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The link between individual expectations and savings: Do nursing home expectations matter?[1]

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Abstract

Preparing for the end of life, especially for the prospect of needing long-term care, is an important issue facing older Americans. Those who reach age 65 have a 40% chance of going into a nursing home in their remaining lifetime, and about 10% of those who do will stay there for at least five years. The costs of a stay are high with on average US$70,000 annually for a private room. Long-term stays in nursing homes are, therefore, not likely, but very expensive. In this paper, we examine individual expectations about future nursing home entry and study the relationship between these expectations and savings behavior, using data from the Health and Retirement Study. We find a clear relation between subjective expectations and probability of future nursing home entry, and a positive effect of these expectations on savings behavior. Surprisingly, we find no difference of this effect by wealth group, so it seems that Medicaid eligibility in the context of nursing home entry plays no factor in the decision to save.

Key words: expectations, nursing home, savings

JEL Codes: D12, J14, J26

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1 Introduction

The prospect of needing long-term care is an important issue facing older Americans. Those who reach age 65 have a 40% chance of going into a nursing home in their remaining lifetime, and about 10% of those who do will stay there for at least five years.[3] About 1.6 million Americans were in a nursing home in 2004, out of which 72% were women. The costs of a stay are high; on average there are US$60,000 and US$70,000 annually for a semiprivate and a private room, respectively, and vary widely between regions (MetLife 2004).[4] Long-term stays in nursing homes are, therefore, not very likely, but very expensive.

Medicaid, the only governmental program that pays for nursing home care, has strict asset and income requirements for eligibility, although it gives spouses of residents in nursing homes an additional allowance not subject to the eligibility requirements. This risk of going into a nursing home increases with age, and people who go often have some form of dementia. Studies have found dementia among as much as half of those admitted to a nursing home (Banaszak-Holl et al. 2004; Magaziner et al. 2000).

Individuals can prepare financially for the case of admission into a nursing home in two ways: first, by changing their savings behavior, either increasing their saving, or decreasing their saving so as to benefit from Medicaid earlier; and second, by taking out private long-term care insurance. Individuals wanting to take out long-term care insurance, however, face a variety of obstacles: high premiums, which rise rapidly with age, rate increases, often no inflation protection, time and upper limits of benefits, and denied coverage because of pre-existing conditions. So it is not surprising that long-term care insurance finances only about 3% of nursing home costs (Johnson and Ucello 2005).

The Health and Retirement Study (HRS) asks respondents, besides a wide variety of other questions, about their subjective probability of moving to a nursing

[3] U.S. Department of Health and Human Services, cited by the official Medicare website http://www.medicare.gov.

[4] This number might increase in the future because of longer life expectancies and lower birth rates, but it could also decrease because of medical advances and increased emphasis on home care. For example, aging could decrease nursing home demand if it raises the supply of non-market care supplied by elderly women to elderly men (Lakdawalla and Philipson 2002).

home in the future. This allows us to study the relation between individual expectations and behavior as well as actual admission to a nursing home.

Specifically, we are interested in two questions: First, do individuals have a sensible idea about their own probability of going to a nursing home? Second, is individual savings behavior affected by these expectations? We are especially interested in better understanding if individuals' possibly low level of preparedness for the cost of long-term care is the result of a lack of knowledge or of a lack of acting on it.

This study gives insights into complex individual decisions which involve assessing nursing home entry risk, the necessity to save, and then actually execute these decisions.[5] Research in behavioral economics has shown that individuals tend to procrastinate in executing unpleasant decisions (O'Donoghue and Rabin 2001, and Frederick, Loewenstein, and O'Donoghue 2002). The probability of going to a nursing home falls in this category – the outcome of saving more is unpleasant. In addition, future nursing home entry, and the connected factor of aging, might be something individuals would rather not think about too much.

Subjective expectations have been used more and more in economics as they have become available through surveys since the beginning of the 1990's (see Manski 2004 for an introduction and literature survey, and Bernheim 1990). Expectations give additional information about individual decision processes, above and beyond objective variables such as age or income, and can be used to relax (or validate) assumptions on expectations (see, for example, Benitez-Silva and Dwyer, forthcoming, and Dominitz 2001).

Subjective expectation data solicited through surveys has its shortcoming. The survey questions ask in most cases about the subjective probability of an event. Answers to these types of questions are often rounded (such as 25% rather than 23%), influenced by anchors in the questioning (such as initial values in unfolding bracket questions or previous questions), and there is also in some cases bunching at the answer of 50%, probably reflecting underlying uncertainty rather than a 50/ 50 chance. Another problem is, depending on the question, a high number of "don't

[5] We disregard in this paper the distinction between information and knowledge, although it is the latter that influences expectations. This distinction goes beyond the scope of this paper, but see the Information-Knowledge Symposium (2005) in EconWatch 2(1) for a discussion of the distinction.

know" or "refuse" answers. Answers with these characteristics are difficult to interpret, and these problems are difficult to test for and solve in empirical estimations (see van Soest and Hurd 2004a and 2004b). In addition to these problems, most questions do not elicit measures of the degree of uncertainty surrounding the event in question, and interpersonal comparability of such answers might be limited (Dominitz and Manski 1997). Although we share these concerns and will address them as possible in our analysis, the use of subjective expectation data can still provide additional insight to a better understanding of individual behavior and decision-making, and therefore is of value for research and policy-making, its limitations notwithstanding.

There has been a variety of research using subjective expectation data, which has shown that expectations are often linked to the probability of outcomes (see, for example, Hurd and McGarry 2002, Maestas 2004, and Stephens 2004). There is also a still small but growing literature analyzing the link between subjective expectations and economic behavior (see also Hamermesh 2004). For example, Nicholson and Souleles (2001) relate income expectations of medical students and their specialty choices, and find that a higher income expectation increases the probability of a specialty being chosen, even if students are misinformed. In a similar approach, Stephens (2004) links job loss expectations, outcomes, and consumption behavior. Although he finds a clear link between job loss expectations and outcomes, he finds no clear link to consumption behavior. Hurd, Smith, and Zissimopoulos (2004) find a link between subjective survival probabilities and retirement and social security claiming, although the effects are small.

We are extending this literature in several ways. First, we use subjective expectations of moving into a nursing home in the future, which is an important and relevant risk for older individuals. Second, we analyze not only how well these expectations predict future nursing home entry, but also the effect of these expectations on savings behavior.

Our results show a clear relation between expectations of moving into a nursing home and the actual probability of going into one in the future. We also find a positive relation between nursing home expectations and savings rates. We find no evidence of a different effect by wealth levels, and no evidence of systematic dissaving.

After a description of the data we use, we first assess if the subjective nursing home probabilities predict actual outcomes to assess the validity of the expectation variable. Then, we examine if these expectations influence savings behavior, under special consideration of the heterogeneity of the respondents. As usual, the final section concludes.

2 The Data and Sample Selection

We are using data from the Health and Retirement Study (HRS) from 1992-2002 and from all available cohorts.[6] The HRS is a biennial survey, which was started in 1992 with a national sample of 7,600 households with at least one individual born between 1931 and 1941. These individuals as well as their spouses are interviewed biennially. Blacks, Hispanics, and Florida residents are oversampled. The HRS is a comprehensive survey that collects information in a variety of areas, including demographics, health, retirement and pensions, and a variety of subjective expectations. In 1998, two more birth cohorts and their spouses were added, the Children of the Depression (CODA), born between 1924 and 1930, and the War Babies (WB), born between 1942 and 1947. In 1998 the HRS was merged with its companion study, the Study of Assets and Health Dynamics Among the Oldest Old (AHEAD). AHEAD is, as the HRS, a national panel study and it oversamples the same populations. It was started in 1993 with an initial sample of 7,447 respondents born in 1923 or earlier and their spouses, and was again conducted in 1995.[7]

The main variable of interest to us in this paper is the subjective probability of moving to a nursing home (from now on referred to as "nursing home expectation").

The respondents were asked one of the following questions, depending on their age:

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[6] The HRS and AHEAD are sponsored by the National Institute of Aging and conducted by the University of Michigan. We are using the data files produced by the RAND Center for the Study of Aging (RAND HRS Data, Version E, and enhanced fat files) and the exit data files from the University of Michigan. The RAND HRS Data file is an easy to use longitudinal data set based on the HRS data. It was developed at RAND with funding from the National Institute on Aging and the Social Security Administration. We are using the public use data set. The 2002 exit data is Early Release data. These data have not been cleaned and may contain errors that will be corrected in the Final Public Release version of the dataset.

