Online Appendix with Supplementary Material for

S*ea*TE: Subjective *ex ante* Treatment Effect of Health on Retirement

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Appendix A. Additional Results for VRI

Table A1. Sample Selection

Selection Stages	Sample Size
Total sample in Survey 4	3314
Not eligible for the 2 years expectations battery	2249
Career salary reported as 0 USD	9
Not in high health	29
Inconsistent answer to 2 years expectations questions	57
2 Years Sample	**970**
Not eligible for the 4 years expectations battery	87
Inconsistent answer to 4 years expectations questions	44
4 Years Sample	**839**

Table A2. Sample Characteristics

Characteristic	2-Year Ahead Percent	4-Year Ahead Percent
Age (at VRI Survey 4)		
≤59	22.89	24.43
60-61	14.02	14.30
62	6.70	7.03
63-64	13.40	13.35
65	4.95	4.17
66-67	8.45	8.70
68-69	8.56	8.22
70-71	5.15	5.24
≥72	15.88	14.54
Gender		
Female	37.01	36.83
Male	62.99	63.17
Race/ethnicity		
Non-Hispanic white	94.74	94.87
Asian	2.68	2.86
Other	2.58	2.26
Marital status (at VRI S4)		
Partnered (married & share financial future)	65.46	64.84
Not partnered	34.54	35.16
Educational attainment		
High school or less	5.77	5.96
Some college	14.95	13.83
College graduate	38.97	38.38
Other advanced degree	19.59	20.50
MBA	7.94	8.46
JD, PhD, MD	12.78	12.87
Health status (at VRI S4)		
High (excellent, very good, or good)	100	100
Employment status (at VRI S4)		
Working (full-time or part-time)	100	100
Job type (at VRI S4)		
Career	60.62	61.50
Bridge	39.38	38.50
Occupation (at VRI S4)		
Management and professional	71.75	71.99
Other services	17.32	17.04
Operative	10.96	10.97
Observations	970	839

Characteristic	2-Year Ahead Percent	4-Year Ahead Percent
Total household wealth in USD (at VRI S4)		
First quintile	0 – 258,475	0 – 255,584
Second quintile	258,475 – 533,739	255,584 – 537,700
Third quintile	533,739 – 874,860	537,700 – 877,000
Fourth quintile	874,860 – 1,583,538	877,000 – 1,559,059
Fifth quintile	≥1,583,538	≥1,559,059
Replacement rate (Expected pension & SS; replacement rate, career job wage, at VRI S4)		
First quintile	0 – 24	0 – 24
Second quintile	24 – 39	24 – 39
Third quintile	39 – 58	39 – 58
Fourth quintile	58 – 87	58 – 88
Fifth quintile	87 +	88 +
Annual salary in USD (at VRI S4)		
First quintile	0 – 12,000	0 – 13,000
Second quintile	12,000 – 45,714	13,000 – 47,000
Third quintile	45,714 – 77,534	47,000 – 80,000
Fourth quintile	77,534 – 117,000	80,000 – 120,000
Fifth quintile	≥117,000	≥120,000
Spouse's age (at VRI S4)		
≤59	28.50	29.96
60-61	15.12	15.81
62	5.51	5.15
63-64	11.97	12.13
65	3.78	4.04
66-67	7.56	6.99
68-69	9.13	9.01
70-71	4.57	4.41
≥72	13.86	12.50
Sample size	635	544
Spouse's health status (at VRI S4)		
Excellent	21.57	21.51
Very good	44.25	44.67
Good	25.83	26.10
Fair	6.93	6.80
Poor	1.42	0.92
Sample size	635	544
Spouse's employment status (at VRI S4)		
Working (full-time or part-time)	48.82	49.08
Not working	51.18	50.92
Sample size	635	544
Observations	970	839

Table A3. Quantifying Cross-Sectional Heterogeneity in DP Values, With Covariates

