



Inequities in the Golden Years: How Wealth Shapes Healthy and Work-Free Life

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Motivation/preview

- Well-known result that income correlates with longer lives – not known whether these additional years are healthy or extended sick states (Chetty, et al., 2016; Chernenov, et al., 2017)
- We analyze cohorts turning 65 a decade apart to examine life expectancy, healthy (disability-free) life expectancy, and work patterns
- We find that the wealthiest do live longer, healthier lives – these additional years are used to work longer, though they still retain more years work-free than the least wealthy
- Patterns inform retirement, Social Security progressivity, health inequality (Auerbach, et al., 2017; Hudomiet, et al., 2021)

Research Questions

1. What is the impact of wealth on healthy life expectancy? (within-cohort disability-free life expectancy, or DFLE)
2. How are the wealth gaps in healthy life expectancy changing over time? (DFLE changes between cohorts turning 65 a decade apart)
3. How is work shaped by in the wealth inequality in healthy life expectancy? (do the wealthy work more or have more “work-free” life expectancy, WFLE)

Health and Retirement Study (HRS) Data

- Panel data (1996-2018) on health, wealth, financial literacy, and work of older individuals in the US – surveys every two years
- Disability will be defined as a limitation in any Activity of Daily Living – e.g., needing help bathing, eating, moving around, etc.
- Work will be defined as doing any paid work

Basic methodology is to first calculate life expectancy, then multiply each year alive with probability of disability; or probability of working; thus need good life expectancy measures.

The NCHS & SSA age-sex life tables help us extend the life expectancy measures beyond what we observe in the HRS