[7] See Juster and Suzman (1995) and the HRS website at http://hrsonline.isr.umich.edu/ for an overview of the HRS and AHEAD.

"What is the percentage chance that you will ever have to move to a nursing home?" or *"What is the percentage chance that you will move to a nursing home in the next five years?"*

All respondents in the waves from 1993 to 2002 were asked one of these two questions; in 1992, only a small subsample of the respondents was asked. The earlier waves of the HRS and AHEAD have some variations in who was asked which of the two questions. In 1993, 1994, and 1995 all respondents were asked about the probability that they would move to a nursing home in the next five years. In the following years, only respondents over age 69 (1996) or 64 (1998 onwards) were asked this; the younger respondents were asked the probability of *ever* moving to a nursing home. For consistency and taking into account the age structure of the respondents, we only consider the answers to the question of moving within the next five years and from 1993 to 2002. In addition, the questions were only asked if the respondent herself, rather than a proxy respondent, answered the survey. Excluding these respondents and one respondent with most of the demographic information missing, our working sample includes 15,412 respondents, including those who answered "don't know" or "refuse" to the question about nursing home expectations within the next five years.[8]

Starting with HRS 1994, the respondents were given the following definition of nursing homes:

"Nursing homes are institutions primarily for people who need constant nursing supervision or are incapable of living independently. Nursing supervision must be provided on a continuous basis for the institution to qualify as a nursing home. Please don't include stays in adult foster care facilities or other short-term stays in a hospital."

In the first two waves of AHEAD the following sentence was added before the question instead of the previous explanation:

"*Of course, nobody wants to go to a nursing home, but sometimes it becomes necessary*."

[8] The respective numbers (including those who answered "don't know" or "refuse") by cohort are as follows: AHEAD 7558, CODA 2217, HRS 5496, WB 37, overlap cases AHEAD and HRS 104.

The tone of the questions allows for the interpretation that respondents did not confuse nursing homes with, for example, assisted living facilities.[9]

We also have information about a nursing home stay of deceased respondents through exit interviews with proxy respondents, which we include in our nursing home entry measures in the next part of the paper.

3 Do subjective nursing home expectations matter?

The first question to answer when using subjective expectation data is if the expectations have predictive power for the actual outcome. We will assess this by using multivariate analysis to see if the subjective probability of moving to a nursing home is an economically and statistically significant predictor for actual entry.[10] We start this section with an overview of the responses to the nursing home expectation question and of the factors affecting nursing home entry.

3.1 The expectations about nursing home entry

So what are the reported subjective probabilities of nursing home entry? Table 1 shows the means by wave as well as the percentage of focal point answers. The means lie between 11.5% and 17.3%, and are lower for men (not shown), who also have a lower risk of nursing home entry. They are much higher for those individuals with worse self-reported health, and the relationship is strictly monotonic in all waves. For example, the mean of subjective nursing home expectation of those in excellent or very good health in wave 4 is 9.5%, while those reporting poor or fair health have a mean of 15.6%.

Individual answers range from 0 to 100, with rounding to the nearest 5% between the values of 15 and 95. Focal point answers of 0 and 50 are common. We interpret an answer of zero as a very low probability assigned to moving to a nursing home, since there is evidence, especially in later waves, that those individuals are in better health than others. An answer of 50% could mean that individuals assign a

[9] See also Bassett (2004, 12).

[10] Another way to check the validity of explanations is to see whether expectations and actual entry are influenced by the same variables. Lindrooth, Hoerger and Norton (2000), using the first two waves of AHEAD, have found that the covariates explaining expectations about nursing home entry are consistent with the characteristics of those going to a nursing home. Holden, McBride and Perozek (1997) found similar evidence using the first wave of HRS.

50% chance to moving to a nursing home (that is, give a high probability) or could be an expression of high uncertainty. Very few respondents gave an answer above 50%; less than 5% with the only exception being wave 3, with 7%. The self-reported health status is worse for those who gave a 50% probability than for those who gave a lower probability, and lower than for those with a higher than 50% probability of moving to a nursing home. These statistically significant differences give some support for the thesis that the 50% might be the result of rounding rather than of uncertainty.[11]

Table 1: Summary Statistics of the Subjective Probability of Moving to a Nursing Home in the next 5 Years

	Mean Probability (in %)				Answers (in %)			
	All	Self-reported health			0	>0 & <50	50	>50
		Very good or excellent	Good	Poor or fair				
Wave 2 (N=9357)	11.47 (0.22)	8.69 (0.30)	11.10 (0.39)	15.60 (0.48)	64.07	22.61	9.43	3.89
Wave 3 (N=5607)	17.30 (0.33)	14.13 (0.48)	17.56 (0.57)	21.01 (0.68)	50.86	28.86	13.39	6.88
Wave 4 (N=8249)	12.20 (0.23)	9.48 (0.33)	11.81 (0.39)	15.56 (0.47)	62.42	22.58	11.86	3.14
Wave 5 (N=8158)	14.04 (0.24)	11.59 (0.34)	13.73 (0.42)	18.03 (0.54)	55.00	28.52	12.20	4.29
Wave 6 (N=8301)	13.74 (0.24)	11.12 (0.33)	13.68 (0.40)	17.53 (0.52)	53.67	30.54	11.91	3.88

Note: Standard errors of the mean in parentheses. In waves 4, 5, and 6 only individuals aged 65 and above were asked this question, in wave 2 every respondent, and in wave 3 those at or above age 70. Includes all cohorts. AHEAD 1993 was added to wave 2 HRS and AHEAD 1995 to wave 3 HRS. See text for sample selection. There are between 2 and 5 respondents per wave in the working sample with a missing self-reported health variable.

Non-response rates are low. Refusal rates were very low with under 1% (under 3% in wave 2), while "don't-know" rates were under 10%. These individuals seem at higher risk than those giving probabilities under 50% (see Section 3.3 for a more detailed discussion). It is interesting to look at the pattern over time of these item non-responses by individual. Considering all individuals who answered "don't

[11] We conduct our analyses both with and without these observations to account for the possibility of the answers of 50% being the expression of uncertainty rather than rounding.

know" or "refuse" to any of the nursing home probability questions and who were alive in the next wave, we find that only between 16% and 23% of individuals, depending on the wave, gave the same answer ("don't know" or "refuse") in the next wave. A few respondents (under 10 in each wave and for both questions) switched to the other non-response, that is from "don't know" to "refuse" or the other way around. The biggest percentage of respondents, between 40% and 50%, gave a numerical answer in the next wave. Around one third of the respondents who gave "don't know" or "refuse" did not answer the question in the next wave.

Table 2: Comparison of the Subjective Probabilities of Moving to a Nursing Home in the next 5 Years (Wave 4 and Wave 5)

Probability Comparison	% of Total Respondents
Wave 4 > wave 5	19.97
in wave 5 = 0	10.90
in wave 5 > 0	9.06
Wave 4 < wave 5	29.41
in wave 4 = 0	19.17
in wave 4 > 0	10.24
Wave 4 = wave 5	50.62
Both = 0	42.73
Both = 50	4.00
Both = 100	0.10
Both = some other value	3.79

Includes only respondents who answered the question in both interviews.
N= 6300. Including +/- 1 in the "=" category changes the results only very slightly.

Another question of interest is by how much individuals changed their responses from wave to wave. About half of all respondents did not change their answer from one wave to another (see Table 2 for a comparison of waves 4 and 5). There is no clear pattern of different reports of health changes for those who gave a higher or lower probability than in the previous wave, but there are many other possible causes for a change in expectations. Something to keep in mind when considering changes of probability over time is that the time frame of the question (within the next five years) also changes. Since the question asks only about the total probability within the next five years, individuals might have different probabilities

over this period, such as a high probability for the next year after a recent fall, and the probabilities might therefore change because the period for which the probability applies has also changed.

3.2 Variables affecting nursing home entry

There is a variety of well-established predictors of future nursing home entry (Banaszak-Holl et al 2004, Freedman 1996, Friedman et al. 2 005, and Russell et al. 1997), including age, gender, income, net worth, and education. Education, low income and age have been found to be positively associated with nursing home entry, while net worth is negatively associated. Women are more likely to be admitted than men. Ethnicity also plays a role; Whites are more likely to be admitted into a nursing home than African-Americans, Asians, and Latinos. Individuals living alone are more likely to be admitted, as are individuals without living children[12] or living siblings. Physical and mental health variables are important predictors, including having activity-of-daily-living impairments (ADL's) or instrumental-activity-of-daily-living impairments (IADL's), and being cognitively impaired. There is also some evidence that individuals in rural areas are more likely to go into a nursing home, which could be related to the higher quality of nursing home care there (Phillips et al 2004).