Health state	2-Year Ahead		4-Year Ahead	
	h=H	*h=L*	*h=H*	*h=L*
Constant	1.34***	-0.39	0.43	-0.44*
	(0.35)	(0.24)	(0.40)	(0.24)
Age				
60-61	-0.41**	-0.34***	-0.47**	-0.32***
	(0.17)	(0.12)	(0.20)	(0.12)
62	-0.18	-0.51***	-0.99***	-0.48***
	(0.22)	(0.16)	(0.25)	(0.16)
63-64	-1.08***	-0.46***	-1.23***	-0.61***
	(0.18)	(0.13)	(0.20)	(0.13)
65	-1.43***	-0.57***	-1.01***	-0.79***
	(0.25)	(0.18)	(0.31)	(0.19)
66-67	-1.07***	-0.34**	-1.54***	-0.41***
	(0.21)	(0.15)	(0.24)	(0.15)
68-69	-1.22***	-0.86***	-1.36***	-0.77***
	(0.21)	(0.15)	(0.24)	(0.15)
70-71	-1.15***	0.72***	-1.16***	-0.74***
	(0.26)	(0.18)	(0.30)	(0.18)
≥ 72	-1.03***	-0.71***	-1.01***	-0.72***
	(0.19)	(0.14)	(0.23)	(0.14)
Gender				
Female	-0.09	-0.04	0.03	-0.08
	(0.12)	(0.08)	(0.14)	(0.08)
Education				
Some college	-0.16	-0.16	0.13	-0.08
	(0.25)	(0.17)	(0.29)	(0.18)
College grad	-0.08	-0.03	0.07	-0.01
	(0.24)	(0.16)	(0.27)	(0.16)
Other adv. degree	0.15	-0.13	0.15	0.03
	(0.25)	(0.18)	(0.29)	(0.18)
MBA	0.13	-0.06	0.16	0.01
	(0.29)	(0.20)	(0.33)	(0.20)
JD, PhD, MD	0.18	-0.09	0.55	-0.19
	(0.28)	(0.20)	(0.32)	(0.20)
Occupation				
Operative	0.04	0.06	0.04	-0.01
	(0.14)	(0.10)	(0.17)	(0.10)
Other services	0.11	0.05	0.12	-0.00
	(0.18)	(0.13)	(0.21)	(0.13)
Job type				
Bridge	-0.05	0.01	0.03	-0.08
	(0.12)	(0.09)	(0.14)	(0.09)
Marital status				
Partnered	-0.35***	-0.14	-0.16	-0.16*
	(0.13)	(0.09)	(0.16)	(0.10)

Spouse's work status	0.36***	0.03	0.02	0.04
Working	(0.13)	(0.09)	(0.15)	(0.09)
Total HH wealth				
First quintile	0.92***	0.19	1.02***	0.16
	(0.19)	(0.13)	(0.22)	(0.14)
Second quintile	0.68***	0.01	1.01***	-0.09
	(0.18)	(0.13)	(0.21)	(0.13)
Third quintile	0.40**	0.02	0.39**	-0.04
	(0.17)	(0.12)	(0.20)	(0.12)
Fourth quintile	0.24	-0.02	0.28	-0.10
	(0.16)	(0.12)	(0.19)	(0.12)
Replacement rate				
First quintile	0.24	0.10	0.47**	0.14
	(0.18)	(0.12)	(0.20)	(0.12)
Second quintile	0.29*	0.09	0.09	0.22*
	(0.17)	(0.12)	(0.20)	(0.12)
Third quintile	0.19	0.008	0.09	-0.00
	(0.17)	(0.12)	(0.20)	(0.12)
Fourth quintile	-0.05	-0.14	-0.11	-0.01
	(0.17)	(0.12)	(0.20)	(0.12)
Current salary				
First quintile	-0.49**	-0.20	-0.07	-0.11
	(0.21)	(0.14)	(0.24)	(0.15)
Second quintile	0.22	-0.11	0.33	0.00
	(0.19)	(0.13)	(0.22)	(0.13)
Third quintile	-0.06	0.02	0.09	0.09
	(0.18)	(0.12)	(0.21)	(0.12)
Fourth quintile	-0.19	0.01	-0.12	-0.04
	(0.17)	(0.12)	(0.19)	(0.12)
γ		0.64***		0.61***
		(0.02)		(0.02)
$\sigma(\upsilon^h)$	1.56	1.09	1.67	1.02
Observations	970	970	839	839
R^2	0.19	0.58	0.16	0.61

Notes: Table shows mean as a linear index of covariates, covariance, and variability of the measured differenced conditional value functions $\tilde{v}^H$ and $\tilde{v}^L$ as specified in equation (1.24) of text. *** significant at 1%, ** significant at 5%, * significant at 10%.

Table A4. Selectivity into Panel Sample

Constant	0.626***
	(0.095)
Age	
60-61	-0.011
	(0.053)
62	-0.030
	(0.069)
63-64	-0.003
	(0.055)
65	-0.016
	(0.079)
66-67	0.064
	(0.065)
68-69	0.011
	(0.065)
70-71	0.177**
	(0.078)
≥ 72	0.055
	(0.053)
Probability of working in 2 years	0.024
	(0.047)
Probability of high health in 2 years	-0.073
	(0.096)
Observations	970
R^2	0.0098

Note: *** significant at 1%, ** significant at 5%, * significant at 10%.