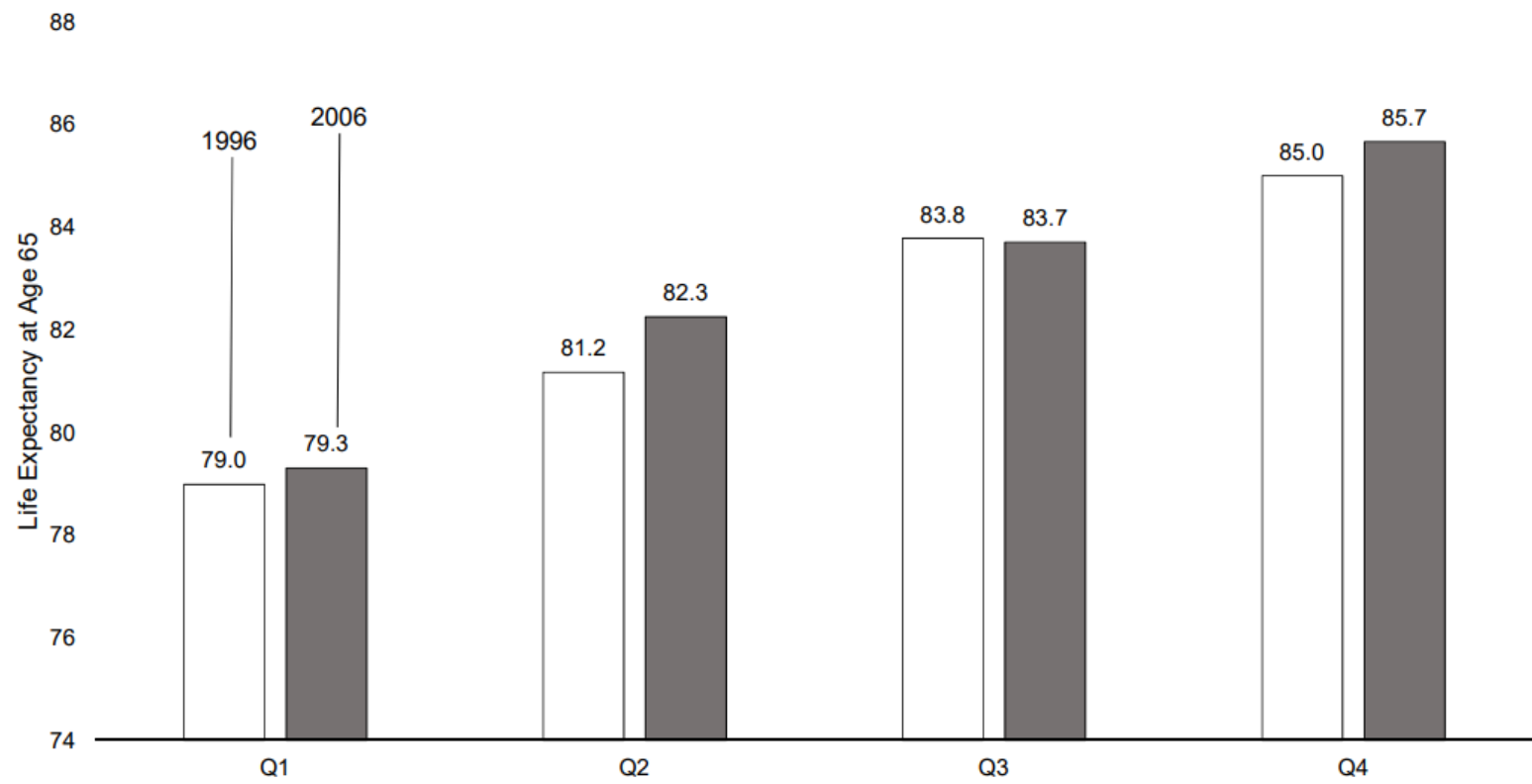
Methodology

- Compare cohorts turning 65 in 1996 vs. 2006
- Calculate life expectancy following Chetty, et al. (2016)
 - Estimates differentiated by age-sex; leverage log-linear relationship of mortality and age (Gompertz approximation) for ages 79-89
- Calculate DFLE following Chernew, et al. (2017)
 - Product of two components: life expectancy and disability prevalence
 - Disability prevalence given by the following regression:

$$\begin{aligned} Disability_{i,t} = & \alpha + \sum_{j=2}^4 \theta_{j,1996} WealthQ_i + \delta Cohort2006_i \\ & + \sum_{j=2}^4 \theta_{j,2006} WealthQ_i \times Cohort2006_i + \gamma Demographics_{i,t} + \epsilon_{i,t} \end{aligned}$$

