TIAA Institute

Research Dialogue | Issue no. 189
July 2022

Racial and ethnic differences in longevity perceptions and implications for financial decision-making

Abstract

Inaccurate perceptions regarding life expectancy can lead to suboptimal financial decisions with long-term consequences, including undersaving prior to retirement, and overspending during retirement. As prior research suggests that Covid-19 mortality has disproportionately harmed those with low incomes, African Americans, and Hispanics in the United States, we seek to determine whether subjective survival perceptions among these groups changed in a manner consistent with observed outcomes. We fielded two online experimental surveys of US residents: one took place early in the pandemic outbreak, and the second, a year later. Using vignettes, we examine whether minorities' perceptions regarding longevity at the outbreak were consistent with observed reality, and how these compared to members of the white majority population. Furthermore, the panel aspect of our study enables us to test whether and how these perceptions updated over time during the pandemic. Finally, we show how these perceptions related to advice regarding retirement saving and drawdowns.

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The Covid-19 shock offers researchers with an unusual opportunity to explore how people's beliefs about subjective survival changed during a major unexpected health shock, and how in turn these influenced household financial decision-making. This paper uses data collected using an online panel survey that we administered at the start of the pandemic in 2020 and a year later, in 2021. This permits us to compare people's subjective assessments of their own survival chances with those from population life tables. We also elicited from respondents their expectations of how overall population survival rates would change in light of the global health shock. Finally, we show how people's subjective survival rates shaped key aspects of their declared financial decision-making pertinent to retirement well-being.

Even prior to the pandemic, a substantial empirical literature had reported large racial disparities in life expectancy in the US. Specifically, for both men and women, life expectancy at birth is higher among Whites compared to non-Hispanic Blacks (Satcher et al., 2000; Franks et al., 2006, Levine and Crimmins, 2014; Harper et al., 2021). Also, Asian-Americans outlive Whites substantially (Acciai et al., 2015; Hahn and Eberhardt, 1995). Other studies had pointed out that, although the Black-White gap in life expectancy closed substantially (by about half) between 1990 and 2018, it was still about 3.6 years prior to the onset of the Covid-19 pandemic (Schwandt et al., 2021). Some prior studies have also examined racial differences in subjective survival probabilities. For instance, Sun and Webb (2011) showed that race was significantly correlated with being unable to assess survival probabilities. One of the most interesting findings in this context is that African Americans expect to live longer than do Whites, despite the fact that their actual life expectancy is lower (Roebuck Bulanda et al., 2009; Hurd and McGarry, 1995; Irby-Shasanmi, 2013; Mirowsky, 1999; Palloni and Novak, 2016). Other anomalies are described with respect to Mexican Americans who tend to underestimate their longevity (Roebuck Bulanda et al., 2009).

Research tracking actual differences in mortality risk between Whites and minority groups proliferated with the onset of the Covid-19 pandemic. Empirical findings point to a decline in the US life expectancy for the total population (Marois et al., 2020; Andrasfay and Goldman, 2021). There is also substantial evidence pointing to disproportionately higher infection and mortality rates from the virus among the African American (Doumas et al., 2020; Hewa, 2020; Bianchi et al., 2021) and Hispanic populations (Macias et al, 2020; Alcendor, 2020). This in turn, has been predicted to cut life expectancy by 2 to 4 times more for African Americans and Hispanics compared to the White population (Andrasfay and Goldman, 2021; Tai et al., 2021).

Nevertheless, much less attention has been devoted to analyzing how the pandemic changed people's subjective perceptions of their own and others' survival expectations. These subjective assessments are important: for instance, McGarry (2020) showed that people take into account their own characteristics known to affect survival outcomes (e.g., sex, health, own health habits, and parents' longevity), and these beliefs are correlated with financial decision-making. Relatedly, Bloom et al. (2007) reported that survey respondents who believed they would live longer than average also saved more, while Hurd and Smith (2004) documented that people having very low subjective probabilities of survival retired earlier and claimed their Social Security benefits earlier than those expecting to live longer. Nevertheless, individuals can sometimes exhibit systematic biases when predicting longevity; thus Elder (2013) and Abel et al. (2021) found that younger people overstated mortality rates, but older people understated them. Likewise, Heimer et al. (2019) concluded that survival chances were underestimated by the young and overestimated by the old, and such distortions in subjective mortality predicted undersaving among the young and oversaving for the retired. Thus far, little has been reported about how the coronavirus pandemic altered people's subjective survival probabilities and how it changed their financial decision-making patterns.

Our prior research (Hurwitz et al. 2021, 2022) focused on related questions, but there we did not explicitly explore differential outcomes in the majority White population, versus those for African Americans, Hispanics, Asian/Pacific Islanders, and others. Accordingly, here we use a panel of individuals we surveyed in early in 2020 and again a year later, in 2021 (N=2,298). This panel permits us to evaluate how respondents assessed their subjective survival probabilities early versus late in the pandemic, as well as how these changed over time. We compare these with life tables by age and sex to gauge which people over- or underestimate the changes. Moreover, we examine people's views about how overall US population survival rates changed due to Covid.

The dataset also included two experimental vignettes which we use to measure the relationship between respondents' self-assessed vulnerability to the virus and

their recommendations to others regarding how much to save and annuitize. In addition, to boost respondents' awareness of the risk of living a very long time, we tested alternative ways to frame survival probabilities, such that one group was randomly given information on life expectancy, and another received information on the tail risk associated with longevity. This experimental approach permits us to evaluate which presentation influenced people's understanding of their chances of living a very long time, how they advised others on saving and annuitization, and how these patterns differ by race and ethnicity.

In what follows, we pose four questions:

Q1. Do members of different race/ethnic groups differ from Whites, with regard to their own subjective survival probabilities and estimates of overall population survival chances?

Q2. How did people's subjective survival probabilities change from 2020 to 2021, a year into the pandemic, and did these differ for Whites, African Americans, Hispanics, Asians/Pacific Islanders, and others?

Q3. Were subjective survival probabilities differentially altered when respondents received either longevity or life expectancy information, and were they influenced by being shown vignettes where they had to recommend saving and annuitization behavior to hypothetical individuals?

Q4. Did recommendations regarding saving and annuitization behavior differ systematically between Whites, African Americans, Hispanics, Asians/Pacific Islanders, and others, after controlling on other factors?