Table A5. Panel Results: Realizations and DP Values (means)

A. Conditional DP Values, By *ex ante* Health

	E	VG	G	F	P
E	1.070	0.951		-0.494	
VG	0.970		0.884	-0.383	
G	0.906		0.806	-0.321	

B. Realized Working Status, By Realized Health

	E	VG	G	F	P
E	0.738	0.719		0	
VG	0.712		0.692	--	
G	0.679		0.701	0.667	

Note: The "—" indicates value was suppressed due to low cell count. Panel B is the same as Panel B of Table 9 of the main text.

Table A6. Panel Results: Predicting Work Using Conditional DP Values

	Ex ante health		Realized health	
Constant	0.621***	0.669***	0.600***	0.651***
	(0.018)	(0.408)	(0.019)	(0.041)
DP Value Conditional on Health	0.124***		0.123***	
	(0.010)		(0.010)	
Age				
≤ 59		-0.047		-0.062
		(0.070)		(0.072)
60-61		-0.148**		-0.157**
		(0.069)		(0.071)
62		-0.276***		-0.286***
		(0.087)		(0.089)
63-64		-0.003		-0.012
		(0.063)		(0.064)
65		-0.183**		-0.152*
		(0.089)		(0.089)
66-67		-0.036		-0.054
		(0.069)		(0.070)
68-69		-0.054		-0.068*
		(0.071)		(0.072)
70-71		0.112		0.126
		(0.078)		(0.078)
DP Value Conditional on Health Interacted with Age				
≤ 59		0.134***		0.140***
		(0.028)		(0.027)
60-61		0.133***		0.139***
		(0.030)		(0.029)
62		0.187***		0.175***
		(0.043)		(0.040)
63-64		0.132***		0.139***
		(0.028)		(0.027)
65		0.154***		0.119***
		(0.043)		(0.041)
66-67		0.150***		0.150***
		(0.039)		(0.036)
68-69		0.172***		0.164***
		(0.033)		(0.032)
70-71		0.037		0.033
		(0.047)		(0.045)
≥ 72		0.089***		0.086***
		(0.023)		(0.022)
Observations	584	584	584	584
R^2	0.201	0.243	0.211	0.253

Note: *** significant at 1%, ** significant at 5%, * significant at 10%.