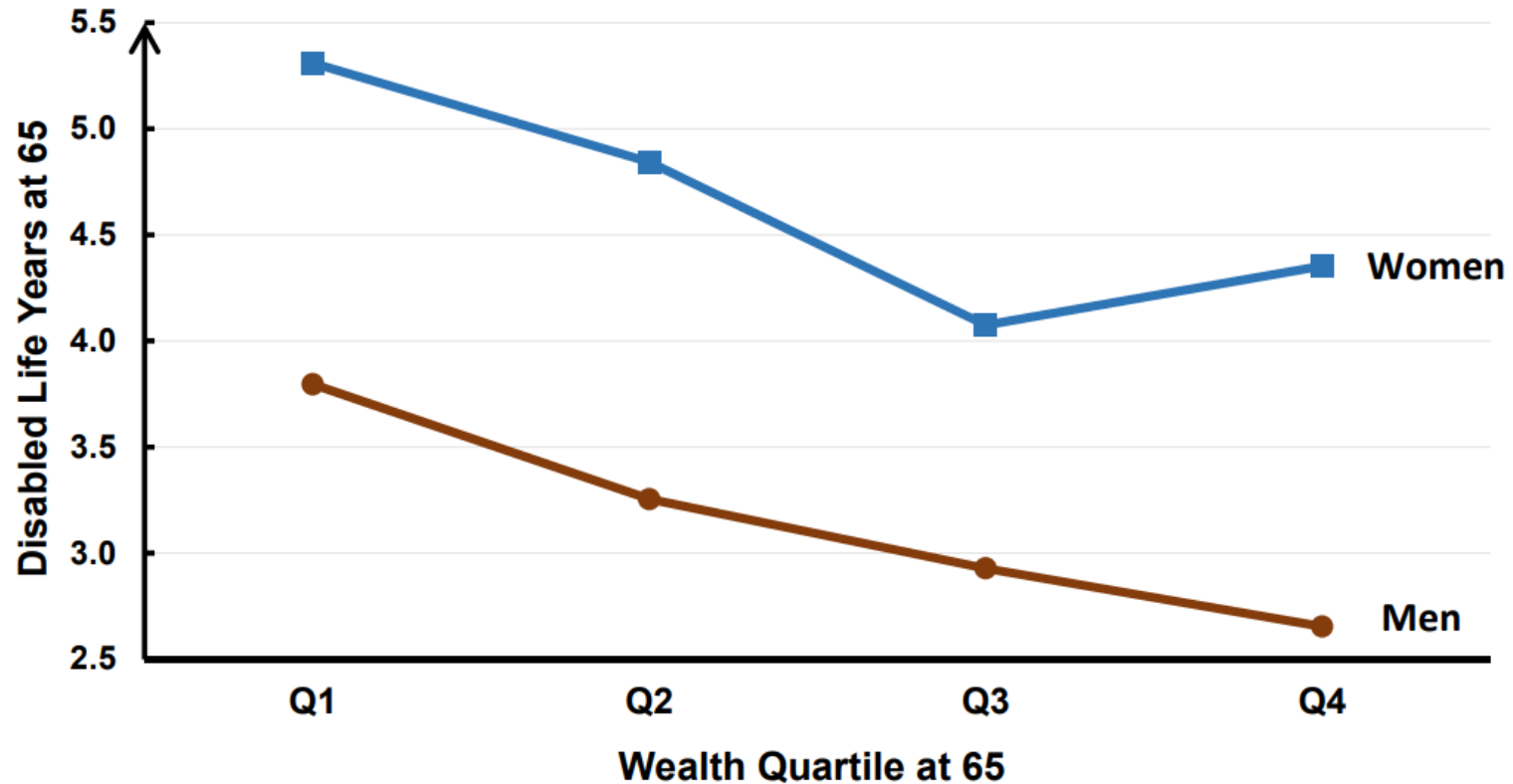
- Calculate WFLE in a parallel manner
- Wealth quartile is gender-specific

