Number of individuals	11514	11514	11504	11513	11498	10108	10108	10106	10107	10100
Within-person std dev of *NUM_DISEASE* $_{it}$ (σ)	0.625	0.738	0.669	1.686	2.673	0.637	0.736	0.684	1.737	2.750
% change in marginal utility for a 1 std. dev. change	-5.1%	-7.1%	-6.5%	-3.4%	-5.4%	-6.1%	-5.8%	-8.0%	-7.5%	-8.6%
in NUM_DISEASE $_{it}$ $(\sigma\beta_1/\beta_3)$	[0.119]	[0.151]	[0.166]	[0.419]	[0.309]	[0.116]	[0.349]	[0.167]	[0.117]	[0.147]

Notes: Column (1) reports the results from the baseline specification in Table 2; see notes to Table 2 (Panel A) for more details. Subsequent columns report results from alternative measures of key variables. Columns (2) through (5) use other composite health measures described in Table A1 instead of total number of diseases. Columns (6) through (10) report analogous specifications for the alternative baseline sample in column (2) of Table 2. Standard errors are in parentheses and are adjusted to allow for an arbitrary variance-covariance matrix for each individual over time. P-values are in brackets; the p-value for $\sigma\beta_1/\beta_3$ is bootstrapped based on 10,000 iterations, resampling individuals with replacement.

TABLE B5

ALTERNATIVE MEASURES OF KEY VARIABLES

[REPLACING DEPENDENT VARIABLE HAPPY WITH CESD-4 AND PERMANENT INCOME WITH YEARS OF EDUCATION IN TABLE A7]

	(1)	(4)	(5)	(6)	(7)	(1)	(4)	(5)	(6)	(7)
Sample restriction:	Age ≥ 50, NILF, Has Health Insurance					Age ≥ 65, NILF, Has Health Insurance				
		NUM_DISEASE $_{it}$ replaced by:					*NUM_DISEASE* $_{it}$ replaced by:			
	Baseline	*ADL TOTAL*	*IADL TOTAL*	*OFL TOTAL*	*HEALTH INDEX*	Baseline	*ADL TOTAL*	*IADL TOTAL*	*OFL TOTAL*	*HEALTH INDEX*
NUM_DISEASE $_{it}$ × *Years of Education* $_i$ (β_1)	-0.002	-0.001	-0.003	-0.001	0.000	-0.004	-0.001	-0.003	0.000	0.000
	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.003)	(0.002)	(0.002)	(0.001)	(0.001)
	[0.295]	[0.621]	[0.250]	[0.556]	[0.543]	[0.084]	[0.719]	[0.130]	[0.646]	[0.455]
Years of Education $_i$ (β_3)	0.044	0.038	0.039	0.038	0.034	0.045	0.034	0.036	0.035	0.032
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)	(0.003)	(0.002)	(0.002)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
NUM_DISEASE $_{it}$ (β_4)	-0.050	-0.098	-0.098	-0.045	-0.040	-0.052	-0.094	-0.086	-0.042	-0.036
	(0.009)	(0.008)	(0.009)	(0.003)	(0.002)	(0.010)	(0.009)	(0.009)	(0.003)	(0.002)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
R^2	0.595	0.598	0.597	0.598	0.601	0.596	0.598	0.597	0.598	0.601
N	45404	45404	45341	45403	45291	37789	37789	37778	37787	37734
Number of individuals	11501	11501	11491	11500	11485	10096	10096	10094	10095	10088
Within-person std dev of *NUM_DISEASE* $_{it}$ (σ)	0.626	0.738	0.669	1.686	2.673	0.637	0.736	0.685	1.738	2.750
% change in marginal utility for a 1 std. dev. change in	-3.5%	-2.0%	-4.6%	-2.4%	-2.8%	-6.2%	-1.7%	-6.6%	-2.1%	-3.7%
NUM_DISEASE $_{it}$ ($\sigma\beta_1/\beta_3$)	[0.297]	[0.623]	[0.256]	[0.558]	[0.545]	[0.087]	[0.720]	[0.131]	[0.647]	[0.459]

Notes: Column (1) reports the results from the baseline specification in Table 2; see notes to Table 2 (Panel A) for more details. Subsequent columns report results from alternative measures of key variables. Columns (2) through (5) use other composite health measures described in Table A1 instead of total number of diseases. Columns (6) through (10) report analogous specifications for the alternative baseline sample in column (2) of Table 2. Standard errors are in parentheses and are adjusted to allow for an arbitrary variance-covariance matrix for each individual over time. P-values are in brackets; the p-value for $\sigma\beta_1/\beta_3$ is bootstrapped based on 10,000 iterations, resampling individuals with replacement.