Figure A1. Unconditional Probability of Low Health and Working, By Age
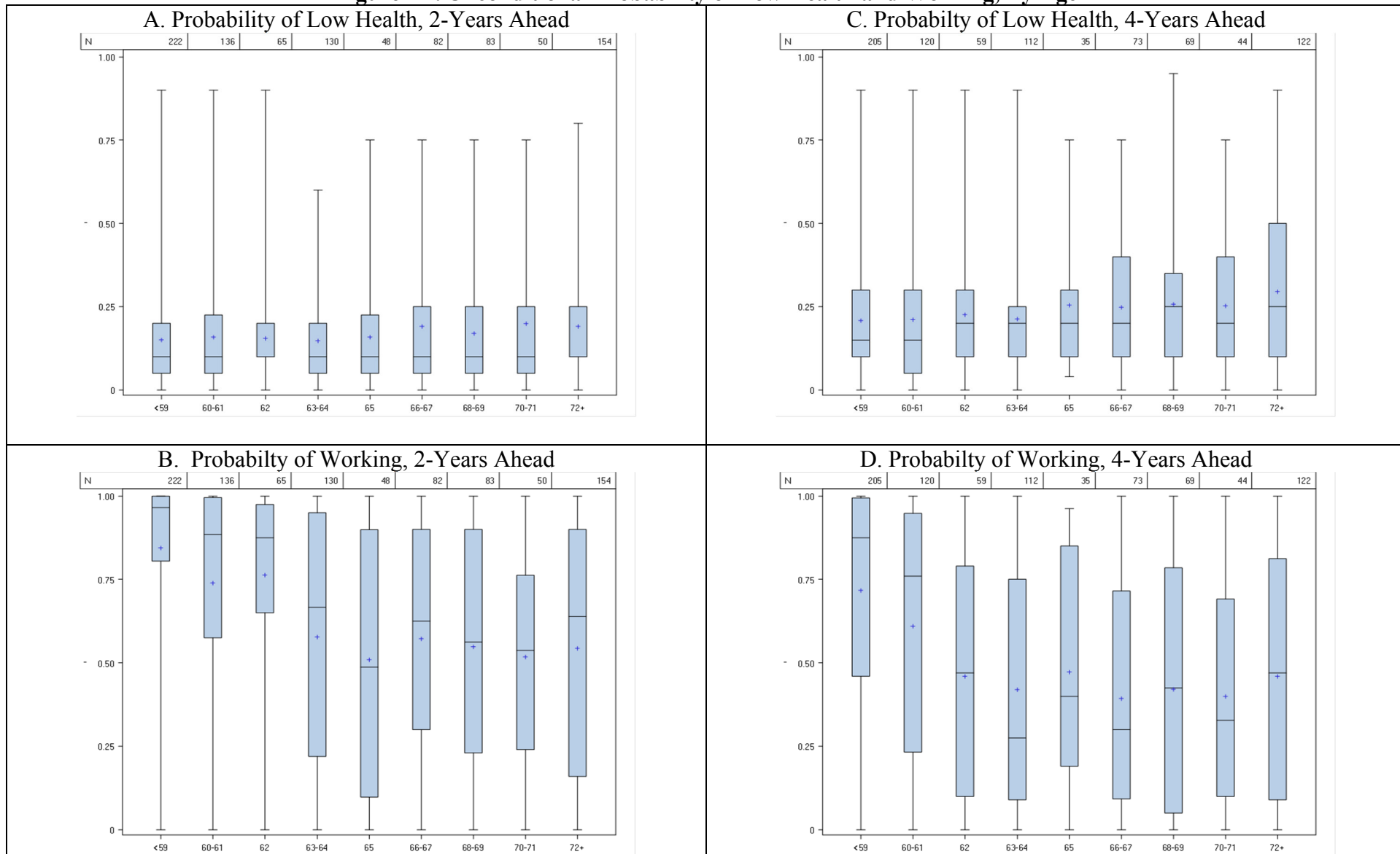
Note: Box and whiskers plots of the distribution of unconditional probability of low health and work 2- and 4-years ahead. The "+" is the mean, the mid-line is the median, and the box shows inter-quartile range. Age is as of time of the survey.

Appendix B. Additional Results for HRS

Table B1. HRS Sample Selection

Selection Stages	Sample Size
Total sample in 2016 HRS Experimental Module	1082
Age < 50	55
Not in labor force	326
Not in high health	102
Inconsistent or missing answer to 2 years expectations questions	119
2 Years Sample	**480**
Not eligible for the 4 years expectations battery	37
Probability of high health in 4 years is 0	1
Missing answer to 4 years health expectations questions	14
4 Years Sample	**428**

Table B2. HRS Sample Characteristics

	2-Year Ahead	4-Year Ahead
	Percent	Percent
Age (at HRS 2016)		
≤54	8.75	9.35
55-59	44.17	46.03
60-61	22.29	20.79
62	10.21	9.81
63-64	14.58	14.02
Gender		
Female	53.96	52.10
Male	46.04	47.90
Race/ethnicity		
Non-Hispanic white	61.04	63.55
Black or African American	17.92	16.36
Hispanic	15.63	15.19
Other	5.42	4.91
Marital status (at HRS 2016)		
Married	70.00	71.50
Not married	29.58	28.04
Other/Unknown	0.42	0.47
Educational attainment		
Less than high school (no degree and GED)	12.71	10.05
High school diploma	37.71	38.08
Some college	12.50	11.92
College graduate	22.50	24.07
Post college (Master, PhD, MD, JD)	14.58	15.89
Health status (at HRS 2016)		
High (excellent, very good, or good)	100	100
Employment status (at HRS 2016)		
In the labor force	100	100
Observations	480	428