These variables translate into the following variables available in the HRS and AHEAD: Age, gender, race (white, black, other), education dummies, a dummy for low household income, net worth (including or excluding housing)[13], marital status, number of living children, number of living siblings, number of ADL's (dummies for none, 1-3, and 4 or more) and number of IADL's (dummies for 0, 1, and 2-3)[14].[15] and self-reported health status (on a 1 to 5 scale with 1 being excellent, 3 being good, and 5 being poor), self-reported change in health (from 1 – much better – to 5 – much worse). We collapse these two variables for our analyses into dummies for being in fair/ poor health and being in worse health. We know if the respondent has been in a

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[12] See Russell et al (1997, 575) for an overview of the literature.

[13] We use the model-based imputations of wealth and income as provided by RAND for missing observations.

[14] The ADL's included in this measure are having some difficulty bathing, dressing, eating, getting in and out of bed, and walking across a room. The IADL's included in this summary measure are having some difficulty using the phone, managing money, and taking medicine.

[15] We do not use subjective survival probabilities in the analyses since the question differed by age of respondents, and asked either for the survival probability to age 75, age 85, or of approximately the next 10 years resulting in very small sample sizes.

nursing home since the last wave or is currently living in one. Unfortunately, there is no information in the public use HRS data available about the state of residence and the degree of urbanization of the residence.

3.3 Do expectations predict nursing home entry?

To assess if nursing home expectations are a good predictor of actual nursing home entry, we use only the AHEAD cohort and as the baseline the expectations in wave 2. Using the earliest possible wave allows us to follow individuals as long as possible; using the AHEAD cohort allows us to use the answers in wave 3, which were asked of the HRS respondents only if they were at or above age 70, which the vast majority of them was not. We compare the subjective expectations from 1993 with cumulative outcomes in 1998, which encompasses the same time span as the question. Note, however, that the time difference for AHEAD respondents from 1993 to 1998 is less than three years, since the interviews took place in November 1993 and February 1998 (Willis 1999: 126).

We use two different measures of actual entry into a nursing home, which both include nursing home stays since the last interview, including of those who passed away. The first measure is having been or still being in a nursing home since the last interview. This measure includes many short-term stays; of those alive in the following wave, about two thirds of all stays in a nursing home were shorter than 30 days, a number that is increasing over time to 72% in wave 6. Note, however, that such-defined short-term stays may be ongoing stays. Measure 2 is "living in a nursing home" at the time of the interview. Of those answering yes to this question, 10%-14% have left the nursing home in the next wave; out of those, about 25% die before the following wave. Between 34% and 40% are still in a nursing home in the next wave; the others have died. The question about nursing home expectations asks about the probability of a move to a nursing home, so that the second measure is the more accurate comparison. However, since moving does not imply a final move, we think that the two measures can be thought of as boundaries of the actual event in question.

A look at the mean nursing home expectation by actual entry is informative (see Tables 3a and 3b). Table 3a shows the subjective probabilities for those who had a nursing home stay since the last stay (and might still be there at the time of the interview) and those who did not, while Table 3b shows them for those who were

currently living in a nursing home at the time of the interview and those who were not. The means are 6%- to 9%-points higher for those who actually went into a nursing home before the next wave than for those who did not. The overall mean subjective probability given in wave 2 for moving to a nursing home in the next five years (13.95%) is slightly higher than the actual entry percentage at 5 years later as measured by nursing home stays (13.29%) and higher than the percentage as measured by currently living in one (8.91%). Remember, though, that the time span was closer to four years because of the timing of the interviews. Two years later, that would be, the cumulative entry percentage is remarkably close to the average probability, with 13.89%. So it seems that, if anything, individuals are on average slightly overestimating their probability of entry, but the difference is very small and could be the result of rounding off of probabilities if individuals tend to round up rather than down.

Table 3a: Mean Subjective Nursing Home Probabilities by Actually Having Been In One

	Overall Probability	**Entry 1 wave later ***	**No Entry 1 wave later ***	**% with Entry 1 wave later**	**Cumulative Entry as % of initial sample**
Wave 2 (N=6013)	13.95% (0.30)	20.85% (1.50)	13.50% (0.30)	6.12%	6.12%
Wave 3 (N=4559)	17.30% (0.36)	23.89% (1.54)	16.75% (0.37)	7.70%	13.29%
Wave 4 (N=3526)	14.92% (0.39)	21.39% (1.62)	14.26% (0.39)	9.22%	20.16%
Wave 5 (N=2917)	17.59% (0.45)	23.00% (1.56)	16.85% (0.47)	12.03%	27.82%

**The means are statistically different at the 1% level (unequal variances permitted). Standard errors of the mean in parentheses. Working Sample: AHEAD and overlap cohort with answer to subjective nursing home probability within next 5 years in wave 2. Initial sample includes only those with non-missing observations of nursing home entry in the following wave. Entry 1 wave later is defined as having been or still being in a nursing home since the last wave.*

Table 3b: Mean Subjective Nursing Home Probabilities by Currently Living in One

	Overall Probability	Entry 1 wave later *	No Entry 1 wave later *	% with Entry 1 wave later	Cumulative Entry as % of initial sample
Wave 2 (N=6019)	13.95% (0.30)	21.26% (1.94)	13.66% (0.30)	3.80%	3.80%
Wave 3 (N=4560)	17.29% (0.36)	24.47% (1.98)	16.94% (0.37)	4.67%	8.91%
Wave 4 (N=3526)	14.92% (0.39)	23.36% (2.21)	14.45% (0.39)	5.25%	13.89%
Wave 5 (N=2924)	17.61% (0.45)	25.85% (2.25)	17.03% (0.45)	6.57%	19.46%

** The means are all statistically different at the 1% level (unequal variances permitted).*

Standard errors of the mean in parenthesis. Working Sample: AHEAD and overlap cohort with answer to subjective nursing home probability within next 5 years in wave 2. Initial sample includes only those with non-missing observations of nursing home entry in the following wave. Entry 1 wave later is defined as living in a nursing home at the time of the interview.

Table 3c: Entry Proportion by Subjective Nursing Home Probability Range Given in Previous Wave

Probability in Previous Wave	1995		1998		2000		2002	
	Measure of Entry [1]		Measure of Entry [1]		Measure of Entry [1]		Measure of Entry [1]	
	1	2	1	2	1	2	1	2
"Don't know" or "refuse"	11.09%	7.85%	14.03%	10.15%	14.83%	9.75%	17.51%	11.22%
0	5.46%	3.42%	7.28%	4.42%	8.54%	4.73%	11.02%	5.73%
1-25	4.34%	2.50%	6.95%	3.76%	7.92%	3.89%	11.33%	6.42%
26-49	5.85%	2.93%	10.80%	7.20%	6.40%	4.80%	12.00%	4.00%
50	10.06%	6.20%	10.84%	7.28%	12.50%	8.50%	15.23%	9.14%
> 50	11.78%	8.39%	14.33%	7.99%	23.60%	15.17%	21.17%	15.58%
All	6.77%	4.33%	8.70%	5.34%	10.27%	6.12%	13.06%	7.47%
N	6915	6923	5481	5482	4507	4509	3669	3680

[1] Measure 1: having been in a nursing home since the last wave; Measure 2: currently living in a nursing home at the time of the interview. See text for more detail.

Ahead and overlap cohort only. Question about nursing home probability within the next five years in wave 2 and information about the respective measure in the following wave (not cumulative).

Another interesting question is whether the proportion of actual entry differs for those who gave a high versus a low subjective probability. Table 3c shows in general a monotone relationship between the probability given and the actual percentage of entry with the systematic exception of those who gave a zero probability. Those have a higher entry probability than those who gave a probability between 1% and 25%, and sometimes even higher than those who gave a probability between 25% and 50%. Interestingly, those who answered "don't know" or "refuse" had a proportion of entry as high (or higher) as those who gave a probability above 49%, suggesting that item-nonresponse is not random.