Data and methodology

In March/June of 2020, we designed and fielded an online survey using Prolific, the internet-based crowd-working survey platform,[1] and in Feb/April of 2021, we re-surveyed 2,298 of the same individuals. Both times, participants were paid about $3.40 for participating in the approximately 15-minute questionnaire. Respondents were between ages 35-83 at baseline with a mean age of 51; 57% were women; and 60% had at least some college. Of this sample, 81% self-reported themselves as White, 7% as African American, 4% Hispanic, 5% Asian/PI, and 3% other (see Table 1).

Table 1. Descriptive statistics, 2020-2021 panel

Variable	N	Mean	Std. Dev.
2020 SLE-LE(X)	2,008	18.40	30.44
2020 SLE-LE(X-5)	2,037	3.47	30.03
2021 SLE-LE(X)	1,954	15.70	29.23
2021 SLE-LE(X-5)	1,970	1.07	29.15
ΔSLE-LE(X)	1,817	-2.58	25.57
ΔSLE-LE(X-5)	1,842	-1.98	24.21
PopLongPlus	2,077	-0.39	1.11
PopLELongPlus	2,103	-0.21	0.98
Hispanic	2,298	0.04	0.20
African American	2,298	0.07	0.25
Asian/PacI	2,298	0.05	0.21
Others, race	2,298	0.03	0.16

Source: Authors' calculations, see text and Online Appendix Table 1.

1 Prolific (www.prolific.ac) is an online survey platform managed by Oxford University. It reports several demographic variables about participants allowing researchers to screen for respondents with particular characteristics (e.g., age, sex, country of residence). It has been judged to be transparent, extremely useable, and highly valuable to researchers due to the sample diversity and the rate of honest answers compared to MTurk, a commonly used platform.

Additional data about respondents' socioeconomic backgrounds was also gathered, including marital status, self-reported health, income, number of persons living in the household, present preferences, financial literacy and numeracy scores (variable definitions appear in Online Appendix Table 1). In addition, we asked participants *What is the percent chance [0-100] that you think you will live at least {X} more years?* where the target age varied by the respondent's sex and age (Online Appendix Table 2 reports additional detail). We also asked participants about their chance of living to an age five years younger *{X-5}* than in the previous question. We then compare respondents' reported survival chances to age *X (X-5)* to their age/sex values from a population life table.[2] A respondent was deemed an "overestimator" if his subjected chance of living to *X (X-5)* exceeded that from the life tables, i.e., if *SLE-LE(X)* or *(X-5)* was positive. Since we posed these questions in both 2020 and 2021, we can also compute the *change in overestimation* across the two years (*ΔSLE-LE(X)* and *(X-5)*).

Table 1 shows that, in both years, respondents overestimated their survival chances compared to the life tables, but more so to living to age *X* than to age *X-5*.[3] Yet the change between 2020 and 2021 was negative (-2.58 and -1.98, respectively), implying that the respondents overestimated their subjective survival chances less after a year of pandemic (and taking into account the fact that they were a year older). In addition, we asked subjects to evaluate their chances of dying from Covid; 9% indicated that they felt their chances were 50% or greater in 2020, falling to 7% by 2021. We also find that. on average, people expected a drop in the fraction of the US population likely to attain age 90 due to Covid (*PopLongPlus*), as well as a decline in the US population's life expectancy due to Covid after getting vaccinated (*PopLELongPlus*).

Comparative results on subjective survival probabilities by race/ethnicity

Table 2 compares mean values of subjective survival probabilities and related variables for White, Hispanics, African Americans, Asian/Pacific Islanders, and others, accompanied by t-tests of the difference of each variable mean from the equivalent variable mean for Whites. The column labeled Hispanic reports that along only three dimensions do we see that this group differed from Whites. Specifically, Hispanics overestimated their chances of living to age *X* in 2020 as well as 2021 by more than their White counterparts, and they reduced their estimates of the population's chances of living to age 90. Nevertheless, these mean differences are significant at only the 10% level.

Table 2. Comparison of subjective survival and longevity variables by race/ethnicity

	White	Hispanic		African-American		Asian/PacI		Other	
Variable	**Mean**	**Mean**	**Diff**	**Mean**	**Diff**	**Mean**	**Diff**	**Mean**	**Diff**
2020 SLE LE(X)	16.74	22.50	*	31.36	***	28.13	***	19.02	
2020 SLE LE(X-5)	2.17	3.87		15.35	***	12.09	***	2.47	
2021 SLE LE(X)	13.56	19.80	*	34.89	***	23.54	***	20.20	*
2021 SLE LE(X-5)	-0.48	3.31		15.48	***	8.16	***	1.12	
ΔSLE LE(X)	-2.76	-4.39		1.68	*	-3.93		-0.47	
ΔSLE LE(X-5)	-2.11	-1.86		0.39		-2.85		-1.39	
PopLongPlus	-0.38	-0.59	*	-0.39		-0.31		-0.43	
PopLELongPlus	-0.21	-0.21		-0.25		-0.08		-0.31	

*** p<0.01, ** p<0.05, * p<0.1
Note: Diff refers to t-test of difference in means between the racial/ethnic group in italics and the White mean.

2 Social Security Administration cohort life tables are used to calculate the actual probability of living to each target age by age/sex/year of birth.

3 This result is consistent with the findings of Jarnebrant and Myrseth (2013) who showed that people underestimated the likelihood of reaching middle age but overestimated the likelihood of reaching a very old age.

More marked differences are evident in the results for African Americans, who were much more likely to overestimate their chances of living to age *X* as well as *X-5* in both waves of the panel; the differences are all significant at the 1% level. This is consistent with prior research cited above showing that African Americans expect to live longer than Whites. Asian/Pacific Islanders also overestimated their survival chances (though less so than the African Americans), and again the differences are significant at the 1% level. The subjective probabilities of those self-describing themselves as 'other' race/ethnicity were, by and large, similar to those of their White counterparts. It is also interesting that, despite the many significant differences in subjective survival probabilities, few of the *changes* in self-reported probabilities across 2020 and 2021 were statistically significant; similarly, people's anticipated changes in population longevity and survival due to Covid did not differ significantly by race/ethnicity.