<div align="center">**Table B2 (Continued). HRS Sample Characteristics**</div>

	2-Year Ahead	4-Year Ahead
	Percent	Percent
Total household wealth in USD (at HRS 2016)		
First quintile	-699,500 – 0	-699,500 – 0
Second quintile	0 – 1,050	0 – 2,200
Third quintile	1,050 – 30,000	2,200 – 34,000
Fourth quintile	30,000 – 213,000	34,000 – 247,000
Fifth quintile	≥ 213,000	≥ 247,000
Annual salary in USD (at HRS 2016)		
First quintile	0 – 15,000	0 – 16,958
Second quintile	15,000 – 30,160	16,958 – 33,000
Third quintile	30,160 – 49,560	33,000 – 50,770
Fourth quintile	49,560 – 75,200	50,770 – 80,000
Fifth quintile	≥ 75,200	≥ 80,000
Spouse's age (at HRS 2016)		
≤54	15.74	16.40
55-59	36.15	36.33
60-61	13.12	13.18
62	8.16	8.36
63-64	13.12	11.90
65	4.08	3.86
66-67	3.50	3.86
68-69	2.04	2.25
70-71	0.87	0.64
72+	3.21	3.22
Sample size	343	311
Spouse's health status (at HRS 2016)		
Excellent	11.37	11.25
Very good	31.20	31.83
Good	30.32	30.23
Fair	13.41	13.23
Poor	5.54	5.14
Missing	8.16	8.36
Sample size	343	311
Spouse's employment status (at HRS 2016)		
Working (full-time or part-time)	63.56	64.31
Not working	28.28	27.33
Missing	8.16	8.36
Sample size	343	311
Observations	480	428

Table B3. Predictors of 2- and 4-Year Ahead S*ea*TE: HRS

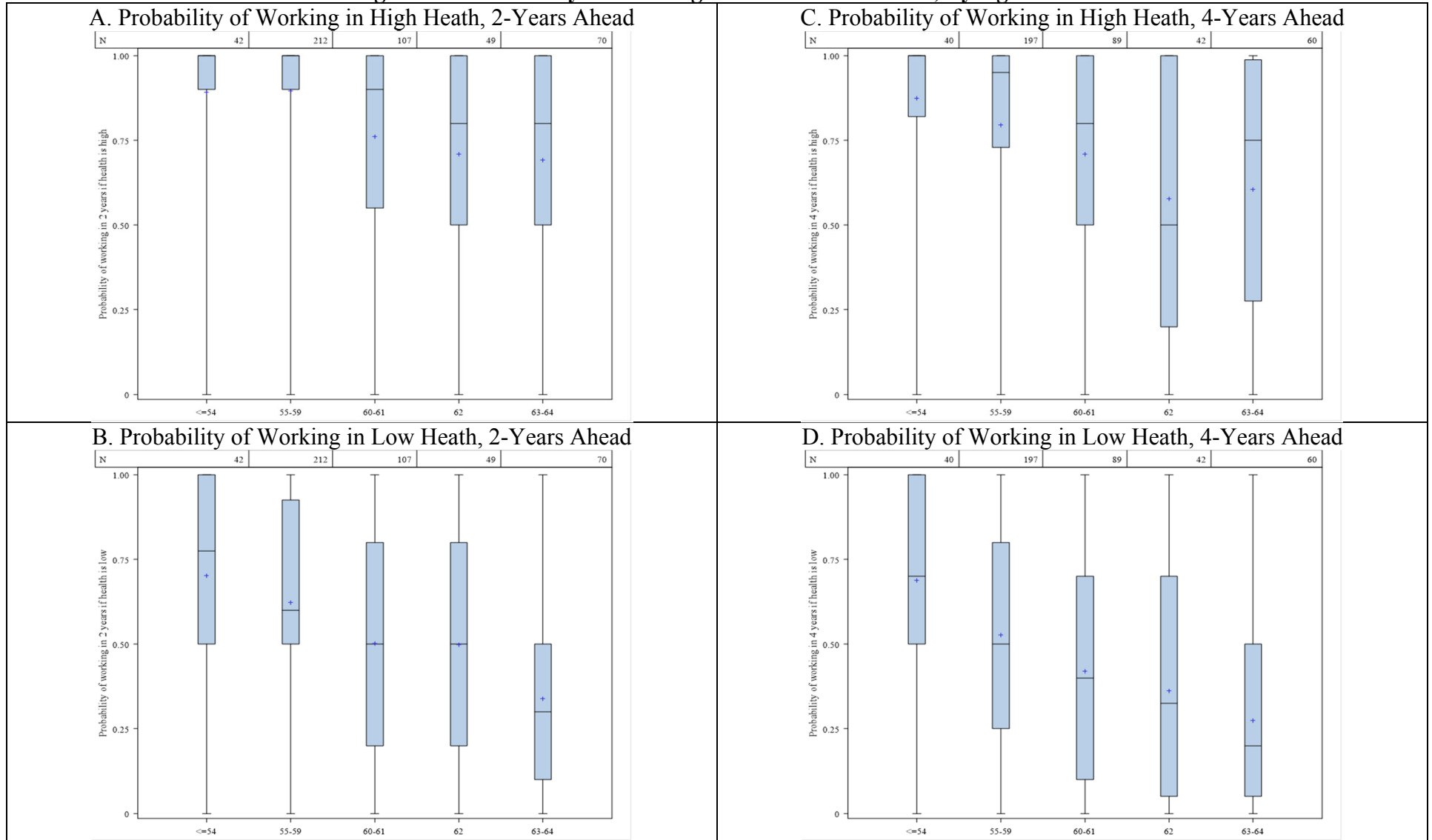|	2-Year Ahead S*ea*TE	4-Year Ahead S*ea*TE
Constant	-0.184***	-0.214***
	(0.056)	(0.060)
Age		
60-61	-0.005	-0.036
	(0.033)	(0.037)
62	0.037	0.054
	(0.044)	(0.049)
63-64	-0.106***	-0.071
	(0.039)	(0.043)
Gender		
Female	-0.045	-0.017
	(0.028)	(0.030)
Education		
Some college	-0.029	-0.081*
	(0.041)	(0.047)
College grad	-0.033	-0.076*
	(0.036)	(0.040)
Other adv. degree	-0.086**	-0.080*
	(0.043)	(0.046)
Marital status		
Partnered	-0.046	-0.050
	(0.036)	(0.039)
Spouse's work status		
Working	-0.014	0.026
	(0.033)	(0.036)
Total HH wealth		
First quintile	0.077*	0.086*
	(0.045)	(0.050)
Second quintile	-0.008	0.0009
	(0.045)	(0.050)
Third quintile	-0.010	0.027
	(0.044)	(0.048)
Fourth quintile	0.021	0.064
	(0.042)	(0.045)
Current salary		
First quintile	0.007	0.028
	(0.047)	(0.052)
Second quintile	-0.069	-0.034
	(0.044)	(0.048)
Third quintile	0.023	-0.007
	(0.044)	(0.047)
Fourth quintile	-0.002	-0.023
	(0.042)	(0.045)
Observations	438	391
R^2	0.0717	0.0566