Table 3d: Subjective Nursing Home Probabilities by Probability Range in 1993 Versus Cumulative Entry 2 waves later

		Cumulative entry as % of initial sample	
Measure of Entry [1]		**1**	**2**
Overall Probability in 1993		14.53% (0.004)	10.02% (0.004)
Range	**N**		
0	**3813**	11.28% (0.005)	7.58% (0.004)
1-25	**1261**	10.55% (0.009)	7.06% (0.007)
26-49	**217**	16.13% (0.025)	10.14% (0.021)
50	**753**	20.32% (0.015)	14.08% (0.013)
51-100	**318**	25.47% (0.024)	18.55% (0.022)
Don't know/ Refuse	**1000**	23.80% (0.013)	17.30% (0.012)

[1] Measure 1: having been in a nursing home since the last wave; Measure 2: currently living in nursing home at the time of the interview. See text for more detail.

Standard errors of the mean in parentheses. AHEAD and overlap cohort with answer to subjective nursing home probability within next 5 years *in wave 2 and information about the respective measure in any of the two following waves only. N=7362.*

Table 3d shows cumulative entry for the five years between 1993 and 1998 by the range of nursing home probability given in 1993. For both measures, the cumulative probability is higher for those who were in a higher range with the exception of those who gave a zero probability, and as in the previous table, those who answered "don't know" or "refuse" had a higher cumulative entry probability than those in lower ranges.

Table 4: Probit Regressions for Nursing Home Entry within 5 Years (average marginal effects)

	(1)	(2)	(3)	(4)
Cumulative Entry Measure [1]	**1**	**2**	**1**	**2**
NH expectation				
Continuous	0.001 (0.000)***	0.001 (0.000)***		
1-25			0.001 (0.023)	0.003 (0.021)
26-49			0.024 (0.031)	0.032 (0.029)
50			0.061 (0.024)**	0.046 (0.022)**
51-100			0.130 (0.035)***	0.080 (0.031)***
Don't know / refuse			0.076 (0.021)***	0.057 (0.019)***
Bad Health	0.076 (0.017)***	0.036 (0.014)**	0.072 (0.016)***	0.036 (0.014)***
Black	-0.047 (0.020)**	-0.037 (0.017)**	-0.052 (0.018)***	-0.037 (0.016)**
# of Observations	2640	2643	3182	3185

[1] Measure 1: having been in a nursing home 1993 and 1998; Measure 2: currently living in nursing home while interviewed in 1995 or 1998. See text for more detail.

*Only AHEAD and overlap cohorts, singles only. All independent variables in 1993. Robust standard errors in parentheses. *** p<0.01, ** p<0.05. Other covariates included (marginal effects not shown): gender, educational dummies, race other, log of total wealth, ADL and ADL squared, IADL and IADL squared, number of living siblings, number of living children. The number of observations for the two measures differs because there were 3 observations were a missing number of children or siblings predicted failure perfectly. Please see Table A2 in the appendix for the entire set of coefficients. Excluding observations with a 50% probability did not change the results.*

Multivariate analysis shows the predictive power of subjective probabilities controlling for other factors influencing nursing home entry. Table 4 shows the result of probit estimations of cumulative nursing home entry after five years for the first wave of single AHEAD respondents in 1993 (see Table A1 in the appendix for summary statistics for the sample). Table 4 shows the average marginal effects of four regressions, two for each measure of nursing home entry: one with a continuous measure of nursing home probability, and one using ranges, including a dummy for "don't know" and "refuse" (see Table A1 in the appendix for the complete set of estimated coefficients). We can see that even after taking into account the other variables that affect nursing home entry, the continuously measured nursing home expectation has a small but statistically significant effect on actual entry. The other covariates have the expected effects, with the health variables being the most important predictors for nursing home entry. The smallness of the effects of the nursing home expectations is not particularly surprising, since it has been found that answers to expectations questions exhibit a significant amount of unobserved heterogeneity, such as optimism, of the respondents (Bassett and Lumsdaine 2001, Kézdi and Willis 2003).

The average marginal effects of dummies for different expectation ranges show a remarkable difference. As compared to those who gave an expected probability of zero, those in the ranges under 50% had no statistically significant effects. Those who gave a probability of 50%, however, and those who gave a higher probability or answered "don't know" or "refuse", had a statistically and economically significant effect: somebody who gave a probability of over 50%, for example, had an 8% higher probability of having been in a nursing home within five years. As before, the coefficients of those who refused to answer or answered "don't know" lie between those who gave an answer of 50 and those who gave a higher probability.

A random-effects probit analysis, taking advantage of the panel aspect of the data, shows a strong consistency of the size of the coefficients for different specifications of actual entry. Table 5a shows the coefficients of random-effects probit estimations of actual entry for the two measures of actual entry.

Table 5a: Random-Effects Probit Regressions for Nursing Home Entry (coefficients)

	(1)	(2)	(3)	(4)
Measure of Entry [1]	**1**	**1**	**2**	**2**
NH expectation				
Continuous	0.005 (0.001)***		0.005 (0.001)***	
1-25		0.030 (0.087)		0.053 (0.095)
26-49		-0.045 (0.167)		-0.024 (0.196)
50		0.163 (0.089)*		0.092 (0.101)
51-100		0.320 (0.117)***		0.433 (0.132)***
Don't know / refuse		0.219 (0.085)***		0.396 (0.095)***
Log of total wealth	-0.025 (0.009)***	-0.017 (0.008)**	-0.022 (0.010)**	-0.024 (0.009)***
Bad health	0.343 (0.070)***	0.207 (0.067)***	0.344 (0.092)***	0.272 (0.079)***
IADLs	0.904 (0.156)***	0.774 (0.165)***	1.436 (0.192)***	1.266 (0.165)***
IADLs squared	-0.249 (0.073)***	-0.196 (0.082)**	-0.397 (0.083)***	-0.337 (0.072)***
ADLs	0.639 (0.080)***	0.522 (0.080)***	0.872 (0.102)***	0.809 (0.089)***
ADLs squared	-0.119 (0.021)***	-0.086 (0.022)***	-0.166 (0.026)***	-0.147 (0.022)***
# of living children	-0.187 (0.023)***	-0.164 (0.030)***	-0.217 (0.028)***	-0.216 (0.026)***
# of living siblings	-0.179 (0.024)***	-0.222 (0.051)***	-0.199 (0.029)***	-0.192 (0.026)***
Constant	-1.064 (0.125)***	-1.123 (0.150)***	-2.099 (0.182)***	-1.904 (0.158)***
Observations	8565	9952	8575	9965
Number of hhidpn	3743	4024	3747	4028
Wald chi2	336.38	185.06	279.94	337.44

[1] Measure 1: having been in a nursing home within one or both of the two following waves; Measure 2: currently living in a nursing home in one or both of the two following waves. See text for more detail.

*Ahead and overlap cohorts, singles only. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Excluding the log of total wealth change the coefficients on nursing home expectations only minimally, as does excluding short-term stays in measure 1. Excluding answers of 50% in the continuous measure of nursing home expectations increases the coefficients by about one fifth.*

The size of the coefficients for the continuous measure of nursing home expectations is rather stable and, albeit bigger than in the case of the cross-sectional probit, still small and statistically significant. As in the cross-sectional probit, the picture changes for range dummies of the expectations. Respondents who gave a probability of 50 (only for measure 1) or above had a statistically significant higher probability of going into a nursing home than those who gave a probability of zero, as did those who responded "don't know" or "refused" to respond.

Table 5b: Random-Effects Probit Regressions for Nursing Home Entry (marginal effects)

Measure of Entry [1]	1	2
NH expectation		
1-25	0.002 (0.005)	0.0003 (0.001)
26-49	-0.002 (0.008)	-0.0001 (0.001)
50	0.009 (0.006)	0.001 (0.001)
51-100	0.021 (0.011)*	0.004 (0.002)*
Don't know / refuse	0.013 (0.006)**	0.003 (0.002)**
Bad health	0.013 (0.005)***	0.002 (0.001)**

[1] Measure 1: having been in a nursing home within one or both of the two following waves; Measure 2: currently living in nursing home while interviewed in one or both of the two following waves. See text for more detail.

*Ahead and overlap cohorts, singles only. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. For other included covariates, see Table 5a. Marginal effects shown are evaluated for the change from 0 to and are calculated assuming that the random effect is zero.*

To assess the economic significance of these estimates, Table 5b shows the marginal effects of the range dummies for nursing home expectations (the results for the continuous measure are omitted since they are extremely small). Since in the calculation of the marginal effects it is assumed that the random effect is zero, a comparison to other variables makes more sense than assessing the absolute value of the effect. Interestingly, we find that the marginal effects of nursing home expectation ranges above 50% are comparable to those of changing from excellent,

very good or good to fair or poor health. For example, with respect to the measure of living in a nursing home, the marginal effect of moving from a zero to a probability over 50% is twice as big as the marginal effect of falling into bad health.