Results: Male Life Expectancy at Age 65 – larger gains for wealthiest



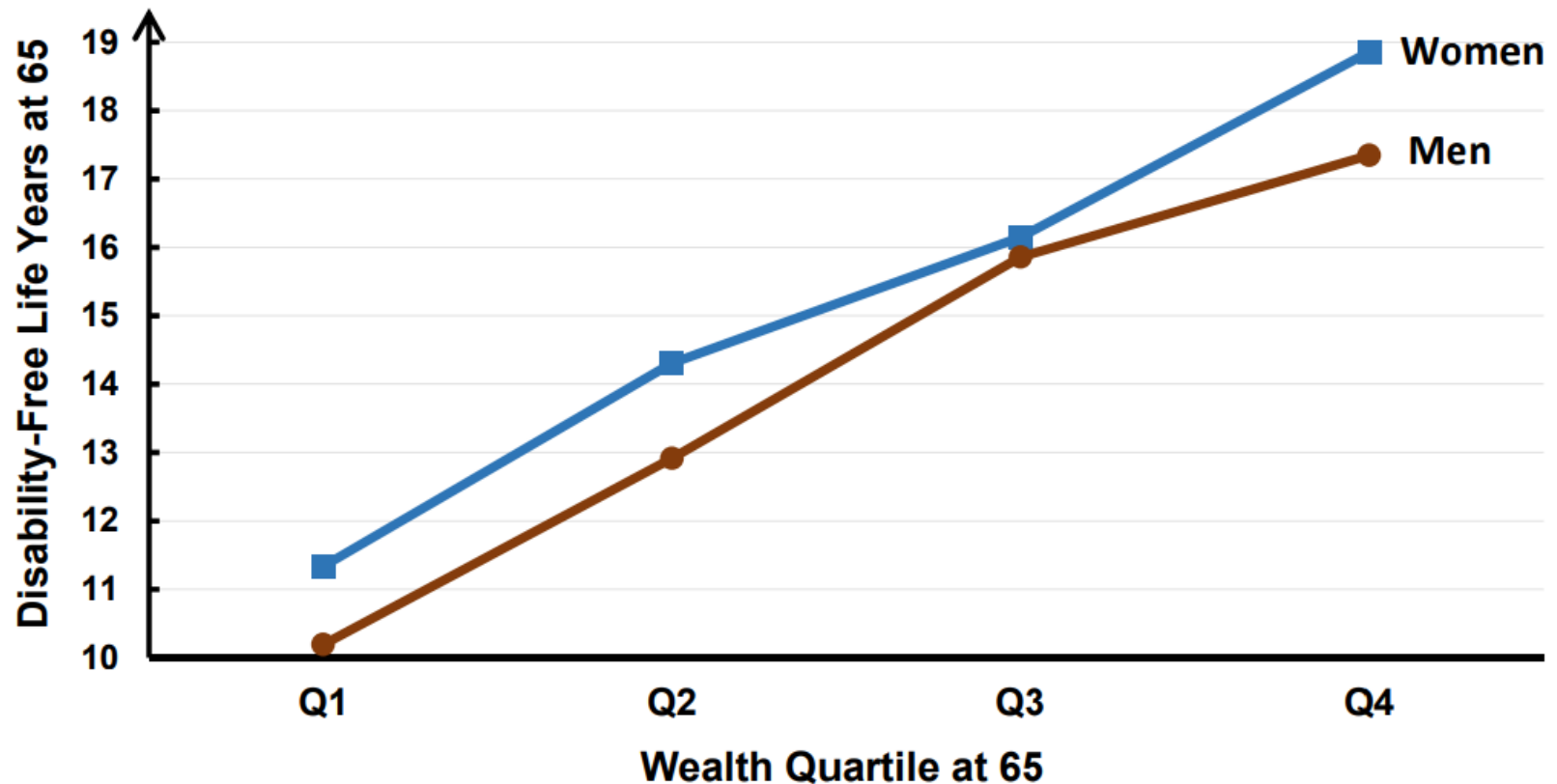
(Source: HRS data 1996-2018 through age 89, NCHS data for ages 90-99, and SSA data for ages 100+. Not shown: results for women.)

Within-Cohort Results: Disabled Life Years – least wealthy have most disabled life years