Note: *** significant at 1%, ** significant at 5%, * significant at 10%

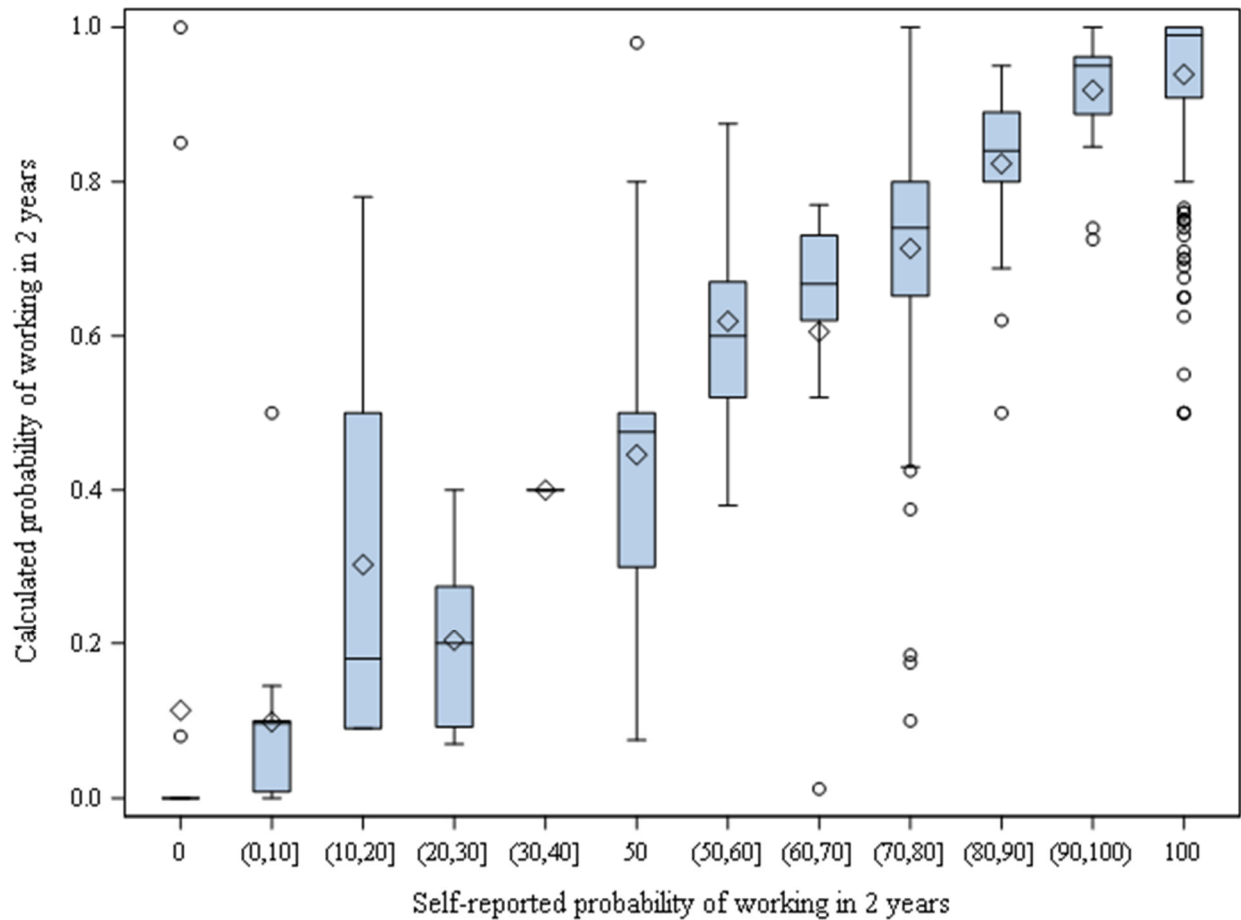**Figure B1. Unconditional Probability of Low Health and Working, By Age: HRS**
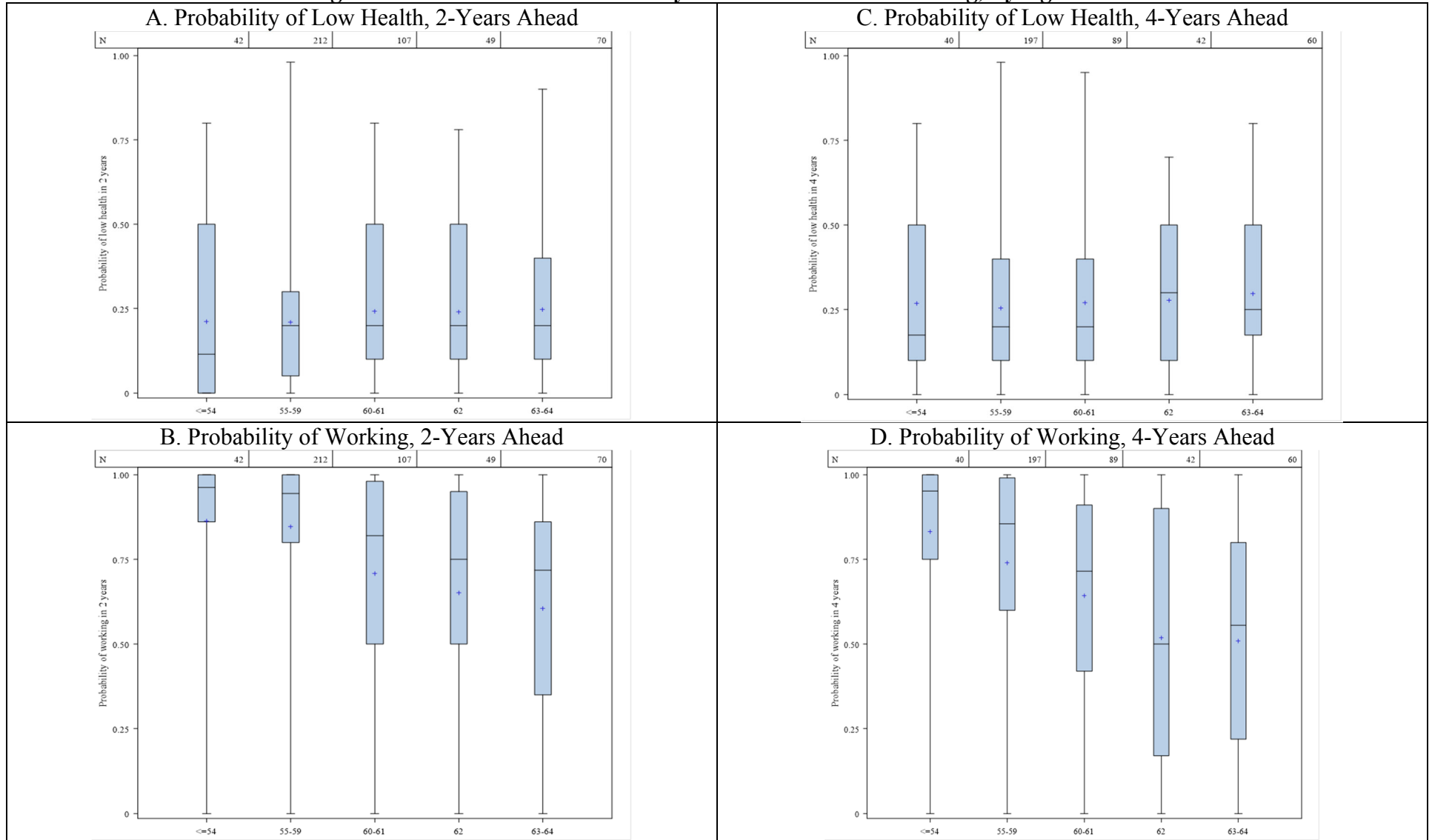
Note: Box and whiskers plots of the distribution of unconditional probability of low health and work 2- and 4-years ahead. The "+" is the mean, the mid-line is the median, and the box shows inter-quartile range. Age is as of time of the survey.