For the case of entry three waves later, the coefficients for the continuous measures increase relative to two waves later. For the range dummies the effects are not as obvious, with in general all coefficients becoming more statistically significant, but not necessarily higher (results not shown).

We conclude from this that, in accordance with previous studies, expectations about future nursing home use are clearly related to outcomes, and include private information in addition to other observable factors. This does not exclude, however, that individuals might not use all information available in forming their expectations; Coe (2005) has found that individuals seem not to take into account the effect of some of their known characteristics, especially demographic characteristics.

Given that nursing home expectations are on average predictive for future nursing home entry, above and beyond other observables, we now turn to the question if these expectations influence savings behavior.

4 Do expectations influence savings behavior?

Not much evidence has been found that subjective expectations affect economic behavior in a significant way above and beyond other observable factors (see, for example, Hurd, Smith and Zissimopoulos 2004). Because of the evidence that these expectations have explanatory power for the actual event even when controlling for other factors, the question of why more links to behavior have not been found warrants more investigation. One possible explanation is that individuals do not act according to their expectations – or maybe the expectations have a too small effect to be detectable in the data.

We are interested in the effect of the expectation of moving to a nursing home on savings behavior. Given the high cost of a nursing home stay, one would expect that the nursing home expectations influence savings behavior. This effect might be different for individuals expecting to be eligible for Medicaid or to be close to

eligibility and those who do not, and differ depending on when in the future individuals expect to go into the nursing home.

For a better understanding of this issue, a short overview over the eligibility criteria for Medicaid is necessary at this point. Medicaid finances nursing home stays for about 2/3 of all admitted: 1/3 are eligible for Medicaid upon admission, another 1/3 receive Medicaid for the part of care whose costs exceed their income after depleting their assets paying for their nursing home stay (AARP 2005). As mentioned earlier, eligibility for Medicaid depends both on income and assets.[16] States have individual rules for eligibility, which are subject to certain federal minimum criteria. In most states, individuals who qualify for Supplementary Social Security Income (SSI) also qualify for Medicaid. In 2005, the federal SSI limits for individuals were $579 per month in countable income and maximal $2,000 in countable assets. If individuals have more income than this, but not sufficient to cover the nursing home cost, they usually still qualify for Medicaid long-term care services, but have to contribute almost all their income to cover as much of the costs as possible. States are required to protect spouses from losing their income and assets due to a spouse's nursing home stay. Such a spouse is allowed to retain an income of $1,515 per month and countable assets of the greater of $19,020 or half of the couple's joint assets up to $95,100, and the state may allow the spouse to retain up to $2,378 per month (numbers as of 2004). Of special importance is the definition of countable assets – these exclude housing, that is, the principal place of residence, independent of its value, and income-producing real estate. Asset transfers made in the three-year period before applying for Medicaid results in a penalty period during which Medicaid does not cover nursing home costs.

Means-tested benefit programs have been found to have a negative effect on savings (Powers 1998; Gruber and Yelowitz 1999; Hubbard, Skinner, and Zeldes 1995). One would expect the same effect from the Medicaid eligibility rules for those eligible or close to eligibility, in order to avoid the spending down of assets while in the nursing home before becoming eligible for Medicaid. Individuals can spend money not only on consumption, but also on assets that for Medicaid purposes are non-countable, for example, to payoff mortgages, or to invest in home improvements

[16] Individuals must also meet the functional eligibility criteria, that is, they must be considered in need of a nursing home stay. These criteria vary by state (AARP 2005).

or a new car. But the effects can also be the opposite if the elderly have welfare aversion. Norton (1995) finds evidence that elderly actually receive transfers in order to avoid Medicaid eligibility rather than spending down their assets to speed up eligibility. Contrary to that, Bassett (2004) finds that an increased expectation of going into a nursing home is positively related to increased, albeit small transfers from the elderly to their children. Lee, Kim, and Tannenbaum (2006) find that a small percentage of Medicaid recipients transferred wealth to family members before becoming eligible, but as in the former case, that the amounts transferred were small. In addition, in the data used for these studies, the reasons for the transfers are not known. Especially given the small amounts involved, it is difficult if not impossible to identify if the transfers were made to spend down assets to become eligible for Medicaid, or if they were gifts from parents to children, such as for engagements, a new baby, or other special occasions or needs.

For those individuals who expect to pay for the costs of the stay themselves, one might expect increased savings in order to prepare for this event and to buy better services, such as a private room, while in the nursing home. There is also some evidence that people think that individuals covered by Medicaid receive less-quality care (Curry, Gruman, and Robison 2001). In addition, to avoid going to a nursing home individuals might save in order to be able to afford in-home nursing care or custodial care. This might also hold for individuals with lower income and/ or wealth, but should be less pronounced since these services are expensive and would require an amount of assets above the means of those in the lowest income and wealth quartile(s).

Lindrooth, Hoerger, and Norton (2000), using the first two waves of AHEAD, find that the expectations about nursing home entry in the next five years were close to the actual probability. They do not, however, find a difference of entry expectations for the lowest asset quartile, which led the authors to conclude that Medicaid subsidies may have little effect on these expectations.

The time of the expected entry could also be an important determinant of behavior, since individuals are able to change their portfolio in order to avoid paying for nursing homes themselves if this happens before the three-year period for asset transfers takes effect.

If individuals expect to leave the nursing home after a period of time, there is also an incentive to annuitize wealth in order to solely fall under the income criterion and pay part of their income for nursing home care rather than spending down their wealth. Another possibility, as mentioned earlier, is to transfer wealth from countable to non-countable assets, such as housing, for example by paying down the mortgage or increasing the value of the house through renovation. These changes could have taken place much earlier in life than when we observe the individuals. We conduct our analysis, therefore, also only on individuals who had a change in subjective nursing home probability between surveys, and consider only changes in non-housing wealth. We restrict our analysis to individuals who are singles to avoid confounding effects from couples and of changes in marital status.

Since the impact of expectations on savings should depend on non-housing wealth, it is interesting to see how the two interact.[17] Table 6a shows non-housing wealth and savings by (non-housing) wealth quartile. Median wealth is low for all but the highest quartile. Expressed differently, assuming average cost of $60,000 for an annual stay in a nursing home, median non-housing wealth for all but the highest quartile would not be sufficient to cover a one-year stay.

Table 6a: Non-housing Wealth and Savings* by Wealth Quartiles for Singles in 2000

		Wealth Quartile			
	Overall	**1**	**2**	**3**	**4**
Mean Wealth	135,103 (11,124)	-2,408 (246)	4,772 (99)	42,963 (642)	479,643 (41,795)
Median Wealth	14,595	0	4,170	37,530	257,501
Mean Savings	-12,841 (9,433)	7,028 (1,318)	13,907 (2,792)	27,952 (5,446)	-97,377 (36,019)
Median Savings	-104	51	-322	-4,891	-67,637

** Measured as difference in non-housing wealth between 2002 and 2000 for singles in both years. In 2002 US dollars.*

Standard errors of the mean in parenthesis. N = 5250.

[17] Since the primary residence is non-countable for Medicaid eligibility purposes, we only consider non-housing wealth. Housing wealth in general is an important part of wealth, although even if the value of housing is included, wealth levels are still low for all but the highest quartile(s). For example, median wealth in 2000 including housing was $66,000, and of the third wealth quartile was $194,000 (all in 2002 US dollars).

Some of the savings in the HRS could be the result of an unexpected increase in the stock market returns. We will, therefore, do sensitivity analyses on our definition of wealth. Table 6b shows, equivalent to Table 6a, non-housing wealth and savings, but this time also excluding assets invested in stocks, mutual funds, investment trusts and in individual retirement accounts. Median wealth decreases by about a third, and the excluded assets are, as is to be expected, more important for those individuals with higher wealth.