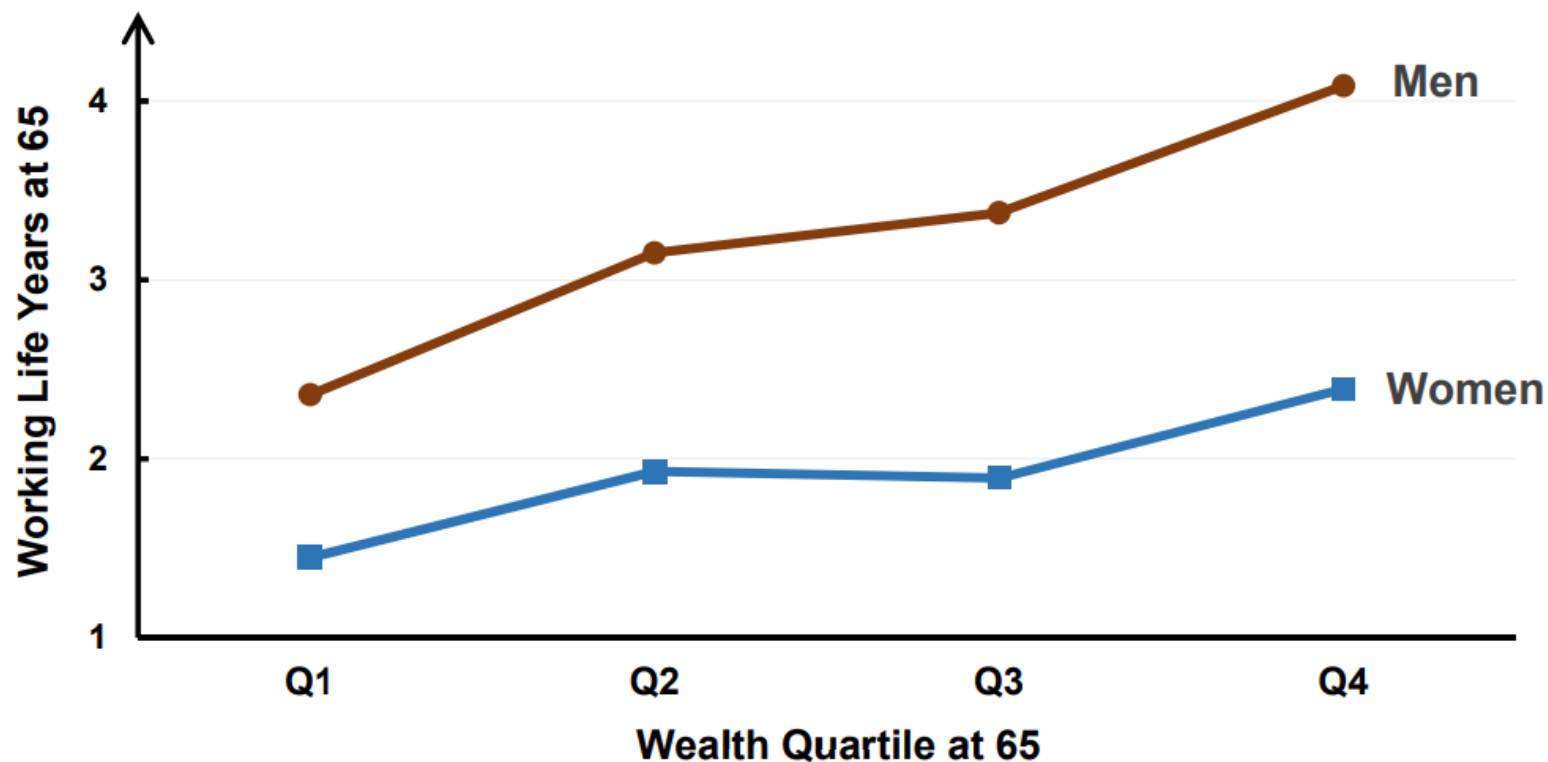
(Source: HRS respondents aged 64-66 in 1996 and 2006 (for disability and life expectancy through age 89), plus SSA and NCHS for life expectancy after age 90.)

Within-Cohort Results: Disability-Free Life Years – these are increasing with wealth



