Appendix to "Long Term Care Risk For Couples and Singles"

A Data and Sample Selection

The main data set used in our analysis is the Health and Retirement Study (HRS). We use three user-friendly versions of the HRS produced by the RAND Center for the Study of Aging: (1) the RAND HRS Longitudinal File 2016 (V1) which contains 13 waves of data from 1992 to 2016, (2) the Harmonized HRS data which contains 12 waves from 1992-2014, and (3) the RAND HRS Family data files (V1) which also contains 12 waves from 1992 to 2014. The first longitudinal file contains variables that include demographics, health, income, assets, medical expenditures and insurance. The second harmonized file contains detailed information on ADLs, IADLs, and formal and informal care and costs of care. The third family file contains information on transfers to and from children.

Our analysis is conducted using data from waves 5 to 12, covering years 2000 to 2014. We use all seven cohorts of the HRS: Initial HRS, AHEAD, Children of Depression (CODA), War Baby, Early Baby Boomer, Mid Baby Boomer and Late Baby Boomer cohorts. All statistics are calculated using the combined respondent weight and nursing resident weight variable (r*wtcrnh). We exclude all households who own private long term care insurance.

B Education

The two education groups are: (1) non-college (less than 16 years of education) and (2) college (16 or more years of education). For married households, we assume that household's education is given by that of the husband. We also assume that if the husband dies, the widow continues as a single individual, keeping the same education level. We find that non-college women married to college educated husbands have health transitions and medical expenditures that are more similar to college single women than non-college single women. Therefore, our assumptions regarding household education are reasonable.

In all the data work, when constructing any statistics by education for married/widowed women, we change their education status to that of the husband. In the HRS, the education of the late husband is available if he was alive at the time of the first interview. If a female respondent is widowed before the first interview, this information is missing, and we keep her own education status. In MEPS, the education of the late husbands is usually not available as MEPS is a short panel, so we use the widows' own education levels. Since we use MEPS only for statistics on non-retirees, there are very few widows.

C Health Variable Construction

In the HRS, we construct health using information on self reported health, 6 ADLs, 5IADLs, and informal and professional care received. The self-reported health measure is the standard variable where respondents rate their health as excellent, very good, good, fair or poor. The 6 ADL variables used ask whether the respondent gets help with: (1) walking across a room, (2) dressing, (3) bathing, (4) eating, (5) getting in and out of bed, and (6) using the toilet. In each case, the respondent answers "yes" or "no."

The HRS also has information on total hours of care received from a spouse/children/others. Following Barczyk and Kredler (2018), we classify individuals as highly disabled if they receive at least 90 hours of care per month. We also categorize them as highly disabled when they answer yes to having professional care (PC) or when they report living in a nursing homes (NH) at the time of interview.

The following table summarizes how the health variable is constructed using this information.

Health	Self Reported Health	Hours of IC/ Has PC/ NH	No. of ADLs
Good	Good/V. Good/Excellent	any IC, no PC/NH	0
Bad	Fair or Poor	any IC, no PC/NH	0
Low Disability	any	< 90 hrs/month, no PC/NH	1+ ADL or IADL
High Disability	any	90+ hrs/month OR PC/NH	1+ ADL or IADL

We assume that there is no disability at ages younger than 65. In the MEPS, where we use data only on individuals younger than 65, we construct the health variable based on self reported health only, coding it as Good or Bad.

D Age Structure

The model period is 2 years. All ages in the model are odd numbers starting with 35.

D.1 Married Couples: Age Differences Between Spouses

While on average wives are a few years younger than their husbands, there is a large variance in age differences between spouses across households. Table L.2 shows the distribution of wive's ages in the HRS for married men at the age of 65. We are interested in capturing this heterogeneity while keeping the model simple and tractable. We discretize the possible age differences into three groups based on the following analysis.

Table L.2 reveals that the distribution of age differences between spouses is very similar across education groups. Based on the distribution in this table, we construct three groups as follows: the first group contains wives who are 8 or more years younger than the husbands; the second groups contains wives who are between 1 and 7 years younger; and the third group contains wives who are the same age or older than their husbands. The first and the third groups each contains approximately 20% of couples, while the second group contains approximately 60% of couples. The mean and median age difference in each one of these groups is given in

Table L.3. We assign these median values as the age difference corresponding to each group in the model. (Minor adjustments are made to accommodate the fact that all ages are odd numbers in the model.) Specifically, the wives in the model have the following ages relative to the husband: (1) 10 years younger; (2) 4 years younger; and (3) 2 years older.

E Initial Distributions

E.1 Demographic Structure at Age 35

Since our paper is focused on ages 65 and above, it is important to have the right demographic structure at these ages. Note that because we abstract from marriage and divorce, we cannot simply start the model with the demographic structure observed in the data at the age of 35. If we did this, the model would not deliver the correct demographic distribution at the age of 65 and older.

Our strategy is to calibrate an initial demographic structure at the age of 35 such that, given our estimated survival probabilities, we obtain a demographic structure at the age of 65 that matches the data. Because we abstract from marriage and divorce, the demographic structure in the model at young ages will not match the data perfectly.