Table 6b: Non-Housing, Non-Stock and Non-IRA Wealth and Savings by Wealth Quartiles for Singles in 2000*

		Wealth Quartile			
	Overall	**1**	**2**	**3**	**4**
Mean Wealth	75,334 (4,963)	-2,924 (274)	3,332 (67)	22,681 (294)	271,377 (18,393)
Median Wealth	9,383	0	2,658	20,850	126,144
Mean Savings	1,736 (7,142)	7,692 (1,348)	14,663 (2,706)	20,849 (2,837)	-35,624 (27,623)
Median Savings	0	100	-70	-2,192	-37,123

** Measured as difference in non-housing, non-stock, non-mutual funds and investment trusts and non-IRA wealth between 2002 and 2000 for singles in both years. In 2002 US dollars. Standard errors of the mean in parenthesis. N = 5250.*

Table 7 shows, analog to Table 2, how single respondents' subjective probabilities changed between waves 4 and 5. The percentages are close to those in the entire working sample. Over half of the respondents did not change their reported nursing home expectation. Note that this does not necessarily mean that the respondents did not change their expectations. Between the two waves, two years have passed. Given that the probability of nursing home entry increases with age, and assuming that the respondents take this into account when answering the question, an unchanged expectation actually denotes a slightly lower expectation than before. This effect is mitigated, however, by the rounding of probabilities. Table 7 also shows the median savings rates by change in nursing home probabilities, which are negative at the median for all groups.

Table 7: Comparison of Subjective Probabilities of Moving to a Nursing Home in the next 5 Years (Wave 4 and Wave 5) – singles

Probability Comparison	% of total respondents	Median Savings Rate[1]	Median Savings Rate[2]
Wave 4 > Wave 5	19.47 %	- 22.45%	- 27.34%
Wave 4 < Wave 5	29.09 %	- 8.78%	- 13.42%
Wave 4 = Wave 5	51.44 %	- 16.10%	- 21.47%
N	2,555	2,075	2,071

[1]*Non-housing savings.* [2]*Non-housing, non-stocks and non-IRA savings.*
Includes only single respondents who answered the question in both interviews.

To estimate the effect of nursing home expectations on savings behavior, we have to deal with two issues, measurement error in wealth and sample selection through death and nursing home entry. To deal with the first issue, we measure savings as the difference of the logs of non-housing wealth, thus estimating savings rates rather than savings. Specifically, we measure savings as the difference in logs of wealth, where $\log(w) = \begin{cases} \log(wealth+1) \ \ if \ \ wealth \geq 0 \\ -\log(1-wealth) \ \ if \ \ wealth < 0 \end{cases}$ and

$savings_t = \log(w)_{t+1} - \log(w)_t$.

Sample selection is quite important in our data because of the age structure of the respondents. Between 4% and 6.5% of respondents in our working sample pass away from one wave to the next, while another 1% to 3% move to a nursing home. Since we are interested in savings behavior before the event, we consider individuals who went into a nursing home as sample exits. This results in our pooled data in 16% of observations as having missing savings outcomes because of selection. To correct for this sample selection through deaths and nursing home entry, we estimate the following Heckman selection model:

$savings_i = \alpha_i + \beta' NH \text{ expectation}_i + \lambda' x_i + \varepsilon_{1i}$, where savings are only observed if $\gamma z_i + \varepsilon_{2i} > 0$, $\varepsilon_1 \sim N(0,\sigma)$, $\varepsilon_2 \sim N(0,1)$, and $corr(\varepsilon_1, \varepsilon_2) = \rho$.

Included in the outcome equation are a variety of covariates known to influence savings (see Table 8 for a description). We include permanent income as a proxy for socio-economic status, which we get as follows: We estimate a simple OLS model in which (real) income is regressed on age, age squared, marital status, and

gender, an interactive dummy of marital status and gender, race/ethnicity, education, and retirement status. Then, predicted values based on the regression coefficients serve as a proxy variable for permanent income (Ballah, 1980). Because of the endogeneity of the bequest motive we use the number of living children as a proxy (Hurd, 1987).

Table 8: Description of Variables Used in Pooled Savings Regression

Variable	Explanation	Mean	Min / Max
NH Exp	Subjective Nursing Home Expectation (in %)	16.51	0 / 100
Log(wealth)	Log of non-housing wealth in US-$2002	9.18	-11.76 / 17.66
Income	Permanent income as proxy for SES in US$1,000 2002 (see text for derivation)	20.96	-39.40 / 79.28
Age	Age in years	77.26	65 / 105
Female	= 0 if male, = 1 if female	0.78	0 / 1
Black	= 1 if black	0.13	0 / 1
Race other	= 1 if neither black nor white	0.02	0 / 1
HS	= 1 if finished high school or GED	0.36	0 / 1
Some College	= 1 if both more than 12 years of schooling and high school or GED diploma	0.31	0 / 1
Medicaid	= 1 if on Medicaid	0.09	0 / 1
Medicare	= 1 if on Medicare or VA/ Champus	0.97	0 / 1
LTC	= 1 if has long-term care insurance	0.08	0 / 1
# of Children	Number of living children	2.64	0 / 20
OOP H Exp	Out-of-pocket health expenditures in 1,000 US $ 2002	2.45	0 / 132.12
Worse Health	= 1 if worse health compared to last interview	0.27	0 / 1
Bad Health	= 1 if self-reported health fair or poor	0.33	0 / 1
Home Care	= 1 if receives home health care	0.13	0 / 1
# of IADL's	Number of impairments of instrumental activities of daily living (0 – 3)	0.11	0 / 3
# of Siblings	Number of living siblings	1.98	0 / 15
# of ADL's	Number of impairments of activities of daily living (0-5)	0.40	0 / 5

N=7,766, except for NH Exp (7,553) and Log(wealth) (7,727).

The selection equation includes variables influencing the likelihood of going into a nursing home and dying. We include the number of restrictions of activities of daily living (ADL's) and its square in this equation, as well as the number of living

siblings, and exclude these variables in the outcome equation, therefore assuming these variables to be unrelated to the savings outcome. The number of IADL's is a good predictor for sample exit. Its unrelatedness to savings behavior is a reasonable assumption, given that we control for the relevant health measures in the savings equation, such as out-of-pocket medical expenses. The number of living siblings is included because it influences the probability of nursing home entry, and probably life expectancy through a genetic link. We assume that it does not influence savings behavior, since there is no evidence for a motive to bequest to siblings (see, for example, Hurd and Smith 2002). We checked for the robustness of the results to exclusion of this variable from the equation, and found no significant differences.

To check if the assumptions on the variables affecting the sample selection are reasonable, we conducted a probit analysis on the pooled sample with clustered standard errors for repeatedly observed respondents. In the full sample, all variables with the exception of permanent income and the racial dummies were highly statistically significant, and the pseudo R squared was 0.13. Permanent income and racial dummies were, however, statistically significant in the wealth group subsamples.

The full sample used for these estimations of savings is more restricted than before. As mentioned earlier in this section, we only consider respondents who were single in two consecutive waves. In addition to the sample selection for the first part, we exclude wave 2 from AHEAD (1993) from our estimation since there are substantial measurement errors in wealth for this cohort (Rohwedder et al. 2 004), and there is no information available for nursing home probabilities in wave 1. We also exclude observations with zero wealth because of our use of the savings rate as outcome. Furthermore, we exclude all observations with missing permanent income, and those where it was unknown if the respondent was alive or not. This leaves 7,766 pooled observations, out of which 1225 (16%) have unobserved savings because of sample exit through death or nursing home entry. Since we expect the effects to differ depending on wealth, we run a regression for the full sample and separate regressions for those with negative wealth and for the four wealth quartiles for positive wealth.[18]

[18] Potential endogeneity of wealth is mitigated by the fact that wealth is mostly the result of savings during the work life, rather than during old-age.

Table 9a shows the resulting coefficients, and Table 9b selected marginal effects. Note that the selection equation estimates the outcome of staying in the sample.