TABLE B6

ADDITIONAL INTERACTIONS OF PERMANENT INCOME WITH ALTERANTIVE MEASURES OF KEY VARIABLES

[REPLACING NUMBER OF DISEASES WITH ALTERNATIVE MEASURES IN TABLE A10]

Sample restrictions: Age > 50, NILF, Has Health Insurance

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
		Permanent Income Interactions		*$NUM\_DISEASE_{it}$* replaced by:											
	Baseline			*ADL TOTAL*			*IADL TOTAL*			*OFL TOTAL*			*HEALTH INDEX*		
$NUM\_DISEASE_{it}$ × $\log(\overline{Y}_i)$ (β_1)	-0.009	-0.006	0.004	-0.005	-0.005	-0.002	-0.010	-0.009	-0.007	-0.002	-0.002	0.000	-0.002	-0.001	0.000
	(0.004)	(0.004)	(0.005)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
	[0.018]	[0.099]	[0.410]	[0.201]	[0.257]	[0.585]	[0.020]	[0.031]	[0.119]	[0.086]	[0.200]	[0.871]	[0.060]	[0.128]	[0.677]
$\log(\overline{Y}_i)$ (β_3)	0.048	0.044	0.023	0.031	0.032	0.029	0.034	0.035	0.032	0.033	0.033	0.026	0.028	0.028	0.022
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
$NUM\_DISEASE_{it}$ (β_4)	-0.011	-0.011	-0.010	-0.022	-0.022	-0.021	-0.022	-0.022	-0.022	-0.010	-0.010	-0.010	-0.009	-0.009	-0.009
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
	[0.001]	[0.002]	[0.002]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
$HOUSEHOLD\_SIZE_{it}$ × $\log(\overline{Y}_i)$		0.006	0.005		0.006	0.006		0.007	0.006		0.007	0.006		0.007	0.006
		(0.005)	(0.005)		(0.005)	(0.005)		(0.005)	(0.005)		(0.005)	(0.005)		(0.005)	(0.005)
		[0.182]	[0.235]		[0.159]	[0.220]		[0.149]	[0.211]		[0.148]	[0.202]		[0.138]	[0.196]
$SINGLE_{it}$ × $\log(\overline{Y}_i)$		-0.037	-0.030		-0.041	-0.030		-0.040	-0.029		-0.039	-0.030		-0.041	-0.031
		(0.014)	(0.014)		(0.014)	(0.014)		(0.014)	(0.014)		(0.014)	(0.014)		(0.014)	(0.014)
		[0.007]	[0.031]		[0.003]	[0.033]		[0.004]	[0.036]		[0.004]	[0.030]		[0.003]	[0.024]
AGE_{it} × $\log(\overline{Y}_i)$			-0.003			-0.003			-0.003			-0.003			-0.003
			(0.001)			(0.001)			(0.001)			(0.001)			(0.001)
			[0.000]			[0.000]			[0.000]			[0.000]			[0.000]
R^2	0.474	0.474	0.474	0.475	0.475	0.476	0.475	0.476	0.476	0.475	0.476	0.476	0.477	0.478	0.478
N	45447	45447	45447	45447	45447	45447	45384	45384	45384	45446	45446	45446	45334	45334	45334
Number of individuals	11514	11514	11514	11514	11514	11514	11504	11504	11504	11513	11513	11513	11498	11498	11498
Within-person std. dev. of *$NUM\_DISEASE_{it}$* (σ)	0.625	0.625	0.625	0.738	0.738	0.738	0.669	0.669	0.669	1.686	1.686	1.686	2.673	2.673	2.673
% change in marginal utility for a 1 std. dev.	-11.2%	-8.5%	10.2%	-12.2%	-10.5%	-5.7%	-19.2%	-17.3%	-13.9%	-12.6%	-9.5%	-1.6%	-17.4%	-14.1%	-5.2%
change in $NUM\_DISEASE_{it}$ ($\sigma\beta_1/\beta_3$)	[0.018]	[0.099]	[0.411]	[0.204]	[0.258]	[0.588]	[0.021]	[0.031]	[0.122]	[0.081]	[0.201]	[0.872]	[0.065]	[0.127]	[0.679]