The initial demographic structure at the age of 35 is given by $\Lambda^{35}(d)$. The state d summarizes the type of household, depending on education, on whether it is a single or married household, on sex in the case of singles, and on the age difference between husband and wife in the case of married households. There are 10 possible values of d corresponding to different types of households:

d	Marital status	Education	Sex	Wife Age-Husband Age
1	single	college	f	-
2	single	non-college	f	-
3	single	college	m	-
4	single	non-college	m	-
5	married	college	-	-10
6	married	college	-	-4
7	married	college	-	+2
8	married	non-college	-	-10
9	married	non-college	-	-4
10	married	non-college	-	+2

The specific strategy for calibrating $\Lambda^{35}(d)$ is the following:

1. We guess a demographic structure at the age of 35 given by $\Lambda^{35}_{guess}(d)$.

2. We simulate a large number of households that evolve according to our estimated health transitions and survival probabilities.

3. We compare the distribution of d at the age of 65 in the simulated data with that observed in the data (HRS).

4. We iterate on $\Lambda^{35}_{guess}(d)$ until the distribution at the age of 65 is as in the data: $\Lambda^{65}_{model}(d) = \Lambda^{65}_{HRS}(d)$.

Table L.4 presents the distribution of households at ages 64-66 observed in the CPS and the resulting distribution in the model after calibrating $\Lambda^{35}(d)$. We use CPS data from 2000-2014 for this exercise since the CPS has a much larger sample size. We use ages 64-66 instead of only 65 to have more observations in the data. We use the CPS sampling weights, and while the CPS contains only non-institutionalized individuals, not many are in nursing homes at ages 64-66. We see in Table L.4 that our model does a very good job approximating the demographic distribution seen in the data. Table L.5 presents the calibrated distribution $\Lambda^{35}(d)$.

E.2 Initial Health

The initial distribution of health for households aged 35 is estimated using the MEPS. We keep all respondents aged 33-36 inclusive in order to have enough observations. The distribution is estimated by marital status, sex, education of the household, and for married women, by their age relative to the husband. The estimated distribution is presented in Table L.6. We observe that in general, singles and lower educated groups are less healthy.

E.3 Initial Assets

We use CEX data to estimate the initial assets distributions $A_{s,j=1}(g,e,\eta)$ and $A_{m,j=1}(j^*,e,\eta)$. We keep single households and married households with male heads aged 33-36, and divide these into demographic groups by: gender and education (singles) and education and relative age of the wife (married). We then divide each group into wealth deciles (which we assume correspond to our 10 permanent income types) and calculate mean total wealth in each decile. We use total household wealth adjusted to 2010 dollars.

F Survival Probabilities

Survival probabilities are given by $\rho_s(j,g,e,h)$ for single individuals, $\rho_m(j,e,h)$ for husbands, and $\rho^*_m(j^*,e,h^*)$ for wives. We use the HRS to estimate biennial survival probabilities for ages 55 to 109. We then use linear interpolation to obtain survival for ages 35 to 53, assuming that the survival probability is 1 at the age of 35.

The HRS contains information on the exact date of death for each respondent who dies during the survey period. We first construct an indicator variable equal to 1 if the respondent dies within 2 years of the current interview date, and equal to 0 if he/she is known to be alive 2 years later. We then run logit regressions of this indicator on various controls:

1. For those in good health, we estimate logit models that include age, age squared, and marital status, separately by education and sex.

2. For those in bad health and those with low disability, we estimate logit models that include age, age squared, and marital status, separately by sex. Differences across education groups are not statistically significant, so the predicted mortality probabilities from these regressions are assigned to both groups.

3. For those in a high disability state, we estimate logit models that include age and age squared, separately by sex. Differences across education and marital status groups are not statistically significant. The predicted mortality probabilities from these regressions are assigned to both education groups and to both single and married individuals.

The mortality probabilities used in the model are the predicted probabilities from these regressions. Note that we do not use sampling weights when estimating mortality since that would leave very few observations among the very old (nursing home residents have sampling weights of zero). Also, since there are very few observations for ages greater than 99, we assume that survival probabilities at these ages are the same as at age 99. Figures M.1 and M.2 plot the estimated biennial mortality probabilities by age, for men and women, respectively.

G Health Status Transitions

Health status evolves according to a Markov process that depends on age, marital status, sex and education. It is given by $H_s(h', h, j, g, e)$ for singles, $H_m(h', h, j, e)$ for husbands, and $H^*_m(h^{*'}, h^*, j^*, e)$ for wives.

We begin by estimating health transition probabilities for ages 35-63 using the MEPS. At these ages, we assume that health takes one of two possible states (Good or Bad), so we estimate a total of 4 transition probabilities.[37] The MEPS has five rounds of interview over a two year period, so we use information from Rounds 1 and 5 to estimate biennial health transition probabilities. We treat health in Round 5 as h' and heath in Round 1 as h. We condition on the age and marital status reported in Round 1.

For each value of h, we construct an indicator equal to 1 if the respondent was in that state in both Rounds 1 and 5, and equal to 0 if the respondent was in that state in Round 1 but not in Round 5. We then run logit regressions of these indicators on age, age squared and marital status, separately for each sex-education group. Sampling weights are used. Finally, we use the predicted probabilities from these regressions as our estimated transition probabilities.

We then estimate health transition probabilities for ages 63-109 using the HRS. Starting with the age of 65, disability states become possible, so we estimate a total of 4x4=16 transition probabilities. We construct indicator variables capturing each possible transition and run probit regressions of these indicators. For transitions from good health, we include age, age squared, age cubed, marital status, and run separate probit regressions for each sex-education group. For transitions from bad health, we have fewer observations, so we do not run the regressions separately, but instead include sex and education as controls in the same regression. For transitions from disability states, we run the probit regressions on age, age squared and age cubed separately

[37] Figure M.3 shows that the fraction of individuals younger than 65 with disabilities is very small.

by gender, but we do not control for education and marital status due to the small number of observations.[38] At ages 95 and over, the number of observations becomes too small. Predicting probabilities out of sample at these ages is problematic due to the sharp exponential increase in some transitions. We therefore set the health transition probabilities at these ages equal to those at age 93.