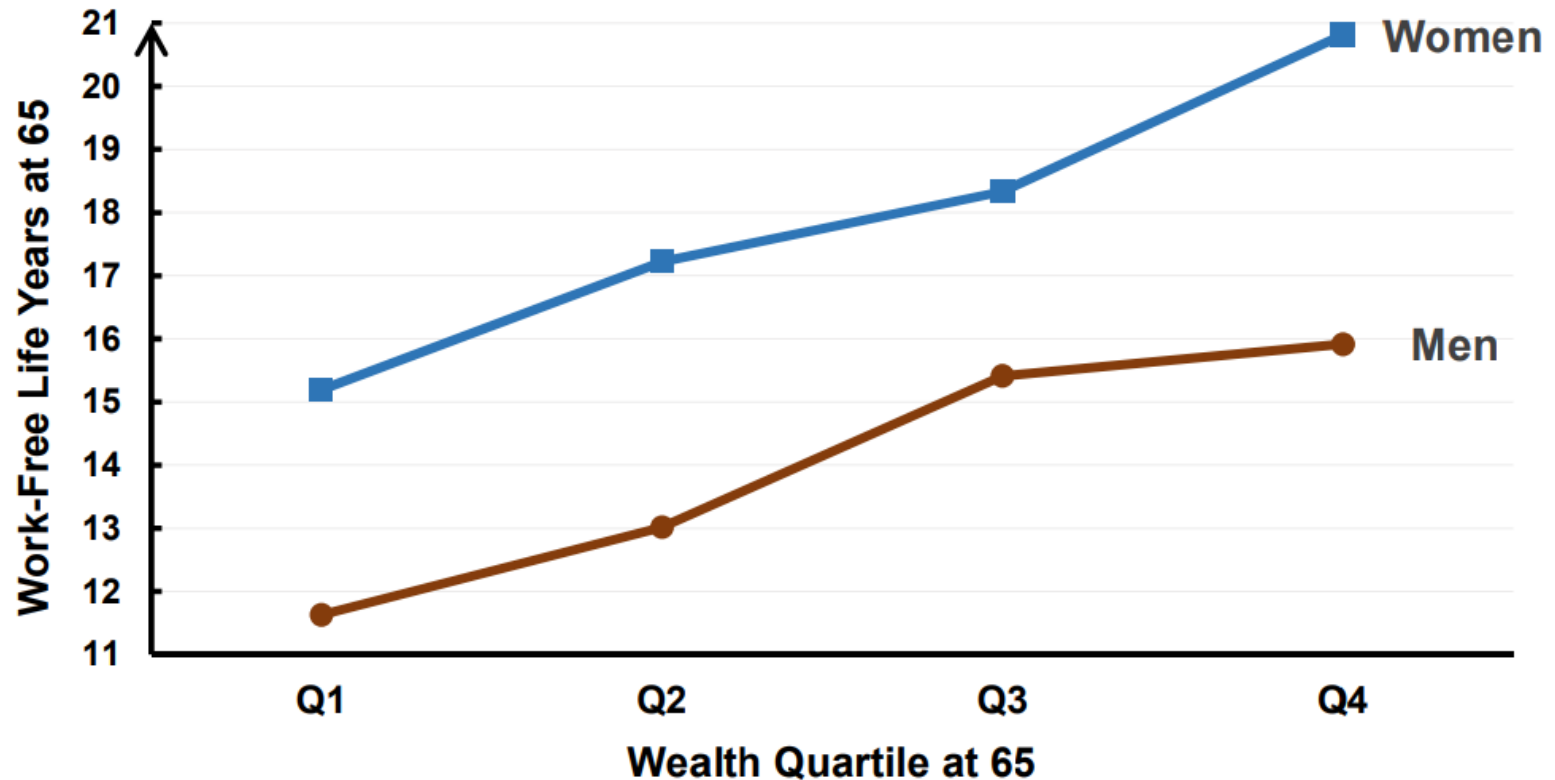
(Source: HRS respondents aged 64-66 in 1996 and 2006 (for disability and life expectancy through age 89), plus SSA and NCHS for life expectancy after age 90.)

Within-Cohort Results: Working Life Years – wealthiest work more years



(Source: HRS respondents aged 64-66 in 1996 and 2006 (for work and life expectancy through age 89), plus SSA and NCHS for life expectancy after age 90.)

Within-Cohort Results: Work-Free Life Years – concentrated among wealthiest



(Source: HRS respondents aged 64-66 in 1996 and 2006 (for work and life expectancy through age 89), plus SSA and NCHS for life expectancy after age 90.)