Notes: Column (1) reports the results from the baseline specification in Table 2; see notes to Table 2 (Panel A) for more details. Subsequent columns report alternative specifications which include additional interactions of permanent income with various household demographics. Standard errors are in parentheses and are adjusted to allow for an arbitrary variance-covariance matrix for each individual over time. P-values are in brackets; the p-value for $\sigma\beta_1/\beta_3$ is bootstrapped based on 10,000 iterations, resampling individuals with replacement.

TABLE B7
ADDITIONAL INTERACTIONS OF PERMANENT INCOME WITH ALTERANTIVE MEASURES OF KEY VARIABLES
[REPLACING PERMANENT INCOME WITH YEARS OF EDUCATION IN TABLE B6]

	Sample restrictions: Age > 50, NILF, Has Health Insurance														
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
		Permanent Income		*NUM_DISEASE$_{it}$* replaced by:											
	Baseline	Interactions		*ADL TOTAL*			*IADL TOTAL*			*OFL TOTAL*			*HEALTH INDEX*		
NUM_DISEASE$_{it}$ × Years of Education$_i$ (β_1)	-0.002	-0.002	0.000	-0.001	-0.001	-0.001	-0.002	-0.002	-0.002	-0.001	-0.001	-0.001	-0.001	-0.001	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
	[0.016]	[0.049]	[0.841]	[0.053]	[0.066]	[0.205]	[0.005]	[0.007]	[0.033]	[0.007]	[0.015]	[0.146]	[0.002]	[0.005]	[0.062]
Years of Education$_i$ (β_3)	0.010	0.009	0.006	0.006	0.006	0.007	0.006	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
NUM_DISEASE$_{it}$ (β_4)	-0.011	-0.011	-0.010	-0.022	-0.022	-0.021	-0.022	-0.022	-0.022	-0.011	-0.010	-0.010	-0.009	-0.009	-0.009
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
	[0.001]	[0.001]	[0.002]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
HOUSEHOLD_SIZE$_{it}$ × Years of Education$_i$		0.001	0.001		0.001	0.001		0.001	0.001		0.001	0.001		0.001	0.001
		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)
		[0.352]	[0.378]		[0.368]	[0.397]		[0.323]	[0.361]		[0.315]	[0.332]		[0.337]	[0.367]
SINGLE$_{it}$ × Years of Education$_i$		-0.006	-0.005		-0.007	-0.005		-0.007	-0.005		-0.007	-0.005		-0.007	-0.005
		(0.003)	(0.003)		(0.003)	(0.003)		(0.003)	(0.003)		(0.003)	(0.003)		(0.003)	(0.003)
		[0.046]	[0.126]		[0.026]	[0.126]		[0.034]	[0.137]		[0.040]	[0.132]		[0.034]	[0.109]
AGE$_{it}$ × Years of Education$_i$			-0.001			-0.001			-0.001			0.000			0.000
			(0.000)			(0.000)			(0.000)			(0.000)			(0.000)
			[0.005]			[0.001]			[0.002]			[0.007]			[0.011]
R^2	0.474	0.474	0.474	0.475	0.475	0.475	0.475	0.475	0.476	0.475	0.475	0.476	0.477	0.477	0.478
N	45404	45404	45404	45404	45404	45404	45341	45341	45341	45403	45403	45403	45291	45291	45291
Number of individuals	11501	11501	11501	11501	11501	11501	11491	11491	11491	11500	11500	11500	11485	11485	11485
Within-person std. dev. of *NUM_DISEASE$_{it}$* (σ)	0.626	0.626	0.626	0.738	0.738	0.738	0.669	0.669	0.669	1.686	1.686	1.686	2.673	2.673	2.673
% change in marginal utility for a 1 std. dev.	-13.0%	-11.3%	2.3%	-17.2%	-15.9%	-10.8%	-22.9%	-21.5%	-16.7%	-19.6%	-18.0%	-12.1%	-23.6%	-22.0%	-16.3%
change in NUM_DISEASE$_{it}$ ($\sigma\beta_1/\beta_3$)	[0.011]	[0.049]	[0.844]	[0.054]	[0.068]	[0.208]	[0.005]	[0.007]	[0.033]	[0.007]	[0.015]	[0.148]	[0.002]	[0.005]	[0.063]