Figures M.4 to M.7 plot all the estimated health transition probabilities, separately for men and women. Note that there are small discontinuities between the ages of 61 and 63 when we switch from the probabilities estimated using MEPS to those estimates using the HRS. These discontinuities are in part due to the different data sets used, but mainly due to the fact that starting with age 63, it becomes possible to transition to disability states.

H Informal Care

H.1 Does IC vary with income or wealth?

A potential concern is that high income or high wealth households might choose to buy formal care rather than receive informal care. This might be due to preferences or a concern for the welfare of those providing the informal care. If this is the case, IC should be endogenous in the model. However, we find that IC does not significantly depend on income or wealth in most cases. We run a probit model of IC on income and wealth group controlling for Medicaid, age, sex, education, wife age (if married), and cohort and year effects. The results are presented in Table L.7. We see that only married women in the top wealth group have a significant lower IC probability. Otherwise, IC does not vary with wealth. Household income is significant only for singles, where higher incomes are associated with a lower probability of having IC. However, we note that the number of observations in these regressions is relatively small. Also, wealth is endogenous in these regressions because more periods spent in an LTC state without IC lead to lower wealth. Therefore, these results provide mainly descriptive evidence of a lack of correlation between IC and wealth.

I Income Profiles

We estimate household income profiles using CPS data (ASEC supplement) from years 1990-2007. The income variable used is constructed as total personal income minus income from welfare, interest, dividends and rent. We CPI adjust this to 2010 US dollars. For married households, we add up the incomes of the two spouses. We then apply a formula that approximates the after-tax household income.

We then construct subgroups defined by age, health (good or bad), education, marital status, sex (if single) and the relative age of the wife to that of the husband and her health (if married).

[38] We use sampling weights, so nursing home residents (who have 0 sampling weights) are excluded. While we tried to run all regressions without weights, we found that the results were very similar until very old ages, but at very old ages the estimated transitions were not reasonable. We therefore use the estimating with weights, and predict probabilities at very old ages (when many respondents are in nursing homes) out of sample.

Within each sub-group, we calculate the household's income decile. We keep all individuals aged 35 to 84 and use sampling weights. We ultimately want to estimate the average incomes within these deciles, in each sub-group.

To obtain smooth income profiles, we run an OLS regression of log after tax household income on age, age squared, age cubed, income decile (categorical), college, health, and a categorical variable capturing marital status, sex if single and the relative age of the wife and her health if married. The age and education variables are those of the household head in the case of married households. We obtain the predicted values from this regressions. We multiply them by 2 since our model period is 2 years. Since income profiles are almost flat after age 83 and there are few observations at old ages, we assume that incomes remain flat from age 83 until the terminal age of 109.

Figure M.9 shows samples of the estimated smooth income profiles.

J Medical Expenditures

Each individual's OOP medical expenditures are given by $ME(j,g,e,h)$. They depend on the individual's age, sex, and health and on the household's education.

We estimate out-of-pocket (OOP) medical expenditures using the MEPS for individuals younger than 65, and using the HRS for those aged 65 and over. All medical expenditures are estimated at the individual level. (Household medical expenditures are equal to the sum of its members' medical expenditures.) Medical expenditures are only estimated for good, bad and low disability health states. For the high disability state, they are set to zero, as we assume all expenditures become part of LTC costs.

In both data sets, we CPI adjust medical expenditures to 2010 dollars. In MEPS, total out of pocket medical expenditures are provided at the annual level, for both (consecutive) years of interview. Since the model period is two years, we add these annual expenditures together. We then run an OLS regression of the 2-year OOP medical expenditures on age, age squared, sex, education, and health, using all individuals aged 35 to 63.[39] In this regression, we use the age and health status measured in Round 1, which covers on average the first 3 months of the first year of interview. We then use the predicted values from this regression, for each state, to estimate $ME(j,g,e,h)$.

We use the HRS to estimate medical expenditures for individuals in households aged 65 and over. Since households with heads 65 and over can include women as young as 55 (10 years younger than the husbands) we estimate $ME(j,g,e,h)$ for ages 55 to 109. In waves 3 and later, the RAND HRS reports the total out of pocket medical expenditures since the previous interview date, so these expenditures are for a period of approximately 2 years. We run an OLS regression of these medical expenditures on age, age squared, sex, education and health, using sampling weights. The age and health status are those at the interview date just prior to the two years when the medical expenditures are incurred. We exclude all households who receive Medicaid since Medicaid is endogenous in the model. Table L.8 presents the regression coefficients from the

[39] Sex, education and health are included as categorical variables.

MEPS and HRS regressions.