Figure B2. Probability of Working Conditional on Health, By Age: HRS

A. Probability of Working in High Heath, 2-Years Ahead

C. Probability of Working in High Heath, 4-Years Ahead

B. Probability of Working in Low Heath, 2-Years Ahead

D. Probability of Working in Low Heath, 4-Years Ahead

Note: Box and whiskers plots of the distribution of probability of work given health 2- and 4-years ahead. The "+" is the mean, the mid-line is the median, and the box shows inter-quartile range. Age is as of time of the survey.

Figure B3. Do Respondents Apply the Law of Total Probability? HRS

Note: Figure shows the distribution of responses for the unconditional probability of working in 2 years computed using the law of total probability (on the vertical axis) versus the self-reported reported unconditional probability of working in 2 years (on the horizontal axis). The correlation between the two measures is 0.873.

Appendix C. Survey Instrument

The following questions are from the Vanguard Research Initiative Survey 4. For the complete survey instrument, see http://ebp-projects.isr.umich.edu/VRI/survey_overview.html. The values of the "health fill" variables are given in the table below.

Next we would like to ask your opinion about how likely you think various events might be. Please give a number from 0 to 100 percent, where 0 means that you think there is absolutely no chance, and 100 means that you think the event is absolutely sure to happen.

Q110   Please think about work in general and not just any work you may be doing now. What are the chances that you will be working for pay two years from now?
      [fill in box]% [Allow 0-100]

Q111   Would you say your health is excellent, very good, good, fair, or poor?

      Excellent
      Very good
      Good
      Fair
      Poor

Q112   What are the chances that your health will be {*Health fill 1*} two years from now?
      [fill in box]% [Allow 0-100]

Q113   And what are the chances that your health will be {*Health fill 2*} two years from now?
      [fill in box]% [Allow 0-100]

Q114   If your health is {*Health fill 3*} two years from now, what are the chances that you will be working for pay?
      [fill in box]% [Allow 0-100]

Q115   And if your health is {*Health fill 4*} two years from now, what are the chances that you will be working for pay?
      [fill in box]% [Allow 0-100]

Q116   And if your health is {*Health fill 5*} two years from now, what are the chances that you will be working for pay?
      [fill in box]% [Allow 0-100]

[If no answer given in all of Q114, Q115 and Q116, skip to logic immediately before Q122.
 If Q**114**=0, Q**115**=0 and Q**116**=0, skip to logic immediately before Q**122**.]

Q117   Now please think about four years from now. What are the chances that your health will be {*Health fill 1*} four years from now?
      [fill in box]% [Allow 0-100]

Q118   And what are the chances that your health will be {*Health fill 2*} four years from now?
        [fill in box]% [Allow 0-100]

Q119   If your health is {*Health fill 3*} four years from now, what are the chances that you will be working for pay?
        [fill in box]% [Allow 0-100]

Q120   And if your health is {*Health fill 4*} four years from now, what are the chances that you will be working for pay?
        [fill in box]% [Allow 0-100]

Q121   And if your health is {*Health fill 5*} four years from now, what are the chances that you will be working for pay?
        [fill in box]% [Allow 0-100]

[TABLES OF "FILL" VARIABLES]

Self-rated health, Q111	Health fill 1	Health fill 2	Health fill 3	Health fill 4	Health fill 5
Excellent	Worse	fair or poor	Excellent	very good or good	fair or poor
Very good	Worse	fair or poor	very good or excellent	good	fair or poor
Good, DK, RF	fair or poor	very good or excellent	very good or excellent	good	fair or poor
Fair	about the same or worse	very good or excellent	very good or excellent	good	fair or poor
Poor	about the same or worse	very good or excellent	very good or excellent	fair or good	poor