Notes: Column (1) reports the results from the baseline specification in Table 2; see notes to Table 2 (Panel A) for more details. Subsequent columns report alternative specifications which include additional interactions of permanent income with various household demographics. Standard errors are in parentheses and are adjusted to allow for an arbitrary variance-covariance matrix for each individual over time. P-values are in brackets; the p-value for $\sigma\beta_1/\beta_3$ is bootstrapped based on 10,000 iterations, resampling individuals with replacement.

TABLE B8
ADDITIONAL INTERACTIONS OF PERMANENT INCOME WITH ALTERANTIVE MEASURES OF KEY VARIABLES
[REPLACING NUMBER OF DISEASES WITH ALTERNATIVE MEASURES IN TABLE A10]

Sample restrictions: Age ≥ 65, NILF, Has Health Insurance

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
		Permanent Income Interactions		*NUM_DISEASE* $_{it}$ replaced by:											
	Baseline			*ADL TOTAL*			*IADL TOTAL*			*OFL TOTAL*			*HEALTH INDEX*		
NUM_DISEASE $_{it}$ × $\log(\overline{Y}_i)$ (β_1)	-0.008	-0.004	-0.002	-0.005	-0.004	-0.003	-0.011	-0.010	-0.010	-0.003	-0.002	-0.002	-0.002	-0.002	-0.002
	(0.004)	(0.004)	(0.005)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)
	[0.048]	[0.297]	[0.630]	[0.271]	[0.361]	[0.486]	[0.012]	[0.021]	[0.032]	[0.026]	[0.100]	[0.197]	[0.023]	[0.070]	[0.140]
$\log(\overline{Y}_i)$ (β_3)	0.038	0.033	0.029	0.023	0.024	0.024	0.026	0.028	0.028	0.028	0.028	0.027	0.025	0.025	0.024
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
NUM_DISEASE $_{it}$ (β_4)	-0.013	-0.013	-0.013	-0.019	-0.019	-0.019	-0.019	-0.019	-0.019	-0.009	-0.009	-0.009	-0.008	-0.008	-0.008
	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
HOUSEHOLD_SIZE $_{it}$ × $\log(\overline{Y}_i)$		0.008	0.008		0.009	0.009		0.009	0.009		0.009	0.009		0.008	0.008
		(0.005)	(0.005)		(0.005)	(0.005)		(0.005)	(0.005)		(0.005)	(0.005)		(0.005)	(0.005)
		[0.104]	[0.104]		[0.100]	[0.100]		[0.097]	[0.098]		[0.094]	[0.094]		[0.107]	[0.108]
SINGLE $_{it}$ × $\log(\overline{Y}_i)$		-0.048	-0.046		-0.051	-0.046		-0.049	-0.046		-0.048	-0.046		-0.049	-0.047
		(0.015)	(0.015)		(0.015)	(0.015)		(0.015)	(0.015)		(0.015)	(0.015)		(0.015)	(0.015)
		[0.001]	[0.002]		[0.000]	[0.002]		[0.001]	[0.002]		[0.001]	[0.002]		[0.001]	[0.001]
AGE $_{it}$ × $\log(\overline{Y}_i)$			-0.001			-0.001			-0.001			-0.001			-0.001
			(0.001)			(0.001)			(0.001)			(0.001)			(0.001)
			[0.566]			[0.215]			[0.429]			[0.489]			[0.519]
R^2	0.470	0.470	0.470	0.470	0.471	0.471	0.470	0.471	0.471	0.471	0.471	0.471	0.472	0.472	0.472
N	37829	37829	37829	37829	37829	37829	37818	37818	37818	37827	37827	37827	37774	37774	37774
Number of individuals	10108	10108	10108	10108	10108	10108	10106	10106	10106	10107	10107	10107	10100	10100	10100
Within-person std. dev. of *NUM_DISEASE* $_{it}$ (σ)	0.637	0.637	0.637	0.736	0.736	0.736	0.684	0.684	0.684	1.737	1.737	1.737	2.750	2.750	2.750
% change in marginal utility for a 1 std. dev. change in NUM_DISEASE $_{it}$ ($\sigma\beta_1/\beta_3$)	-13.4%	-8.2%	-5.3%	-15.1%	-11.6%	-9.2%	-29.3%	-25.3%	-24.0%	-20.8%	-15.5%	-13.5%	-25.9%	-20.4%	-18.5%
	[0.048]	[0.298]	[0.632]	[0.273]	[0.364]	[0.489]	[0.013]	[0.021]	[0.033]	[0.027]	[0.102]	[0.199]	[0.024]	[0.071]	[0.141]