K Notes on Calibration and Computation

K.1 Fraction of individuals on Medicaid: Gender Differences

Using the HRS, we tabulate the fraction of individuals in an LTC state who report receiving Medicaid benefits. We show that these fractions vary very little with age or sex. Table L.9 reports the fractions of highly disabled individuals receiving Medicaid by marital status and sex. We see that in general, the differences between men and women are very small. In addition, while it appears that for singles the fractions decrease with age, there is little variation by age for the married groups. Table L.10 shows the fractions on Medicaid only for highly disabled married individuals, conditional on the health state of the spouse. Again, in general the differences across genders and age groups are relatively small and/or non-systematic. In addition, we see that the fractions for individuals with spouses in Bad and Low Disability states are very similar, so we combine these groups. Table L.11 shows the fractions of LTC individuals on Medicaid, combining men and women. Differences by age groups are small and non-systematic, with the exception of singles. Given these findings, our targets on the fractions of highly disabled individuals on Medicaid are constructed aggregating all age groups and combining men and women. (Table L.12 also shows that gender matters very little when statistics are aggregated across age groups, and constructed by household wealth. Women have only slightly higher fractions on Medicaid than men.)

K.2 Assets

We use data on assets from the HRS. Assets are constructed by adding (1) the net value of non-housing financial wealth (HwATOTF) and (2) the net value of IRA and Keogh accounts (HwAIRA). In the HRS, the net value of non-housing financial wealth is calculated as the sum of the appropriate wealth components less debt. Specifically, it is the sum of (1) the net value of stocks, mutual funds, and investment trusts (HwASTCK), (2) the value of checking, savings, or money market accounts (HwACHCK), (3) the value of CD, government savings bonds, and T-bills (HwACD), (4) the net value of bonds and bond funds (HwABOND), (5) the net value of all other savings (HwAOTHR), minus the value of other debt (HwADEBT).

K.3 Medicaid: spousal impoverishment rules

The U.S. Department of Health and Human Services provides information on the special Medicaid eligibility rules that apply to married couples. These are as follows. If one spouse is in an institution such as a nursing home and the other spouse is still living in the community, special spousal impoverishment rules apply. These are designed to prevent the community spouse from becoming impoverished. The community spouse is allowed to keep a portion of the couple's assets, usually equal to one-half of the couple's combined assets, up to a maximum of $115,920 in 2013. In about half of the states, if the couple has less than that in total assets the community spouse can keep all of the couple's assets. Also, at least some of the institutionalized spouse's income can be protected for the community spouse to use. In 2013, the maximum amount of the institutionalized spouse's income that can be protected for the community spouse is $2,898 per month ($69,552 per 2 years - our model period).

K.4 Model Computation

We solve the model backwards using value function iteration. At each age (corresponding to the household head), we solve the model for 2 education groups, 10 permanent income groups, 2 genders (for singles), 4x4 health states (for the household heads and spouses), 2x2 informal care states (for the household heads and spouses if highly disabled), 3 possible relative ages of the spouse (if married), and 200 grid points for assets. We then use the optimal decision rules and simulate the life-cycle profiles of 200,000 individuals randomly drawn from the initial distributions at the age of 35. We use this to construct simulated moments which we compare to the empirical moments from the actual data.

L Appendix Tables

Table L.1: Descriptive Statistics, HRS

Panel A.	(1) Married	(2) Singles	(3) Widowed
Age	73.75	73.14	80.81
Female	0.44	0.66	0.81
Total Wealth	400088.87	210716.26	226317.34
HH Annual Income	72280.56	44365.96	31118.88
In LTC State	0.06	0.09	0.18
Has Medicaid	0.04	0.19	0.13
Observations	45522	11598	23230

Panel B.	(1) Married	(2) Singles	(3) Widowed
Age	78.53	77.62	85.37
Female	0.46	0.70	0.84
Total Wealth	250986.64	87758.62	138892.38
HH Annual Income	49221.26	26306.78	23758.47
ADLs (max=6)	2.48	2.42	2.73
IADLs (max=5)	3.11	3.06	3.45
Has Informal Care (IC)	0.82	0.53	0.54
Lives in NH	0.19	0.38	0.44
Nursing Home (>100 days/past 2 yrs)	0.16	0.34	0.40
Has Medicaid	0.19	0.49	0.34
Observations	3012	1216	4652

Notes: Panel A presents statistics on all households in the HRS where the head is 65+, for years 2000-2014, constructed using sampling weights. Households where a member has private LTC insurance are excluded. Panel B presents statistics keeping only highly disabled individuals.

Table L.2: Distribution of Wive's Ages when Husbands are 65, HRS

Age	Percent	Cumulative	Percent	Cumulative
	Non-College		College	
33	0.06	0.06	-	-
36	0.06	0.12	0.19	0.19
37	0.06	0.18	-	-
38	0.12	0.3	0.56	0.74
39	0.12	0.42	-	-
40	0.24	0.67	0.37	1.11
41	0.36	1.03	0.37	1.48
42	0.12	1.15	-	-
43	0.12	1.27	0.37	1.85
44	0.42	1.7	0.37	2.22
45	0.18	1.88	0.56	2.78
46	0.42	2.3	0.37	3.15
47	0.55	2.85	0.37	3.52
48	0.42	3.27	0.56	4.07
49	0.42	3.7	0.19	4.26
50	0.97	4.67	1.11	5.37
51	0.61	5.27	0.74	6.11
52	0.97	6.24	0.37	6.48
53	1.39	7.64	1.11	7.59
54	2.55	10.18	1.85	9.44
55	3.45	13.64	3.33	12.78
56	3.03	16.67	3.15	15.93
57	3.52	20.18	3.52	19.44
58	4.91	25.09	3.52	22.96
59	7.27	32.36	5.56	28.52
60	7.39	39.76	7.96	36.48
61	10.48	50.24	11.48	47.96
62	10.12	60.36	8.7	56.67
63	10.91	71.27	11.85	68.52
64	8.79	80.06	10.37	78.89
65	7.58	87.64	10.56	89.44
66	3.76	91.39	3.52	92.96
67	3.03	94.42	1.48	94.44
68	1.21	95.64	1.48	95.93
69	1.09	96.73	1.48	97.41
70	0.61	97.33	0.37	97.78
71	0.55	97.88	0.56	98.33
72	0.48	98.36	0.19	98.52
73	0.55	98.91	0.74	99.26
74	0.36	99.27	-	-
75	0.18	99.45	0.37	99.63
76	0.18	99.64	0.19	99.81
77	0.06	99.7	0.19	100
81	0.06	99.76	-	-
83	0.12	99.88	-	-
85	0.06	99.94	-	-