To better understand these subjective survival patterns, we next report results (see Table 3) from multivariate analyses of subjective survival chances for the same four race/ethnicity groups compared to Whites (odd-numbered columns) alone, and then after adding a set of key controls describing respondent attributes (even-numbered columns). This vector of control variables includes *Female* =1 if respondent was female (else 0); *Coll+* =1 if the respondent had at least some college (else 0); and *Good health* =1 if self-reported health was good/very good/excellent (else 0). *FinLit* refers to the respondent's financial literacy index based on the number of correct answers to Lusardi and Mitchell's (2008, 2014) Big Three questions.[4] *Present preferences* are calculated using four questions about preferences for winning versus losing various sums of money immediately versus a year later, taken from Khwaja et al. (2007) (i.e., win $20 vs. $30, lose $20 vs. $30, win $1,000 vs. $1,500, lose $1,000 vs. $1,500). Individuals who reported they would rather win less money now and lose more money later were considered to have higher present preferences and received higher scores on a 0–4 *present bias* scale. We also included respondents' household income, along with a question asking about people's subjective chances of dying due to the Covid virus in each year.

Table 3. Factors associated with subjective survival probabilities

	2020 SLE-LE(X)		2021 SLE-LE(X)		2020 SLE-LE(X-5)		2021 SLE-LE(X-5)	
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Hispanic or Latino	5.757*	1.365	6.242*	4.198	1.703	-1.873	3.790	4.097
	(3.376)	(3.354)	(3.255)	(3.496)	(3.317)	(3.339)	(3.232)	(3.476)
African American	14.615***	10.025***	21.335***	17.771***	13.186***	10.906***	15.960***	16.304***
	(2.842)	(3.058)	(2.798)	(3.220)	(2.787)	(3.001)	(2.765)	(3.151)
Asian/Pacific Islander	11.388***	9.049***	9.981***	5.219	9.929***	8.877***	8.641***	4.384
	(3.357)	(3.375)	(3.098)	(3.350)	(3.263)	(3.300)	(3.128)	(3.353)
Ethnicity, other	2.283	4.552	6.636	14.100***	0.304	4.329	1.594	11.166**
	(4.212)	(4.164)	(4.052)	(4.424)	(4.163)	(4.121)	(4.148)	(4.539)
Mean of dep. var	18.41	17.99	15.70	15.20	3.47	3.38	1.07	0.92
Std.dev of dep. var	30.44	30.20	29.23	28.95	30.03	29.82	29.15	29.00

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Other controls include age, sex, marital status, education, good health, FinLit and numeracy score, present bias, income, # people in household, chances of dying from Covid > 50%, and paid attention; see Online Appendix Table.

4 See Online Appendix B for the Big Three financial literacy questions (Q31, 32, and 78). On average, our respondents answered 2.4 out of 3 questions correctly.

One clear finding from this table is that, even after adding the controls, African American respondents continue to overestimate their subjective survival chances compared to Whites, and the coefficient magnitudes are substantial. For instance, column 1 shows that this group believed it was 14.6 percentage points more likely than Whites to live to age *X* than the life tables, and 13.2 percentage points to live to age *X-5* in column 5. Moreover, with the other controls, the coefficient estimates are large and statistically significant, at (respectively) 11.3 and 12.3 percentage points, or 63% and 117% higher than the overall means. A similar pattern is evident in the 2021 survey, where African Americans deemed themselves 12.3 and 8.6 percentage points more likely to survive to ages *X* and *X-5*, compared to Whites. This result is consistent with other studies (Roebuck Bulanda et al., 2009; Hurd and McGarry, 1995; Irby-Shasanmi, 2013; Mirowsky, 1999; and Palloni and Novak, 2016), underscoring that many African Americans overestimate their life expectancy. Results for Asian/Pacific Islanders are also quite large and significant in 2020. In column 1 we see that this group anticipated an 11.4 percentage point advantage for living to age *X* over the life tables compared to Whites, and in column 5, a 9.9 percentage point advantage for *X-5*. The effect size becomes smaller after the controls are added, but the average difference between subjective survival probabilities and life tables is still positive and statistically significant, for an 8.7 and 8.6 percentage point advantage over Whites. In 2021, the subjective-objective life expectancy gap for Asian/Pacific Islander group remained higher than for Whites, although the coefficients in columns 4 and 8 are not statistically different. These findings could result from the actual higher life expectancy of Asian Americans, who outlive White by an average of 8 years (Acciai et al., 2015, Hahn and Eberhardt, 1995). Findings regarding survival optimism for Hispanics and Other groups are all positive *vis a vis* Whites, but for the most part, less statistically significant in both years.[5]

Factors associated with changes in subjective survival optimism during the pandemic

To further elucidate what factors were associated with changes in subjective survival optimism between 2020 and 2021, we undertake multivariate analyses of the panel dataset with results reported in Table 4. Here columns 1 and 3 examine how *ΔSLE-LE(X)* and *(X-5)* changed using controls drawn from the panel, while columns 2 and 4 control for sample selection due to nonresponse to the subjective survival questions using a Heckman two-step procedure.[6] Of particular interest are the race/ethnicity coefficients on indicators for Hispanic, African American, Asia/Pacific Islanders, and other; again, the reference category is White. In addition, we control on the same respondents' age, female, marital status, health, financial literacy and numeracy scores, education, income, present bias, number of people in the household, and an indicator if people thought their chances of dying from Covid were 50%+.[7]

5 A review of estimated coefficients on other control variables in these models reveals that few other factors are consistently important in accounting for subjective survival optimism (see Online Appendix 3). Unsurprisingly, respondents in good health believed themselves more likely to outlive the life tables, and those who believed they were extremely likely to die from Covid were less optimistic as well. Nevertheless, there were no significant differences for women, the better educated, married persons, the present biased, those with higher income, and those scoring higher on the financial literacy questions were neither over (nor under) optimistic. People who scored better on the numeracy questions were somewhat less likely to be overestimators.

6 Nonresponse for the *SLE-LE(X)* outcome decreases the sample by 1,471 and for *SLE-LE(X-5)* outcome by 452. Nevertheless, neither of the estimated lambdas in Table 4 is significantly different from zero.

7 All equations also control on a variable indicating whether the respondent paid attention. The full set of results is provided in Online Appendix Table 4.