Table 9a: Heckman Sample Selection Model for Savings (pooled data): Coefficients [1]

	(1)	(2)	(3)	(4)	(5)	(6)
Wealth	**All**	**Negative**	**Positive Quartiles**			
			1.	**2.**	**3.**	**4.**
NH Exp	0.004**	0.006	-0.002	0.010***	-0.000	0.001
	(0.002)	(0.016)	(0.004)	(0.004)	(0.003)	(0.001)
Log(wealth)	-0.717***	-0.639**	-0.527***	-0.216	-0.024	-0.229***
	(0.015)	(0.274)	(0.078)	(0.146)	(0.149)	(0.043)
Income	0.012**	-0.001	0.006	0.005	0.003	0.007
	(0.006)	(0.027)	(0.014)	(0.011)	(0.007)	(0.006)
Age	0.088***	0.046	0.169***	0.062***	-0.003	0.031***
	(0.010)	(0.071)	(0.025)	(0.022)	(0.010)	(0.008)
Female	-0.933***	-0.702	-0.859*	-0.741***	-0.270**	-0.161
	(0.144)	(1.241)	(0.455)	(0.277)	(0.136)	(0.132)
Black	-2.098***	-1.805*	-1.547***	-1.217***	-1.044**	-0.951**
	(0.252)	(0.946)	(0.485)	(0.424)	(0.411)	(0.472)
Race other	-2.181***	-2.262	-1.991*	-0.817	-1.068	-3.070**
	(0.562)	(1.857)	(1.085)	(0.848)	(1.051)	(1.449)
HS	0.771***	1.096	-0.262	0.270	0.394**	0.923***
	(0.174)	(1.041)	(0.442)	(0.316)	(0.182)	(0.201)
Some College	1.224***	0.974	-0.711	0.572**	0.514***	0.895***
	(0.144)	(1.233)	(0.503)	(0.263)	(0.172)	(0.182)
Medicaid	-1.605***	-1.258	-0.786***	-0.814**	-0.596	-1.547***
	(0.205)	(0.924)	(0.245)	(0.352)	(0.699)	(0.389)
Medicare	-0.014	-0.319	-1.254	0.586	-0.408	0.120
	(0.241)	(1.720)	(0.968)	(0.574)	(0.248)	(0.272)
LTC	0.643***	0.632	-0.182	0.545**	0.320*	0.123*
	(0.136)	(2.083)	(0.481)	(0.261)	(0.172)	(0.068)
# of children	-0.129***	0.062	-0.081	-0.059	-0.085**	-0.060***
	(0.030)	(0.150)	(0.065)	(0.069)	(0.038)	(0.023)
OOP H Exp	0.010	0.049	0.001	0.016*	0.001	-0.007
	(0.007)	(0.034)	(0.012)	(0.009)	(0.010)	(0.005)
Worse health	0.077	-1.120	-0.143	0.166	-0.117	-0.025
	(0.145)	(0.880)	(0.387)	(0.254)	(0.192)	(0.113)
Bad health	-0.229	0.136	0.106	-0.306	-0.136	0.050
	(0.141)	(0.852)	(0.364)	(0.243)	(0.158)	(0.146)
Home care	-0.101	0.048	-0.134	-0.316	-0.234	0.047
	(0.131)	(1.053)	(0.292)	(0.234)	(0.300)	(0.133)
# of IADL's	0.790***	0.829	0.919**	0.767**	-0.593	0.030
	(0.179)	(0.674)	(0.392)	(0.367)	(0.373)	(0.214)
Constant	-0.279	0.279	-6.495**	-5.731**	1.048	-0.092
	(1.407)	(6.309)	(2.717)	(2.594)	(1.871)	(0.907)

	(1)	(2)	(3)	(4)	(5)	(6)
Wealth	**All**	**Negative**	**Positive Quartiles**			
			1.	**2.**	**3.**	**4.**

Table continues on next page.

Selection Equation						
Income	-0.000	0.001	0.002	0.002	-0.009**	-0.002
	(0.002)	(0.005)	(0.003)	(0.005)	(0.004)	(0.004)
Age	-0.034***	-0.019	-0.028***	-0.028***	-0.053***	-0.037***
	(0.003)	(0.013)	(0.005)	(0.006)	(0.007)	(0.006)
Female	0.245***	0.718***	0.235***	0.323***	0.364***	0.167
	(0.042)	(0.210)	(0.085)	(0.087)	(0.095)	(0.103)
Black	0.509***	0.376*	0.268***	0.259*	0.163	0.285
	(0.076)	(0.209)	(0.097)	(0.137)	(0.209)	(0.303)
Race other	0.609***	0.113	0.318	0.150	-0.483	1.404*
	(0.217)	(0.314)	(0.210)	(0.260)	(0.398)	(0.746)
HS	0.045	0.521**	0.193**	-0.042	0.018	-0.181
	(0.049)	(0.210)	(0.087)	(0.102)	(0.118)	(0.134)
Some college	-0.006	0.495**	0.216**	-0.049	0.091	-0.245**
	(0.040)	(0.243)	(0.094)	(0.079)	(0.094)	(0.115)
# of siblings[2]	0.010	0.035	0.016	0.020	0.065***	-0.003
	(0.007)	(0.041)	(0.011)	(0.016)	(0.023)	(0.016)
# of children	0.036***	0.044	0.028**	0.021	0.012	0.065***
	(0.009)	(0.035)	(0.013)	(0.019)	(0.023)	(0.022)
Bad health	-0.079**	-0.159	-0.095	-0.031	-0.301***	-0.213**
	(0.038)	(0.184)	(0.067)	(0.074)	(0.092)	(0.097)
Worse health	-0.065*	-0.023	0.030	-0.108	-0.228**	-0.111
	(0.038)	(0.175)	(0.072)	(0.078)	(0.090)	(0.084)
# of ADL's	-0.048	-0.508**	-0.133***	-0.100*	-0.291***	-0.111
	(0.033)	(0.200)	(0.047)	(0.057)	(0.107)	(0.068)
(# of ADL's) squared	0.000	0.131**	0.024*	0.007	0.036	0.002
	(0.008)	(0.057)	(0.013)	(0.014)	(0.031)	(0.020)
# of IADL's	-0.220***	-0.407***	-0.162**	-0.214**	-0.397***	-0.293**
	(0.041)	(0.143)	(0.067)	(0.083)	(0.083)	(0.123)
Constant	3.181***	1.753	2.434***	2.639***	5.349***	3.973***
	(0.266)	(1.099)	(0.434)	(0.597)	(0.661)	(0.620)
Observations	7766	431	1592	1752	1963	1989
Lambda	-4.272	3.184	-5.978	-4.113	0.0601	-1.565

[1] *Robust standard errors in parentheses;*** p<0.01, ** p<0.05, * p<0.1. Analysis is clustered for the individual identifiers. See text for the sample selection. Also included in the outcome equations are wave dummies and the following missing flags in the relevant outcome and selection equations (coefficients omitted): permanent income, # of children, and LTC.*

[2] *P-value =11.1%. Excluding the number of siblings in the selection equation*

changes the coefficients on nursing home probability only slightly.

For the full sample, the effect of subjective nursing home expectations on savings rates is positive and statistically significant. A 1% increase in this subjective probability increases the savings rate by 0.4%-points. Among the different wealth groups, this effect is statistically significant only in the second positive wealth quartile (between $4,500 and $30,200), where it is also positive and over twice as big.[19]

Table 9b: Heckman Sample Selection Model for Savings (pooled data): Selected Marginal effects

Wealth Range	**All**	**2. positive Quartile**
	-128,000 – 46,600,000	$4,587 - $30,200
NH Exp.	0.004**	0.010***
Log(wealth)	-0.717***	-0.216
Age	0.027***	0.014
Female (*)	-0.474***	-.137
Black (*)	-1.307***	-0.791**
HS (*)	0.851 ***	0.196
Some college (*)	1.245***	0.486**
Bad health*	-0.372***	-0.361**
N	7766	1752

(*) is the marginal effect of a discrete change of a dummy variable from 0 to 1.

**** p<0.01, ** p<0.05, * p<0.1. Marginal effects shown are for the expected value of the dependent variable conditional on being observed.*

These results are robust to restricting the sample to only those with non-missing information on the number of living children. If we further restrict our sample to those who have changed their nursing home probability since the last wave, we find a slightly stronger and more precise effect of nursing home expectations for the full sample, and a much stronger effect for the second positive wealth quartile (with a p-value of under 1%). For this subgroup, a 1% increase in nursing home

[19] We could not split the sample up further because of the low sample sizes.

expectation increases the savings rate by 1.8%-points. In addition, the lowest positive wealth quartile has now a borderline statistically significant positive effect of nursing home expectations. For this subgroup, a 1% increase in nursing home probability decreases the savings rate by 1.0%-point, with a p-value of 11.6%.

Changing the savings measures to exclude wealth in stocks, mutual funds, investment trusts, and individual retirement accounts, renders the estimated effects for the full sample slightly smaller, and not statistically significant for all wealth subgroups.[20]

In the case of the subsample of those with changed nursing home expectations and non-missing information on the number of living children, the marginal effect for the full sample is slightly higher. The first positive wealth quartile has a statistically significant marginal effect of 0.010 (p-value 9.0%). There is no statistically significant effect for the second positive wealth quartile.