Table L.3: Mean and Median Ages for Wives Within Groups, HRS

Age Group	Mean Age Non-College	Mean Age College	Median Age Non-College	Median Age College
33-57	52.8	52.3	54	55
58-64	61.4	61.6	61	62
65+	67.3	66.8	66	66

Notes: The women in this sample are married to husbands who are 65 years old.

Table L.4: Distribution of Households, Age of Head 64-66, Data (CPS) and Model

Marital Status	Sex	Education	Wife Relative Age	CPS	Model
single	f	college	-	6.1	5.8
single	f	non-college	-	24.1	22.9
single	m	college	-	4.3	3.6
single	m	non-college	-	12.3	12.0
married	-	college	-10	2.9	3.7
married	-	college	-4	9.6	9.8
married	-	college	+2	4.9	5.0
married	-	non-college	-10	5.8	6.3
married	-	non-college	-4	19.1	20.5
married	-	non-college	+2	10.8	10.4

Notes: The wife's relative age equals to the age of the wife minus the age of the husband. The distribution is constructed using only singles and married men aged 64-66.

Table L.5: Calibrated Distribution of Households at Age 35

Marital Status	Sex	Education	Wife Relative Age	Distribution (%)
single	f	college	-	3.2
single	f	non-college	-	10
single	m	college	-	2.0
single	m	non-college	-	10.5
married	-	college	-10	4.5
married	-	college	-4	10.7
married	-	college	+2	5.7
married	-	non-college	-10	10.0
married	-	non-college	-4	31.7
married	-	non-college	+2	11.6

Table L.6: Initial Distribution of Health, at Household Age 35, MEPS

Marital Status	Sex	Education	Wife Relative Age	% by Health	
				Good	Bad
single	m	non-college	-	0.86	0.14
single	m	college	-	0.95	0.05
single	f	non-college	-	0.80	0.20
single	f	college	-	0.92	0.08
married	m	non-college	-	0.90	0.10
married	m	college	-	0.97	0.03
married	f	non-college	-10	0.86	0.14
married	f	college	-10	0.94	0.06
married	f	non-college	-4	0.87	0.13
married	f	college	-4	0.96	0.04
married	f	non-college	2	0.87	0.13
married	f	college	2	0.96	0.04

Notes: The initial distribution is calculated keeping respondents aged 34-36 inclusive.

Table L.7: Probit Regression Results of Informal Care on Income and Wealth

	Singles	Married M	Married W
HH Income	-0.007***	-0.002	0.001
	(0.001)	(0.002)	(0.002)
Wealth group =2	0.161	-0.102	-0.216
	(0.131)	(0.248)	(0.253)
Wealth group =3	0.113	0.140	-0.346
	(0.194)	(0.307)	(0.289)
Wealth group =4	0.167	0.194	-0.019
	(0.152)	(0.286)	(0.265)
Wealth group =5	0.237	0.353	-0.545**
	(0.151)	(0.289)	(0.243)
HH has Medicaid	-0.331***	-0.710***	-1.150***
	(0.086)	(0.196)	(0.184)
Year Effects	Yes	Yes	Yes
Cohort Effects	Yes	Yes	Yes
Age Effects	Yes	Yes	Yes
Educ & Sex (& Wife age if married)	Yes	Yes	Yes
Observations	1340	368	460

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table L.8: OLS Regression of OOP Medical Expenditures, MEPS and HRS

	MEPS	HRS
age	-46.346***	-171.629**
	(4.376)	(87.343)
agesq	1.023***	1.318**
	(0.056)	(0.582)
female	459.152***	426.899***
	(16.015)	(87.144)
college	448.631***	990.517***
	(18.664)	(102.054)
health=bad	968.763***	1460.437***
	(38.008)	(122.893)
health=low disability		2059.815***
		(438.195)
R^2	0.079	0.006

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Notes: In MEPS, the regression are estimated using individuals aged 35 to 63. In the HRS, they are estimated using individuals aged 65 to 99. OOP medical expenditures cover a period of 2 years and are CPI adjusted to 2010 dollars.