Table 4. Factors associated with change in optimism re own life expectancy, 2020-2021 panel

	Change between SLE-LE(X) from 2020 to 2021		Change between SLE-LE(X-5) from 2020 to 2021	
Variables	**OLS**	**Heckman**	**OLS**	**Heckman**
Hispanic or Latino	-2.406	0.920	1.330	4.174
	(3.459)	(4.020)	(3.279)	(3.912)
African American	3.575	17.966*	2.572	14.452
	(3.426)	(9.518)	(3.197)	(9.478)
Asian or Pacific Islander	-2.257	11.072	-0.925	10.769
	(3.428)	(8.911)	(3.195)	(9.346)
Ethnicity, others	4.471	9.723*	3.336	11.375
	(4.356)	(5.428)	(4.246)	(7.382)
R2	0.01	0.01	0.01	0.01
Mean of dep. var	-3.03	-3.03	-2.40	-2.40
Std.dev of dep. var	25.52	25.52	24.24	24.24

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Other controls include age, sex, marital status, education, good health, FinLit and numeracy score, present bias, income, # people in household, chances of dying from Covid > 50%, and paid attention; see Online Appendix Table 4. Source: Authors' calculations see text.

Results show that very few of the race/ethnicity coefficients are statistically significant at conventional levels in the OLS columns. After controlling on potential sample selection using the Heckman two-step technique, only the African American coefficient is significant at the 10% level, and only for the *ΔSLE-LE(X)* outcome. Results for Hispanics are generally not significantly different from Whites, and for the other two groups, coefficients differ from zero only at a low (10%) significance level. Other factors that occasionally attain conventional significance levels include age and education, but these are relatively rare cases.

Factors associated with respondents' assessment of changes in population longevity and life expectancy

Next, we evaluate the factors associated with respondents' assessments of changes in the longevity and life expectancy in the overall US population due to the pandemic (*PopLongPlus,* and *PopLELongPlus)*. Results appear in Table 5, where we provide both OLS and Heckman sample-selection corrected coefficient estimates for the panel dataset.[8]

8 Nonresponse for the *PopLongPlus* outcome decreases the sample by 292 and for *PopLELongPlus* outcome by 214. Both estimated lambdas in Table 5 are significantly different from zero at the 10% level or better. All equations also control on a variable indicating whether the respondent paid attention.

Table 5. Factors associated with change in optimism re population longevity and life expectancy, 2020-2021 panel

	PopLongPlus		PopLELongPlus	
Variables	**OLS**	**Heckman OLS**	**OLS**	**Heckman OLS**
Hispanic	-0.243*	-0.592***	-0.036	-0.168
	(0.135)	(0.205)	(0.118)	(0.140)
African American	-0.066	0.334	-0.046	0.166
	(0.124)	(0.216)	(0.107)	(0.161)
Asian/PacI	-0.006	0.140	0.080	0.190
	(0.136)	(0.151)	(0.117)	(0.133)
Other race	-0.144	-0.106	-0.220	-0.100
	(0.176)	(0.177)	(0.154)	(0.168)
Mean of dep. var	-0.39	-0.39	-0.21	-0.21
Std.dev of dep. var	1.12	1.12	0.98	0.98

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Other controls include age, sex, marital status, education, good health, FinLit and numeracy score, present bias, income, # people in household, chances of dying from Covid > 50%, and paid attention; see Online Appendix Table 5. Source: Authors' calculations see text.

A first observation is that very few (all but one) of the race/ethnicity coefficients fall below conventional statistical significance. Only the Hispanic coefficient is statistically significant at the 1% level in the Heckman-corrected column, where the dependent variable *(PopLongPlus)* indicates subjects' assessments of the change in the fraction of the population expected to live to age 90, post-pandemic. The magnitude of that single significant coefficient is large and negative, on the order of a 35% drop, compared to the mean of outcome variable in the OLS model, and it is even larger in the Heckman-corrected column. Otherwise, there are no significant differences by race/ethnicity in *PopLongPlus,* and none at all for *PopLELongPlus*.[9]

In sum, while Hispanics overestimated less than Whites in terms of population survival chances post-pandemic, few other racial/ethnic groups differed significantly in terms of their expectations regarding population outcomes.

Framing longevity and financial decisions

Next, we examine results from the experimental treatments to which we exposed our respondents, regarding information about life expectancy and longevity. To this end, we created two 'baseline' vignettes. One was about a single man (woman) age 40, with no children, deciding whether to increase his (her) retirement savings (the **"savings vignette"**).[10] The specific wording was as follows:

Mr. Smith is a single, 40-year-old man with no children. He will retire and claim his Social Security benefits at 65. When he retires, he will have $100,000 saved for his retirement, and he will receive $1,400 in monthly Social Security benefits.

9 Full results appear in Online Appendix Table 5. Here older people were significantly more likely to overestimate both population longevity and life expectancy, as did the better educated and higher income. Women were less likely to overestimate, as were those who score higher on the financial literacy and numeracy indexes. Respondents who believed they were more likely to die from Covid did not differ significantly from others regarding population survival statistics.

10 The use of vignettes has a long history in the medical field, and they have grown increasingly popular in economics applications (Brown et al. 2021; Samek, Kapteyn, and Gray 2019). Our previous work (Hurwitz et al. 2022) used similar vignettes but did not analyze results by race/ethnicity as we do here.

Please indicate which one of these options you would recommend:

1. *Maintain his current saving level.*
2. *Slightly increase his long-term savings by spending less.*
3. *Significantly increase his long-term savings by spending less.*
4. *Don't know.*

The other was about a single man (woman) age 60, with no children, needing to decide how to withdraw his (her) retirement savings (the **"annuitization vignette"**):

Next, we will describe a financial decision facing Mr. Smith and then we will ask you what you would recommend to this person: Mr. Smith is a single, 60-year-old man with no children. He will retire and claim his Social Security benefits at 65. When he retires, he will have $100,000 saved for his retirement, and he will receive $1,400 in monthly Social Security benefits. Imagine that Mr. Smith asks you about how to manage his $100,000 retirement savings.

Please indicate which one of the two options you would recommend:

1. *Withdraw the entire $100,000 all at once from the retirement account, to use as he needs.*
2. *Receive a regular monthly sum of $500 (equal to $6,000 yearly) for the rest of his life.*

We also (randomly) gave half the participants additional information about ***average survival probabilities*** with the following sentence: *Please note that American men, 65 years old, will survive 18.1 more years on average.*[11] Our intention was to determine whether informing respondents of the average life expectancy changes their advice to the vignette individual. A separate form of additional information was provided to the other participants, to **draw attention to the possibility of living to a very old age** and the attendant financial risk. Specifically, this other set of participants received the following additional information regarding longevity risk: *Please note that 22.3% (33.2%) of American men (women), 65 years old, will survive to the age of 90 or more.* Moreover, to evaluate whether the information provided influenced respondents subjective survival probabilities, half were asked about their survival probabilities *before* they saw the vignette, while the other half saw the vignette first and afterwards received the additional information.