Notes: Column (1) reports the results from the baseline specification in Table 2; see notes to Table 2 (Panel A) for more details. Subsequent columns report alternative specifications which include additional interactions of permanent income with various household demographics. Standard errors are in parentheses and are adjusted to allow for an arbitrary variance-covariance matrix for each individual over time. P-values are in brackets; the p-value for $\sigma\beta_1/\beta_3$ is bootstrapped based on 10,000 iterations, resampling individuals with replacement.

TABLE B9
ADDITIONAL INTERACTIONS OF PERMANENT INCOME WITH ALTERANTIVE MEASURES OF KEY VARIABLES
[REPLACING PERMANENT INCOME WITH YEARS OF EDUCATION IN TABLE B8]

	Sample restrictions: Age ≥ 65, NILF, Has Health Insurance														
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	Baseline	Permanent Income Interactions		*NUM_DISEASE* $_{it}$ replaced by:											
				ADL TOTAL			*IADL TOTAL*			*OFL TOTAL*			*HEALTH INDEX*		
NUM_DISEASE $_{it}$ × *Years of Education* $_i$ (β_1)	-0.003	-0.002	-0.002	-0.001	-0.001	-0.001	-0.002	-0.002	-0.002	-0.001	-0.001	-0.001	-0.001	-0.001	-0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
	[0.002]	[0.013]	[0.164]	[0.079]	[0.115]	[0.239]	[0.013]	[0.023]	[0.060]	[0.005]	[0.013]	[0.076]	[0.002]	[0.006]	[0.035]
Years of Education $_i$ (β_3)	0.010	0.009	0.008	0.005	0.005	0.005	0.005	0.005	0.005	0.007	0.006	0.006	0.006	0.006	0.006
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
NUM_DISEASE $_{it}$ (β_4)	-0.013	-0.013	-0.013	-0.019	-0.019	-0.019	-0.018	-0.018	-0.018	-0.009	-0.009	-0.009	-0.008	-0.008	-0.008
	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
HOUSEHOLD_SIZE $_{it}$ × *Years of Education* $_i$		0.001	0.001		0.001	0.001		0.001	0.001		0.001	0.001		0.001	0.001
		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)
		[0.340]	[0.341]		[0.352]	[0.356]		[0.319]	[0.332]		[0.327]	[0.325]		[0.387]	[0.395]
SINGLE $_{it}$ × *Years of Education* $_i$		-0.008	-0.008		-0.009	-0.008		-0.009	-0.008		-0.008	-0.007		-0.009	-0.008
		(0.003)	(0.003)		(0.003)	(0.003)		(0.003)	(0.003)		(0.003)	(0.003)		(0.003)	(0.003)
		[0.015]	[0.025]		[0.007]	[0.026]		[0.008]	[0.026]		[0.011]	[0.027]		[0.010]	[0.022]
AGE $_{it}$ × *Years of Education* $_i$			0.000			0.000			0.000			0.000			0.000
			(0.000)			(0.000)			(0.000)			(0.000)			(0.000)
			[0.378]			[0.044]			[0.071]			[0.155]			[0.231]
R^2	0.469	0.470	0.470	0.470	0.470	0.471	0.470	0.470	0.470	0.470	0.471	0.471	0.472	0.472	0.472
N	37789	37789	37789	37789	37789	37789	37778	37778	37778	37787	37787	37787	37734	37734	37734
Number of individuals	10096	10096	10096	10096	10096	10096	10094	10094	10094	10095	10095	10095	10088	10088	10088
Within-person std. dev. of *NUM_DISEASE* $_{it}$ (σ)	0.637	0.637	0.637	0.736	0.736	0.736	0.685	0.685	0.685	1.738	1.738	1.738	2.750	2.750	2.750
% change in marginal utility for a 1 std. dev. change in NUM_DISEASE $_{it}$ ($\sigma\beta_1/\beta_3$)	-17.3%	-15.4%	-12.6%	-19.3%	-17.1%	-13.1%	-25.4%	-23.1%	-19.5%	-24.2%	-21.9%	-18.0%	-27.5%	-25.3%	-22.2%
	[0.002]	[0.013]	[0.165]	[0.081]	[0.116]	[0.241]	[0.013]	[0.023]	[0.061]	[0.005]	[0.013]	[0.076]	[0.002]	[0.006]	[0.035]