Table L.9: Fraction of Highly Disabled Individuals Receiving Medicaid, by Sex and Marital Status, HRS

		Single		**Married**
Age Group	**Male**	**Female**	**Male**	**Female**
65-69	0.66	0.68	0.29	0.25
70-74	0.47	0.60	0.31	0.31
75-79	0.48	0.49	0.30	0.29
80-84	0.44	0.43	0.18	0.34
85+	0.36	0.47	0.27	0.26

Table L.10: Fraction of Highly Disabled Individuals Receiving Medicaid, if Married, by Spouse Health, HRS

Wives				**Health Spouse**
Age Group	**Good**	**Bad**	**Low Disability**	**High Disability**
65-69	0.12	0.36	0.33	0.71
70-74	0.23	0.36	0.44	0.60
75-79	0.22	0.29	0.50	0.67
80+	0.17	0.32	0.55	0.59
Husbands				**Health Spouse**
Age Group	**Good**	**Bad**	**Low Disability**	**High Disability**
65-69	0.21	0.38	0.33	0.50
70-74	0.19	0.43	0.44	0.67
75-79	0.16	0.47	0.22	0.67
80+	0.18	0.24	0.18	0.53

Table L.11: Fraction of Individuals with LTC Needs Receiving Medicaid, HRS

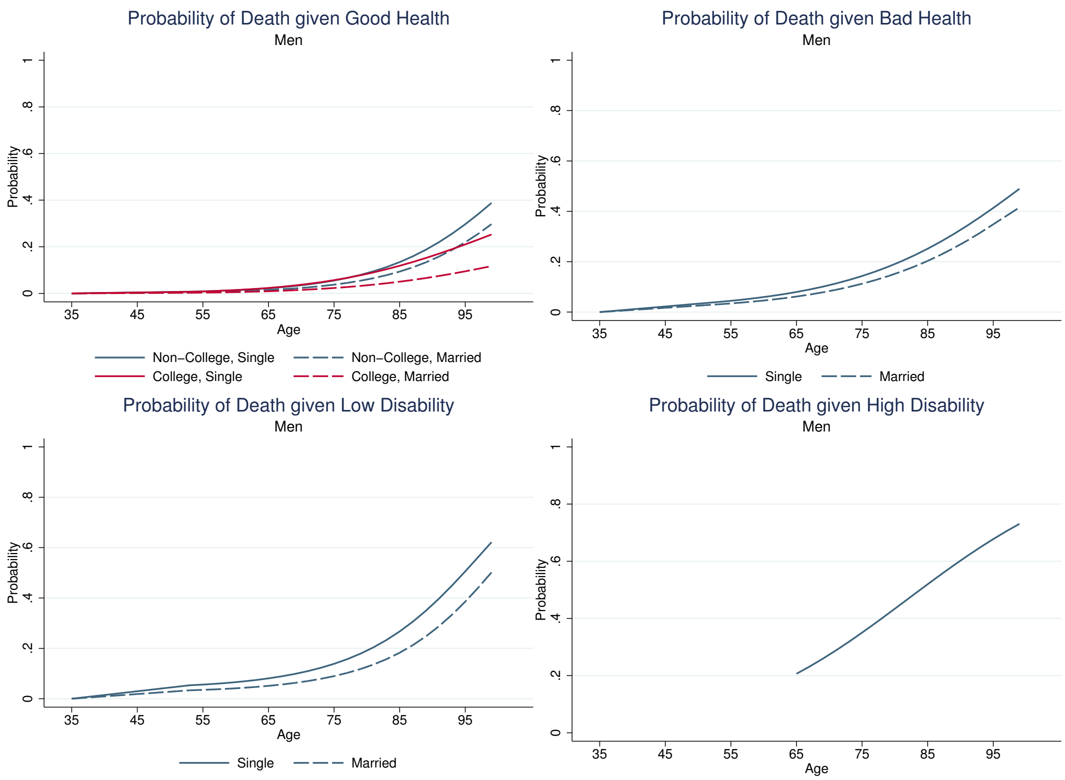
	Single	Married		Married, by Spouse Health	
Age Group	All	All	Good	Bad/Low disability	High disability
65-69	0.68	0.27	0.16	0.36	0.60
70-74	0.56	0.31	0.21	0.40	0.63
75-79	0.48	0.30	0.18	0.39	0.67
80-84	0.43	0.25	0.15	0.32	0.70
85+	0.45	0.26	0.21	0.27	0.49

Table L.12: Fraction of Individuals with LTC Needs Receiving Medicaid, HRS

	Single	Married		Married, by Spouse Health	
Sample	All	All	Good	Bad/Low disability	High disability
All	0.47	0.28	0.18	0.35	0.59
All, Wealth<120,000	0.54	0.36	0.25	0.41	0.76
All, Wealth<70,000	0.57	0.39	0.27	0.44	0.80
Men	0.43	0.27	0.18	0.34	0.57
Men, Wealth<120,000	0.52	0.34	0.24	0.39	0.73
Men, Wealth<70,000	0.54	0.37	0.26	0.42	0.73
Women	0.48	0.29	0.18	0.36	0.62
Women, Wealth<120,000	0.55	0.38	0.26	0.44	0.79
Women, Wealth<70,000	0.57	0.41	0.28	0.47	0.79