With these as controls, we next analyze whether subjective survival optimism was differentially influenced by whether the respondent received the life expectancy information (***Life expectancy intervention***$_i$) or the longevity information condition (***Longevity intervention***$_i$). We also controlled on whether the subject saw the vignette prior to being asked the subjective survival probability question (***Vignette first***), and further looked at effect for different ethnic groups. Table 6 reports the results.

11 The information provided is consistent with the population life tables used.

Table 6. Impact of information treatment on survival optimism, 2020-2021 panel

	2020 Responders		2021 Responders	
Variables	SLE-LE(X): Vignette first	SLE-LE(X): Full sample	SLE-LE(X): Vignette first	SLE-LE(X): Full sample
Hispanic	-2.707	1.329	2.742	4.128
	(6.267)	(3.350)	(6.343)	(3.490)
African American	3.536	10.203***	18.580***	18.194***
	(5.815)	(3.053)	(5.375)	(3.213)
Asian/PacI	3.993	9.226***	4.563	5.701*
	(5.935)	(3.372)	(5.320)	(3.343)
Other race	8.650	4.678	19.835***	14.342***
	(7.773)	(4.154)	(7.213)	(4.413)
Mean dependent var	15.25	17.99	12.56	15.20
SD dependent var	29.73	30.20	27.14	28.95

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Other controls include age, sex, marital status, education, good health, FinLit and numeracy score, present bias, income, # people in household, chances of dying from Covid > 50%, and paid attention; see Online Appendix Table 6. Source: Authors' calculations see text.

Here we observe that the African American subjective probabilities remain positive and statistically significant in most cases, with fewer systematic results for the three other race/ethnicity groups. The coefficient magnitudes for the African American respondents are similar to those reported in Table 3, as well, confirming this group's strong optimism about its own anticipated longevity, even after the information was provided to all respondents.[12]

Last, we investigate how people differed with regard to their advice to the vignette individuals to save or annuitize more. Results in Table 7 focus on whether the respondent recommended that (1) the vignette individual significantly increase savings, or (2) annuitize part of his retirement assets. The odd numbered columns report results for all respondents, while the even numbered columns include only those whose subjective survival probabilities were below those from the life tables. An interesting result is that, of all the race/ethnicity groups, the African Americans underestimators were most likely to recommend saving more and annuitizing to the vignette individuals in 2020; in 2021 the effects remain positive albeit less statistically significant.[13]

12 Full results are provided in Online Appendix Table 6.
13 Full results appear in Online Appendix Table 7.

Table 7. Factors shaping saving and annuitization advice, 2020-2021 panel (Marginal Logit effects reported)

	2020 Responders				2021 Responders			
	Savings vignette		Annuitization vignette		Savings vignette		Annuitization vignette	
	All responders	Under-estimators	All responders	Under-estimators	All responders	Under-estimators	All responders	Under-estimators
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Hispanic	0.104	-0.172	-0.036	0.105	0.072	0.160	0.015	0.055
	(0.094)	(0.192)	(0.064)	(0.070)	(0.087)	(0.174)	(0.057)	(0.074)
African American	0.028	0.251***	0.040	0.166***	0.020	0.221**	0.088**	0.085
	(0.064)	(0.077)	(0.051)	(0.054)	(0.085)	(0.098)	(0.044)	(0.119)
Asian/PacI	-0.046	-0.157	-0.011	-0.117	0.024	0.083	-0.109	-0.305*
	(0.082)	(0.162)	(0.069)	(0.143)	(0.085)	(0.154)	(0.082)	(0.168)
Other race	0.096	0.121	-0.053	0.013	0.259***	0.192	-0.024	-0.056
	(0.111)	(0.154)	(0.083)	(0.132)	(0.067)	(0.123)	(0.101)	(0.173)
Mean dependent var	0.57	0.61	0.77	0.77	0.59	0.62	0.77	0.80
SD dependent var	0.50	0.49	0.42	0.42	0.49	0.49	0.421	0.402

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
Other controls include age, sex, marital status, education, good health, FinLit and numeracy score, present bias, income, # people in household, chances of dying from Covid > 50%, and paid attention; see Online Appendix Table 7. Source: Authors' calculations; see text.

Conclusions and implications

In this paper we have posed and answered four questions regarding differences across racial and ethnic groups' longevity perceptions and what these imply for financial decision-making. We summarize as follows:

Q1. Do members of different race/ethnic groups differ from Whites, with regard to their own subjective survival probabilities and overall population survival chances?

A: Consistent with previous research, we find that Hispanics overestimated their survival chances more than their White counterparts, as did African Americans. Asian/Pacific Islanders were also more prone to overestimate their survival chances (though less so than the African Americans). The result related to Asian/Pacific Islanders estimation seems reasonable, as this group's objective survival probability is also higher. People self-reporting themselves as "other" races appear to have subjective survival probabilities similar to Whites'.

Q2. How did people's subjective survival probabilities change from 2020 to 2021, a year into the pandemic, and did these differ for Whites, African Americans, Hispanics, Asians/Pacific Islanders, and others?

A: A year into the Covid-19 pandemic, changes in subjective survival probabilities did not differ much by race/ethnicity. That is, few of the race/ethnicity coefficient estimates are statistically significant in our analysis of changes in survival chances over this period.

Q3. Were subjective survival probabilities differentially altered if respondents received either longevity or life expectancy information, and were they influenced by being shown vignettes where they had to recommend saving and annuitization behavior to hypothetical individuals?

A: The information treatments did not change people's subjective survival probabilities. Yet seeing the vignette first did reduce subjective survival optimism among Hispanics, African Americans, and those self-identifying as an "other" race.

Q4. Did recommendations regarding saving and annuitization behavior differ systematically between Whites, African Americans, Hispanics, Asians/Pacific Islanders, and others, after controlling on other factors?

A. After having seen the life expectancy treatment, those who had previously underestimated their survival chances

were more likely to recommend saving more, and more likely to recommend annuitization. Across race/ethnicity groups, the African Americans underestimators were most likely to recommend saving more and annuitizing to the vignette individuals in 2020; in 2021 the effects remained positive but less statistically significant.