The results for the full sample are robust to an exclusion of those who gave an answer of 50 to the nursing home expectation question. [21] These results are also robust to an exclusion of savings outliers (above and below $1,000,000). If we just use the first two available waves to reduce the bias from sample selection as much as possible and conduct a simple OLS regression, we find similar results with slightly higher coefficients.[22]

The results are also robust to an inclusion of housing wealth in the savings measure, just slightly increasing the coefficient for the full sample, and decreasing the coefficient for the second positive wealth group. This points to individuals responding to their nursing home expectations in a balanced manner, that is, by not

[20] This does not take into account (potentially endogenous) portfolio reallocation, and should, therefore, not be interpreted as more than a robustness check on the savings measure.

[21] The sample size was not big enough to check what happens if we split the sample into wealth groups.

[22] The upward bias is not necessarily expected, since individuals who drop out of the sample are in worse health and, one would expect in conjunction with this, have lower wealth and socio-economic status, which are all related to higher probabilities of going into a nursing home. On the other hand, if higher socio-economic status is related to a closer link between expectations and behavior, the upward bias could be a result from the overrepresentation of these types of respondents in the sample.

increasing their savings rate overwhelmingly in (Medicaid eligibility exempted) housing.[23]

As for other covariates, we find that individuals with higher wealth have lower savings rates, as do non-whites and individuals with a higher number of living children and individuals in bad health. Savings rates increase in age, educational level, and permanent income. Surprisingly, women have lower savings rates; an effect that (for the samples not split by wealth groups) is as big as the effect of being in bad health. The higher likelihood of blacks to stay in the sample (as can be seen by the positive coefficient estimated in the selection equation) can be explained both by the lower likelihood for blacks to go to a nursing home and the selection effect of having survived to old-age.

We conclude from these results that there is a positive relation between expectations of moving to a nursing home and savings rates, with some evidence that this relationship is especially strong for the upper lower wealth group.

The lack of difference in savings behavior by wealth group is consistent with the explanation that individuals increase their savings in order to be better prepared for the contingency of the need for long-term care either at home or in a nursing home, independent of their wealth. It is not consistent with the hypothesis that individuals dissave in order to speed up their eligibility for Medicaid.

Note that this does not imply that individuals do not dissave in order to qualify for Medicaid; it just implies that individuals do not dissave as a reaction to their own perceived probability of moving to a nursing home. Indeed, in both a simple probit and in a random-effect model, we find that the savings rate is negatively related to future Medicaid receipt.

5 Conclusions

Long-term care is an important issue facing older Americans because of the high probability of ever entering a nursing home and its high cost. In this paper, we examine individual expectations about future nursing home entry and study the relationship between these expectations and outcomes, as well as between these

[23] Housing wealth reacts strongly to a change in housing prices, and since housing wealth is much more difficult to reallocate to other assets holdings, a difference in savings rates might simply reflect changes in housing prices, rather than intentional savings.

expectations and savings behavior, using data from the US Health and Retirement Study. Our results indicate that subjective expectations are closely related to the actual probability of entry and actual future nursing home entry.

We also find a positive link between these expectations and savings behavior, and no support for the hypothesis that individuals in specific wealth groups decrease their savings rate to speed up eligibility for Medicaid. This positive effect is somewhat surprising, since one would expect that individuals know their probability well before we observe them in our data, and in response to this take action at an earlier time when it is still possible to make a big difference in wealth levels. Individuals who perceive that they need more precautionary savings might start doing so at a much younger age than when we observe them, when most individuals are about 70 years of age and live off a fixed income.

It is also somewhat unexpected that we have found no difference in savings behavior by wealth group. A possible reason for this could be that individuals in lower wealth groups have only limited information about both the cost of nursing homes and about who is paying for nursing home stays. That is, if individuals believe, for example, that Medicare pays for nursing home stays and nursing care at home, then there is no need to dissave to speed up eligibility for Medicaid. A recent survey by the AARP found that many elderly are not aware of the fact that Medicare does not pay for nursing home stays over 100 days, and even then only in limited circumstances. The Kaiser Commission on Medicaid and the Uninsured concluded in a recent report that the vast majority of people have not planned for long-term care needs, are unaware of the options, and that many people assume that Medicare provides long-term care services (Cheek and Blum 2005).

An additional reason might be a preference of many elderly to not depend on governmental aid. This is in line with the findings of Norton (1995) that the elderly actually receive transfers in order to avoid Medicaid eligibility.

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APPENDIX

Table A1: Summary Statistics

Variable	Mean	Min	Max
Cum. Entry Measure 1	0.20	0	1
Cum. Entry Measure 2	0.14	0	1
NH Exp.	15.87	0	100
Age	78.23	69	103
Female	0.79	0	1
Bad Health	0.35	0	1
Black	0.16	0	1
Race other	0.02	0	1
HS	0.30	0	1
Some College	0.26	0	1
Log(wealth)	9.50	-10.03	15.82
# of IADLs	0.13	0	3
# of ADLs	0.35	0	5
# of children	2.42	0	15
# of siblings	1.99	0	12

Statistics for sample used in regressions shown in Table 4. Measure 1: having been in a nursing home 1993 and 1998; Measure 2: currently living in nursing home while interviewed in 1995 or 1998. All measures in 1993. N = 2643, except for Cum. Entry Measure 1 (2640).

Table A2: Probit Regressions for Nursing Home Entry

Cumulative Entry Measure [1]	1	2	1	2
NH expectation				
Continuous	0.005 (0.001)***	0.004 (0.001)***		
1-25			0.019 (0.081)	0.061 (0.090)
26-49			0.111 (0.163)	0.075 (0.181)
50			0.224 (0.084)***	0.208 (0.092)**
51-100			0.445 (0.111)***	0.342 (0.118)***
Don't know / refuse			0.277 (0.073)***	0.255 (0.078)***
Age	0.063 (0.007)***	0.068 (0.008)***	0.058 (0.006)***	0.061 (0.007)***
Age squared	-0.001 (0.001)*	-0.001 (0.001)	-0.001 (0.001)**	-0.001 (0.001)
Gender	-0.074 (0.074)	-0.097 (0.082)	-0.021 (0.068)	-0.029 (0.074)
Bad health	0.301 (0.065)***	0.184 (0.072)**	0.272 (0.058)***	0.172 (0.063)***
Black	-0.196 (0.088)*	-0.195 (0.098)*	-0.201 (0.074)**	-0.177 (0.081)**
Race – other nonwhite	-0.141 (0.239)	-0.084 (0.242)	-0.358 (0.209)*	-0.360 (0.219)+
HS graduate & equiv.	0.092 (0.074)	0.094 (0.083)	0.115 (0.067)*	0.131 (0.074)*
Some college or more	0.053 (0.080)	0.037 (0.089)	0.055 (0.075)	0.035 (0.083)
Log of total wealth	-0.018 (0.007)***	-0.016 (0.007)**	-0.018 (0.006)***	-0.021 (0.006)***
IADLs	0.606 (0.158)***	0.769 (0.163)***	0.595 (0.134)***	0.662 (0.139)***
IADLs squared	-0.257 (0.076)***	-0.273 (0.077)***	-0.217 (0.065)***	-0.208 (0.067)***
ADLs	0.360 (0.092)***	0.390 (0.104)***	0.273 (0.078)***	0.302 (0.085)***
ADLS squared	-0.091 (0.029)***	-0.115 (0.034)***	-0.057 (0.023)**	-0.076 (0.026)***

Table continued on next page.

Cumulative Entry Measure [1]	1	2	1	2
# of living children	-0.050 (0.016)***	-0.053 (0.017)***	-0.058 (0.014)***	-0.056 (0.015)***
# of living siblings	-0.036 (0.017)**	-0.026 (0.019)	-0.020 (0.015)	-0.007 (0.016)
# of living children missing flag [2]			0.052 (0.750)	0.170 (0.772)
Constant	-5.703 (0.540)***	-6.328 (0.629)***	-5.353 (0.486)***	-5.811 (0.554)***
Observations	2640	2643	3182	3185
Wald chi2	296.44	283.66	366.38	348.22

[1] Measure 1: having been in a nursing home 1993 and 1998; Measure 2: currently living in a nursing home while interviewed in 1995 or 1998. See text for more detail.

[2] Number of missing observations on number of living children: 3. Excluding those does not change the results.

*Only AHEAD and overlap cohorts, singles only. All independent variables in 1993*** p<0.01, ** p<0.05, * p<0.1. Robust standard errors in parentheses.*

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