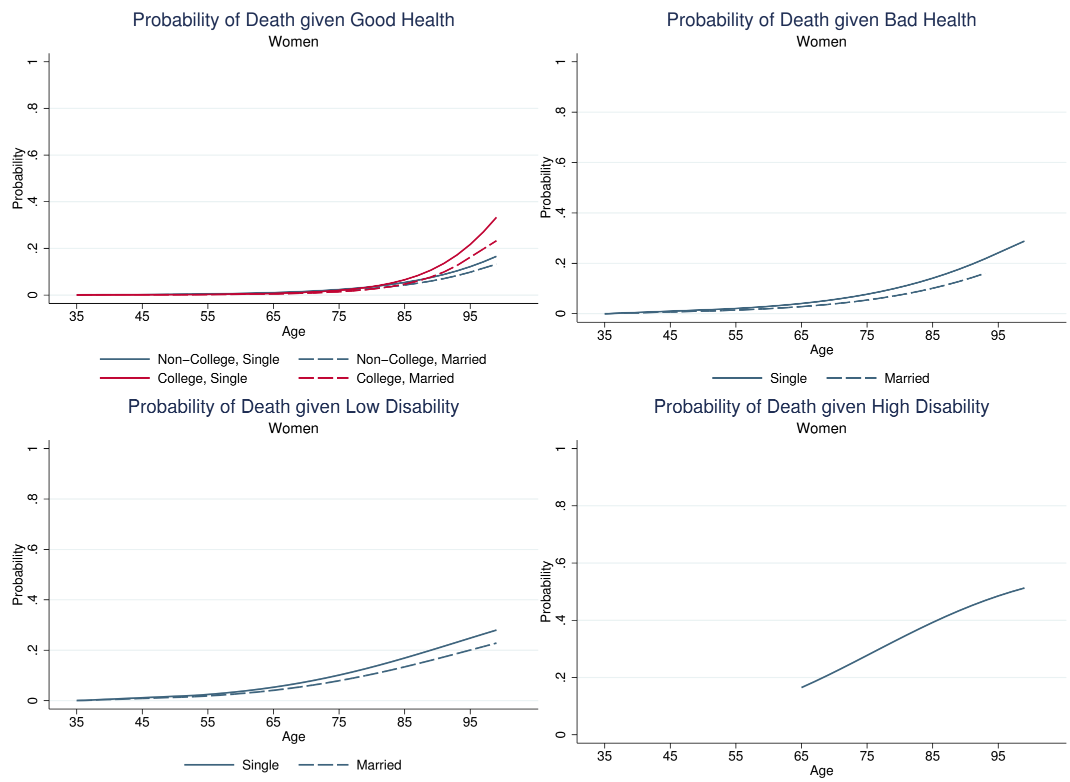
M Appendix Figures

Figure M.1: Estimated Biennial Mortality Probabilities, Men, HRS



Notes: We use the HRS to estimate biennial survival probabilities for ages 55 to 109. We then use linear interpolation to obtain survival for ages 35 to 53, assuming that the survival probability is 1 at the age of 35. Mortality probabilities for ages 101-109 are assumed to be equal to those at age 99. High disability is only possible at ages 65+ in the model.

Figure M.2: Estimated Biennial Mortality Probabilities, Women, HRS



Notes: We use the HRS to estimate biennial survival probabilities for ages 55 to 109. We then use linear interpolation to obtain survival for ages 35 to 53, assuming that the survival probability is 1 at the age of 35. Mortality probabilities for ages 101-109 are assumed to be equal to those at age 99. High disability is only possible at ages 65+ in the model.

Figure M.3: Fractions by Health and Disability, HRS

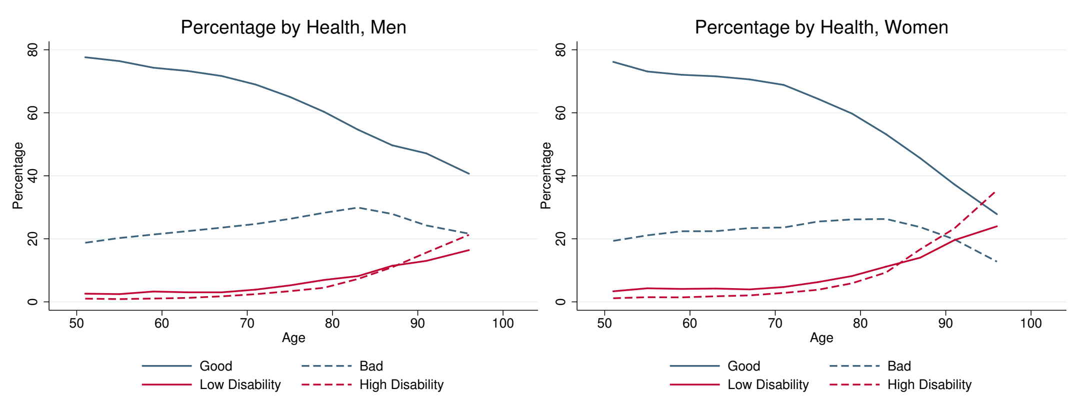
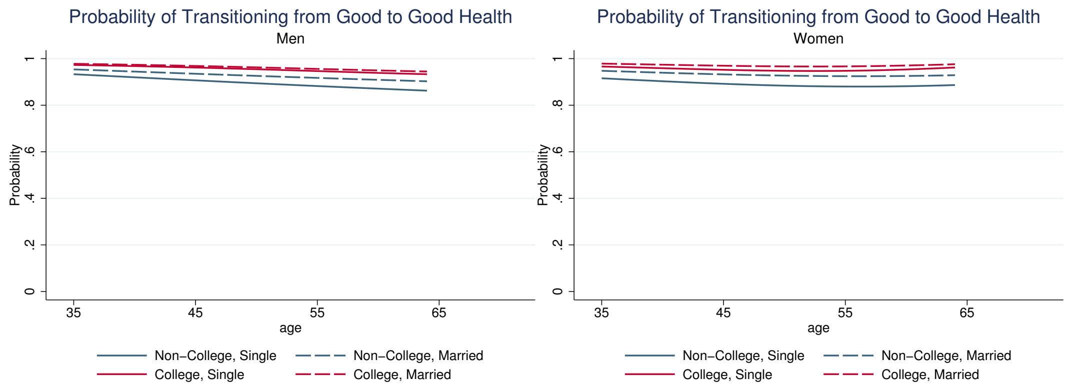


Figure M.4: Health Transitions from Good Health, MEPS



Notes: MEPS data. Since we do not allow for low or high disability states before age 65, the probabilities of transitioning from good to bad health are equal to one minus the levels shown in the above figures.