This information is likely to be of interest for industry and policymakers for several reasons. First, the finding that African Americans and Hispanics tend to have higher self-assessed survival probabilities compared to life tables is a robust result in our data. This could imply that members of these groups would be more likely than Whites to be interested in retirement saving and annuitization in later life. Second, providing our respondents with information about life expectancies and longevity did not have a differential impact on African Americans' and Hispanics' subjective survival optimism. This suggests that additional information treatments would be needed to better explain the nature of and consequences of longevity. And finally, we confirmed that getting people to think about long-term financial decisions can shape the recommendations they give regarding saving and annuitizing, particularly to the subset of persons that underestimates their longevity. These findings illuminate the importance of finding ways to encourage people to make better financial decisions essential for later life.

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Online appendix

Online Appendix Table 1. Full set of variables

Variable	N	Mean	Std. Dev.
2020 SLE-LE(X)	2,008	18.40	30.44
2020 SLE-LE(X-5)	2,037	3.47	30.03
2021 SLE-LE(X)	1,954	15.70	29.23
2021 SLE-LE(X-5)	1,970	1.07	29.15
ΔSLE-LE(X)	1,817	-2.58	25.57
ΔSLE-LE(X-5)	1,842	-1.98	24.21
PopLongPlus	2,077	-0.39	1.11
PopLELongPlus	2,103	-0.21	0.98
Hispanic	2,298	0.04	0.20
African American	2,298	0.07	0.25
Asian/Pacl	2,298	0.05	0.21
Others, race	2,298	0.03	0.16
Age	2,298	49.84	10.04
Female	2,298	0.57	0.49
College+	2,298	0.60	0.49
White, non-Hispanic	2,298	0.81	0.39
Married	2,298	0.56	0.50
Good health	2,298	0.84	0.37
FinLit score	2,298	2.47	0.80
Numeracy Index	2,298	1.87	1.05
Present preference	2,298	1.74	1.40
Income ($100k)*	2,298	0.10	0.20
#People living in HH*	2,270	2.56	1.40
Attention	2,298	0.57	0.49
2020 Die from Covid>50%	2,077	0.09	0.29
2021 Die from Covid>50%	1,827	0.07	0.25
Saw vignette first	2,298	0.26	0.44
Life expectancy treatment	2,298	0.31	0.46
Longevity treatment	2,298	0.33	0.47

Source: Authors' calculations see text.

Online Appendix Table 2. Live to age X and X-5 by sex and age

	Fills by age and gender			
	Male		Female	
Age	*X*	*X-5*	*X*	*X-5*
35-39	55	50	60	55
40-44	50	45	55	50
45-49	45	40	50	45
50-54	40	35	45	40
55-59	35	30	40	35
60-64	30	25	35	30
65-69	25	20	30	25
70-74	20	15	25	20
75-79	15	10	20	15
80-84	15	10	15	10
85-90	10	5	10	5

Online Appendix Table 3. Full results for table 3

	2020 SLE-LE(X)		2021 SLE-LE(X)		2020 SLE-LE(X-5)		2021 SLE-LE(X-5)	
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Hispanic or Latino	5.757*	1.365	6.242*	4.198	1.703	-1.873	3.790	4.097
	(3.376)	(3.354)	(3.255)	(3.496)	(3.317)	(3.339)	(3.232)	(3.476)
African American	14.615***	10.025***	21.335***	17.771***	13.186***	10.906***	15.960***	16.304***
	(2.842)	(3.058)	(2.798)	(3.220)	(2.787)	(3.001)	(2.765)	(3.151)
Asian/Pacific Islander	11.388***	9.049***	9.981***	5.219	9.929***	8.877***	8.641***	4.384
	(3.357)	(3.375)	(3.098)	(3.350)	(3.263)	(3.300)	(3.128)	(3.353)
Ethnicity, other	2.283	4.552	6.636	14.100***	0.304	4.329	1.594	11.166**
	(4.212)	(4.164)	(4.052)	(4.424)	(4.163)	(4.121)	(4.148)	(4.539)
Age		-0.181**		-0.111		0.098		0.117
		(0.072)		(0.072)		(0.071)		(0.072)
Female		-0.833		-0.150		-0.855		-1.110
		(1.411)		(1.417)		(1.388)		(1.410)
College+		2.907**		2.397		2.140		4.828***
		(1.470)		(1.470)		(1.447)		(1.465)
Married		2.633*		1.483		3.798**		2.528
		(1.557)		(1.622)		(1.537)		(1.617)
Good health		18.355***		18.265***		19.791***		19.852***
		(1.910)		(1.877)		(1.876)		(1.867)
Finlit score		-3.046***		-1.813		-2.623***		-2.070*
		(1.011)		(1.136)		(0.993)		(1.132)
Num score		-2.690***		-2.931***		-1.950***		-1.877**
		(0.760)		(0.769)		(0.742)		(0.769)
Present preference		0.242		0.067		0.062		0.071
		(0.496)		(0.503)		(0.488)		(0.501)
Income ($100k)		3.201		7.034		5.192		5.468
		(3.467)		(4.366)		(3.418)		(4.409)
#People in HH		0.025		0.097		-0.445		0.218
		(0.565)		(0.601)		(0.556)		(0.600)
2020 Die from Covid>50%		-4.177*				-4.969**		
		(2.352)				(2.320)		
2021 Die from Covid>50%,				-6.211**				-7.716***
				(2.795)				(2.805)
Constant	16.741***	18.588***	13.559***	12.813**	2.166***	-11.912**	-0.476	-17.765***
	(0.740)	(5.266)	(0.715)	(5.614)	(0.726)	(5.184)	(0.716)	(5.565)
Observations	2,008	1,868	1,954	1,643	2,037	1,894	1,970	1,658
R^2	0.02	0.10	0.03	0.12	0.02	0.10	0.02	0.12
Mean of dep. var	18.41	17.99	15.70	15.20	3.47	3.38	1.07	0.92
Std.dev of dep. var	30.44	30.20	29.23	28.95	30.03	29.82	29.15	29.00

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Other control included paid attention.
Source: Authors' calculations see text.