Notes: Column (1) reports the results from the baseline specification in Table 2; see notes to Table 2 (Panel A) for more details. Subsequent columns report alternative specifications which include additional interactions of permanent income with various household demographics. Standard errors are in parentheses and are adjusted to allow for an arbitrary variance-covariance matrix for each individual over time. P-values are in brackets; the p-value for $\sigma\beta_1/\beta_3$ is bootstrapped based on 10,000 iterations, resampling individuals with replacement.

TABLE B10
STATE DEPENDENCE BY GENDER
[REPLACING PERMANENT INCOME WITH YEARS OF EDUCATION IN TABLE A16]

	(1)	(2)	(3)	(4)	(5)	(6)
	Age ≥ 50, NILF, Has Health Insurance			Age ≥ 65, NILF, Has Health Insurance		
	Baseline	Women only	Men only	Baseline	Women only	Men only
NUM_DISEASE $_{it}$ × *Years of Education* $_i$ (β_1)	-0.002	-0.003	-0.000	-0.003	-0.004	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
	[0.016]	[0.004]	[0.709]	[0.002]	[0.000]	[0.499]
Years of Education $_i$ (β_3)	0.010	0.015	0.004	0.010	0.016	0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.827]
NUM_DISEASE $_{it}$ (β_4)	-0.011	-0.010	-0.010	-0.013	-0.008	-0.018
	(0.003)	(0.004)	(0.005)	(0.004)	(0.005)	(0.005)
	[0.001]	[0.018]	[0.041]	[0.000]	[0.075]	[0.001]
R^2	0.474	0.469	0.482	0.469	0.470	0.467
N	45404	28755	16649	37789	23607	14182
Number of individuals	11501	7146	4355	10096	6219	3877
Within-person standard deviation of *NUM_DISEASE* $_{it}$ (σ)	0.626	0.614	0.645	0.637	0.629	0.651
p-value of equality of ($\sigma\beta_1/\beta_3$) across (2) and (3) or (5) and (6)		0.780			0.374	
p-value of equality of (β_4) across (2) and (3) or (5) and (6)		0.955			0.199	
% change in marginal utility for a 1 std. dev. change in NUM_DISEASE $_{it}$ ($\sigma\beta_1/\beta_3$)	-13.0%	-14.1%	-8.0%	-17.3%	-17.0%	-25.3%
	[0.011]	[0.004]	[0.728]	[0.002]	[0.001]	[0.503]

Notes: Columns (1) and (4) report the results from the baseline specifications in Table 2; see notes to Table 2 (Panel A) for more details. Subsequent columns report alternative specifications which include additional interactions of permanent income with various household demographics. Standard errors are in parentheses and are adjusted to allow for an arbitrary variance-covariance matrix for each individual over time. P-values are in brackets; the p-value for $\sigma\beta_1/\beta_3$ is bootstrapped based on 10,000 iterations, resampling individuals with replacement. The within-person standard deviation of *NUM_DISEASE* is computed separately by gender when comparing $\sigma\beta_1/\beta_3$ across genders.