Figure M.5: Health Transitions from Bad Health, Men, MEPS and HRS

Notes: MEPS data at ages 35-61 and HRS data at ages 63+. The discontinuities at age 63 arise since low and high disability states become possible starting with age 65 in the model.

Figure M.6: Health Transitions from Bad Health, Women, MEPS and HRS

Notes: MEPS data at ages 35-61 and HRS data at ages 63+. The discontinuities at age 63 arise since low and high disability states become possible starting with age 65 in the model.

Figure M.7: Health Transitions from Low and High Disability States, HRS

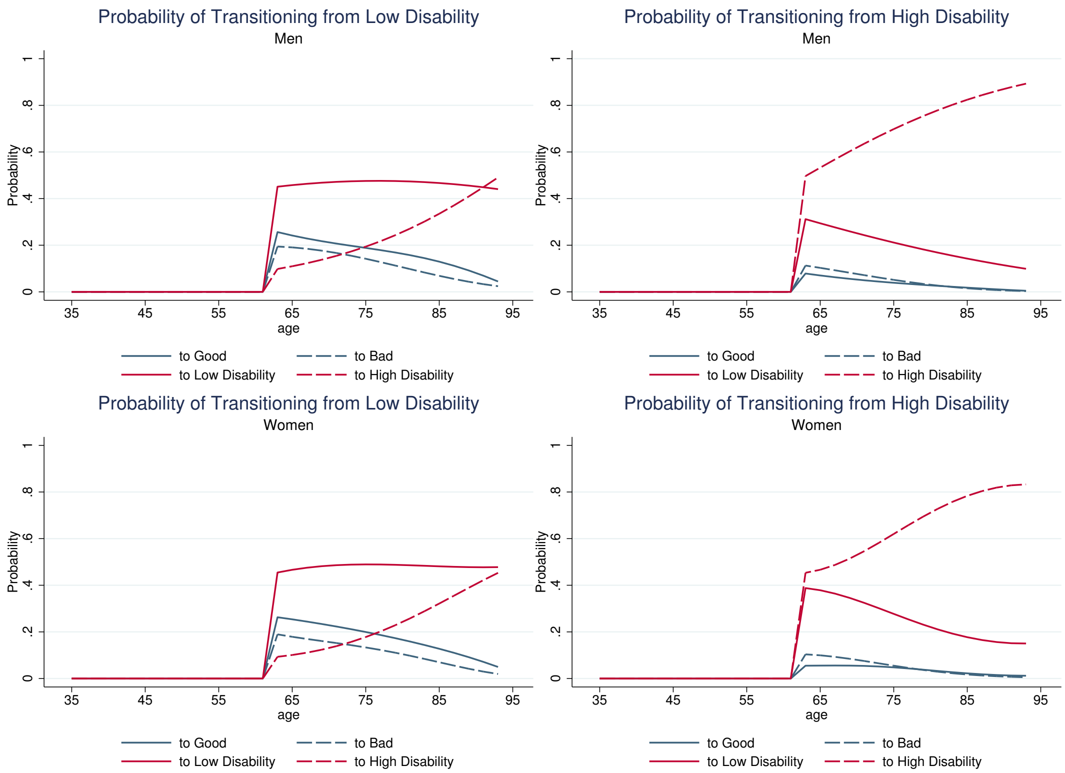
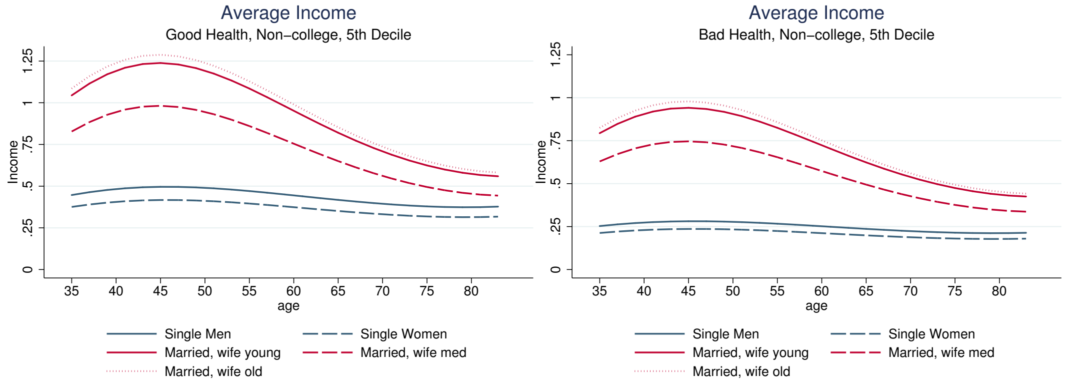


Figure M.8: Household Income Profiles, CPS

Notes: Annual household incomes in thousands of 2010 US dollars, averaged over years 1990-2007. Income includes all income minus income from welfare programs, and from interest, dividends, and rent.

Figure M.9: Household Income Profiles, 5th decile, Non-College, by Health, CPS



Notes: The figures show 2-year household income (after-tax), normalized by dividing by $105,430 to convert to model units.