Online Appendix Table 4. Full results for Table 4

	Change between SLE-LE(X) from 2020 to 2021		Change between SLE-LE(X-5) from 2020 to 2021	
Variables	**OLS**	**Heckman**	**OLS**	**Heckman**
Hispanic or Latino	-2.406	0.920	1.330	4.174
	(3.459)	(4.020)	(3.279)	(3.912)
African American	3.575	17.966*	2.572	14.452
	(3.426)	(9.518)	(3.197)	(9.478)
Asian or Pacific Islander	-2.257	11.072	-0.925	10.769
	(3.428)	(8.911)	(3.195)	(9.346)
Ethnicity, others	4.471	9.723*	3.336	11.375
	(4.356)	(5.428)	(4.246)	(7.382)
Age	0.088	0.286**	0.053	0.099
	(0.072)	(0.142)	(0.068)	(0.076)
Female	0.937	-0.819	-0.210	-1.684
	(1.399)	(1.769)	(1.313)	(1.717)
College+	0.839	2.929	4.239***	4.756***
	(1.457)	(1.945)	(1.367)	(1.421)
Married	-0.587	-3.221	0.390	-1.312
	(1.592)	(2.275)	(1.502)	(1.972)
Good health	0.713	-1.030	0.435	-1.089
	(1.888)	(2.173)	(1.770)	(2.108)
Finlit score	0.964	-6.945	-0.192	-6.337
	(1.144)	(5.014)	(1.081)	(4.741)
Num ind	-0.316	-4.495*	-0.144	-3.621
	(0.769)	(2.691)	(0.723)	(2.710)
Present preference	-0.252	0.480	0.191	0.392
	(0.498)	(0.672)	(0.468)	(0.492)
Income ($100k)	-1.008	-6.888	-3.865	-6.504
	(4.453)	(5.742)	(4.227)	(4.668)
#People in HH	-0.530	-0.507	-0.266	-0.240
	(0.586)	(0.585)	(0.554)	(0.554)
2020 Die from Covid>50%, 2020	0.673	0.788	1.170	1.222
	(2.662)	(2.661)	(2.509)	(2.509)
2021 Die from Covid>50%,	-0.148	-0.202	-0.758	-0.820
	(3.020)	(3.018)	(2.837)	(2.837)
lambda		-72.281		-59.316
		(44.608)		(44.553)
Constant	-7.748	36.501	-5.026	36.216
	(5.628)	(27.881)	(5.300)	(31.427)
Observations	1,479	1,479	1,502	1,502
R^2	0.01	0.01	0.01	0.01
Mean of dep. var	-3.03	-3.03	-2.40	-2.40
Std.dev of dep. var	25.52	25.52	24.24	24.24

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Other control included paid attention.
Source: Authors' calculations see text.

Online Appendix Table 5. Full results for Table 5

	PopLongPlus		PopLELongPlus	
Variables	**OLS**	**Heckman OLS**	**OLS**	**Heckman OLS**
Hispanic	-0.243*	-0.592***	-0.036	-0.168
	(0.135)	(0.205)	(0.118)	(0.140)
African American	-0.066	0.334	-0.046	0.166
	(0.124)	(0.216)	(0.107)	(0.161)
Asian/Pacl	-0.006	0.140	0.080	0.190
	(0.136)	(0.151)	(0.117)	(0.133)
Other race	-0.144	-0.106	-0.220	-0.100
	(0.176)	(0.177)	(0.154)	(0.168)
Age	0.008***	0.006**	0.007***	0.006**
	(0.003)	(0.003)	(0.002)	(0.003)
Female	-0.122**	-0.126**	-0.124**	-0.085
	(0.056)	(0.056)	(0.049)	(0.054)
College+	0.143**	0.113*	0.145***	0.156***
	(0.059)	(0.060)	(0.051)	(0.051)
Married	0.053	0.054	-0.048	-0.050
	(0.065)	(0.065)	(0.056)	(0.056)
Good health	0.094	0.011	0.087	0.018
	(0.075)	(0.083)	(0.065)	(0.076)
Finlit score	-0.150***	-0.448***	-0.130***	-0.353***
	(0.043)	(0.139)	(0.038)	(0.133)
Num ind	-0.020	-0.137**	-0.053**	-0.108***
	(0.031)	(0.060)	(0.026)	(0.041)
Present preference	0.008	0.007	-0.020	-0.030
	(0.020)	(0.020)	(0.017)	(0.018)
Income ($100k)	0.476***	0.933***	0.406**	0.656***
	(0.185)	(0.274)	(0.159)	(0.213)
#People in HH	0.028	0.030	0.063***	0.064***
	(0.024)	(0.024)	(0.020)	(0.020)
Die from Covid>50%	0.114	0.112	0.072	0.070
	(0.115)	(0.115)	(0.098)	(0.098)
lambda		-3.529**		-2.326*
		(1.563)		(1.327)
Constant	-0.564**	1.151	-0.320*	0.773
	(0.219)	(0.791)	(0.190)	(0.652)
Observations	1,716	1,716	1,740	1,740
R^2	0.03	0.03	0.03	0.03
Mean of dep. var	-0.39	-0.39	-0.21	-0.21
Std.dev of dep. var	1.12	1.12	0.98	0.98

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Other control included paid attention.
Source: Authors' calculations see text.

Online Appendix Table 6. Full results for Table 6

	2020 Responders		2021 Responders	
Variables	SLE-LE(X): Vignette first	SLE-LE(X): Full sample	SLE-LE(X): Vignette first	SLE-LE(X): Full sample
Saw vignette first		-5.201***		-5.382***
		(1.506)		(1.513)
Life expectancy treatment	0.163	0.097	-3.555	-0.725
	(3.281)	(1.639)	(3.074)	(1.653)
Longevity treatment	-0.418	-0.377	0.992	1.185
	(3.118)	(1.607)	(2.953)	(1.638)
Hispanic	-2.707	1.329	2.742	4.128
	(6.267)	(3.350)	(6.343)	(3.490)
African American	3.536	10.203***	18.580***	18.194***
	(5.815)	(3.053)	(5.375)	(3.213)
Asian/PacI	3.993	9.226***	4.563	5.701*
	(5.935)	(3.372)	(5.320)	(3.343)
Other race	8.650	4.678	19.835***	14.342***
	(7.773)	(4.154)	(7.213)	(4.413)
Age	(0.184)	(0.185)**	(0.066)	(0.122)*
	(0.187)	(0.072)	(0.174)	(0.072)
Female	-0.189	-0.778	1.233	-0.019
	(2.734)	(1.408)	(2.554)	(1.412)
College+	3.937	3.030**	3.916	2.348
	(2.887)	(1.464)	(2.676)	(1.467)
Married	-0.406	2.526	2.320	1.602
	(3.111)	(1.561)	(2.913)	(1.617)
Good health	15.231***	18.299***	14.128***	18.290***
	(3.853)	(1.908)	(3.499)	(1.873)
Fin lit score	-4.850**	-3.008***	-3.376*	-1.932*
	(1.973)	(1.011)	(1.947)	(1.133)
Num index	(2.247)	(2.736)***	(3.112)**	(2.883)***
	(1.523)	(0.760)	(1.340)	(0.767)
Present pref	-0.120	0.154	-0.995	0.128
	(0.991)	(0.496)	(0.896)	(0.503)
Income ($100k)	4.179	3.904	1.092	7.118
	(5.040)	(3.469)	(8.290)	(4.358)
# in HH	(0.376)	0.178	(1.086)	0.187
	(1.045)	(0.554)	(1.027)	(0.599)
Die Covid>50%	3.482	-4.690**	-6.724	-6.541**
	(5.614)	(2.350)	(5.778)	(2.790)
Constant	23.254**	19.832***	18.329*	14.521**
	(11.766)	(5.353)	(10.969)	(5.715)
Observations	511	1,868	458	1,643
R^2	0.07	0.11	0.13	0.12
Mean dependent var	15.25	17.99	12.56	15.20
SD dependent var	29.73	30.20	27.14	28.95

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Other control included paid attention.
Source: Authors' calculations see text.

Online Appendix Table 7. Full results for Table 7

	2020 Responders				2021 Responders			
	Savings vignette		Annuitization vignette		Savings vignette		Annuitization vignette	
	All responders	Under-estimators	All responders	Under-estimators	All responders	Under-estimators	All responders	Under-estimators
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Saw vignette first	-0.002	0.077	0.019	0.031	0.103***	0.095	0.039	0.017
	(0.038)	(0.057)	(0.029)	(0.047)	(0.038)	(0.058)	(0.030)	(0.046)
Life expectancy treatment	-0.010	0.083	0.062**	0.046	-0.085*	-0.034	0.061*	0.097**
	(0.041)	(0.062)	(0.030)	(0.050)	(0.044)	(0.070)	(0.031)	(0.049)
Longevity treatment	0.020	0.084	-0.014	0.077	-0.072*	-0.095	0.046	0.001
	(0.040)	(0.064)	(0.031)	(0.048)	(0.043)	(0.069)	(0.031)	(0.050)
Hispanic	0.104	-0.172	-0.036	0.105	0.072	0.160	0.015	0.055
	(0.094)	(0.192)	(0.064)	(0.070)	(0.087)	(0.174)	(0.057)	(0.074)
African American	0.028	0.251***	0.040	0.166***	0.020	0.221**	0.088**	0.085
	(0.064)	(0.077)	(0.051)	(0.054)	(0.085)	(0.098)	(0.044)	(0.119)
Asian/PacI	-0.046	-0.157	-0.011	-0.117	0.024	0.083	-0.109	-0.305*
	(0.082)	(0.162)	(0.069)	(0.143)	(0.085)	(0.154)	(0.082)	(0.168)
Other race	0.096	0.121	-0.053	0.013	0.259***	0.192	-0.024	-0.056
	(0.111)	(0.154)	(0.083)	(0.132)	(0.067)	(0.123)	(0.101)	(0.173)
Age	0.001	0.002	0.001	0.003	0.004*	0.005*	0.002	0.000
	(0.002)	(0.003)	(0.001)	(0.002)	(0.002)	(0.003)	(0.001)	(0.002)
Female	0.038	-0.005	-0.005	-0.006	-0.070*	-0.168***	-0.008	-0.018
	(0.035)	(0.058)	(0.028)	(0.046)	(0.036)	(0.056)	(0.030)	(0.047)
College+	0.132***	0.090	0.022	-0.003	0.198***	0.123**	0.044	0.065
	(0.035)	(0.058)	(0.029)	(0.049)	(0.037)	(0.059)	(0.031)	(0.049)
Married	0.061	-0.003	-0.045	-0.090*	0.056	0.044	0.070**	0.091
	(0.039)	(0.062)	(0.031)	(0.051)	(0.044)	(0.067)	(0.035)	(0.057)
Good health	-0.013	0.006	-0.041	-0.022	-0.034	0.079	-0.084**	-0.023
	(0.047)	(0.063)	(0.036)	(0.052)	(0.049)	(0.071)	(0.033)	(0.049)
Fin lit score	0.144***	0.152***	0.058***	0.082**	0.148***	0.107**	0.039*	-0.001
	(0.026)	(0.045)	(0.018)	(0.033)	(0.030)	(0.049)	(0.020)	(0.033)
Num Score	0.031*	0.031	(0.017)	0.033	(0.005)	(0.003)	0.018	0.044**
	(0.018)	(0.031)	(0.016)	(0.025)	(0.021)	(0.036)	(0.015)	(0.021)
Present pref	-0.055***	-0.070***	-0.028***	-0.012	-0.058***	-0.062***	-0.025**	-0.012
	(0.012)	(0.020)	(0.010)	(0.017)	(0.013)	(0.020)	(0.011)	(0.017)
Income ($100k)	0.085	0.209	0.098	0.131	0.023	0.146	-0.049	-0.087
	(0.110)	(0.263)	(0.076)	(0.151)	(0.121)	(0.460)	(0.092)	(0.144)
# in Household	(0.011)	0.021	0.003	0.015	0.007	(0.016)	0.001	(0.012)
	(0.014)	(0.024)	(0.011)	(0.020)	(0.016)	(0.025)	(0.013)	(0.023)
Die Covid>50%	(0.051)	0.045	(0.053)	0.022	0.059	0.065	0.010	(0.067)
	(0.062)	(0.084)	(0.052)	(0.066)	(0.072)	(0.089)	(0.058)	(0.101)
Observations	1,044	388	1,015	384	915	348	911	328
R2	0.10	0.11	0.04	0.07	0.12	0.11	0.04	0.07
Mean dependent var	0.57	0.61	0.77	0.77	0.59	0.62	0.77	0.80
SD dependent var	0.50	0.49	0.42	0.42	0.49	0.49	0.421	0.402

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Other control included paid attention.
Source: Authors' calculations, see text.

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Acknowledgements: The authors acknowledge research support for this work from the TIAA Institute, the Pension Research Council/Boettner Center at The Wharton School of the University of Pennsylvania, the Kruger Center and the Albertson-Waltuch Chair in Business Administration at the Hebrew University, and excellent programming support from Yong Yu. All findings and conclusions expressed are those of the authors and not the official views of the TIAA Institute or any of the other institutions with which the authors are affiliated. This research is part of the NBER Aging program and the Household Finance workshop.

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(06/22)