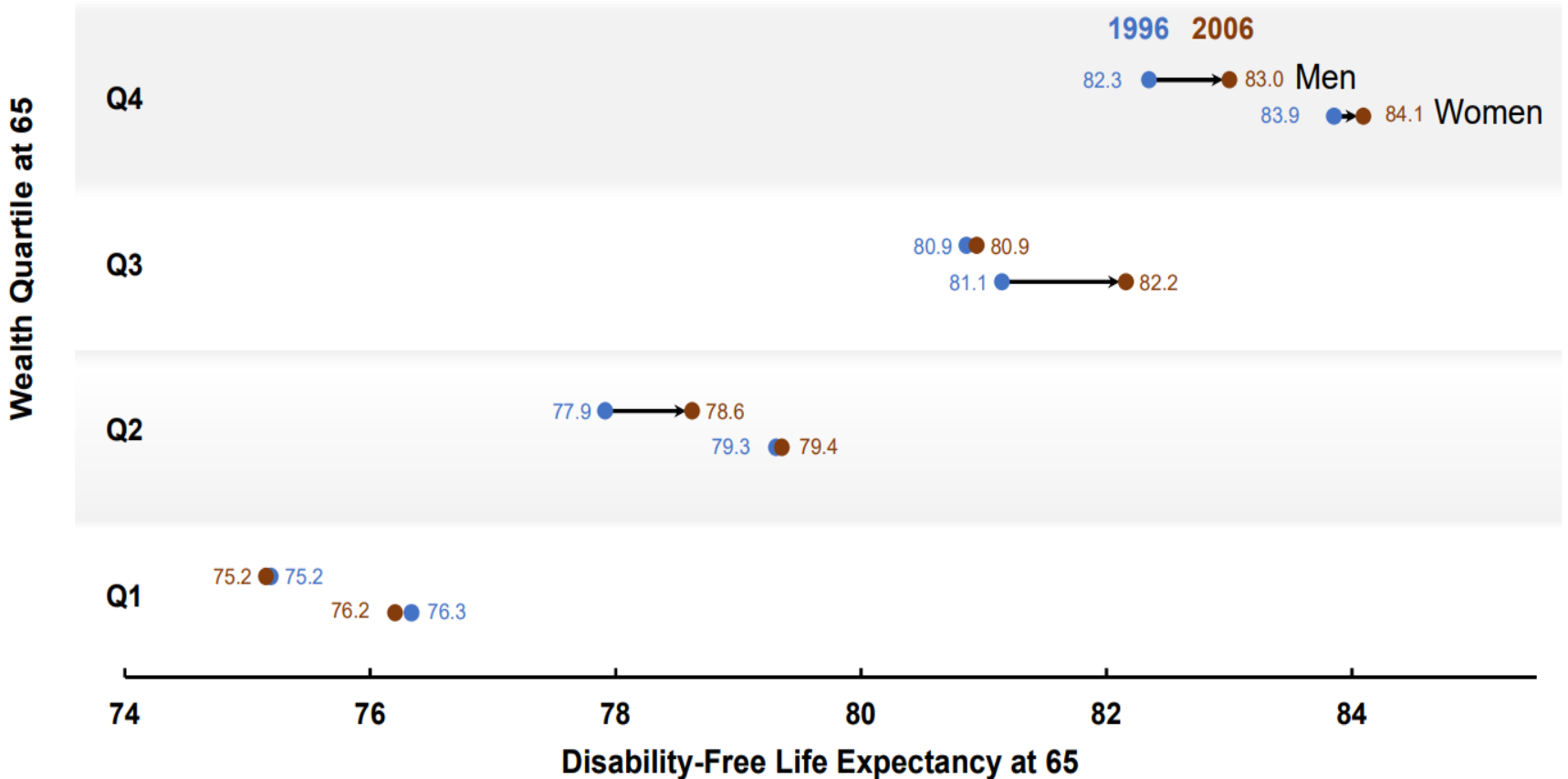
Regression Results - Disability

Dependent variable: Disabled this wave?

WealthQ	θ	2006*WealthQ	θ
2	-0.0631^{***} (0.0119)	2	-0.0144 (0.0156)
3	-0.106^{***} (0.0111)	3	-0.0387^{***} (0.0140)
4	-0.124^{***} (0.0108)	4	-0.0420^{***} (0.0137)
		2006 Cohort	0.029^{**} (0.0121)
<i>Reference Group Mean</i>		0.2430	
<i>N</i>		30,426	

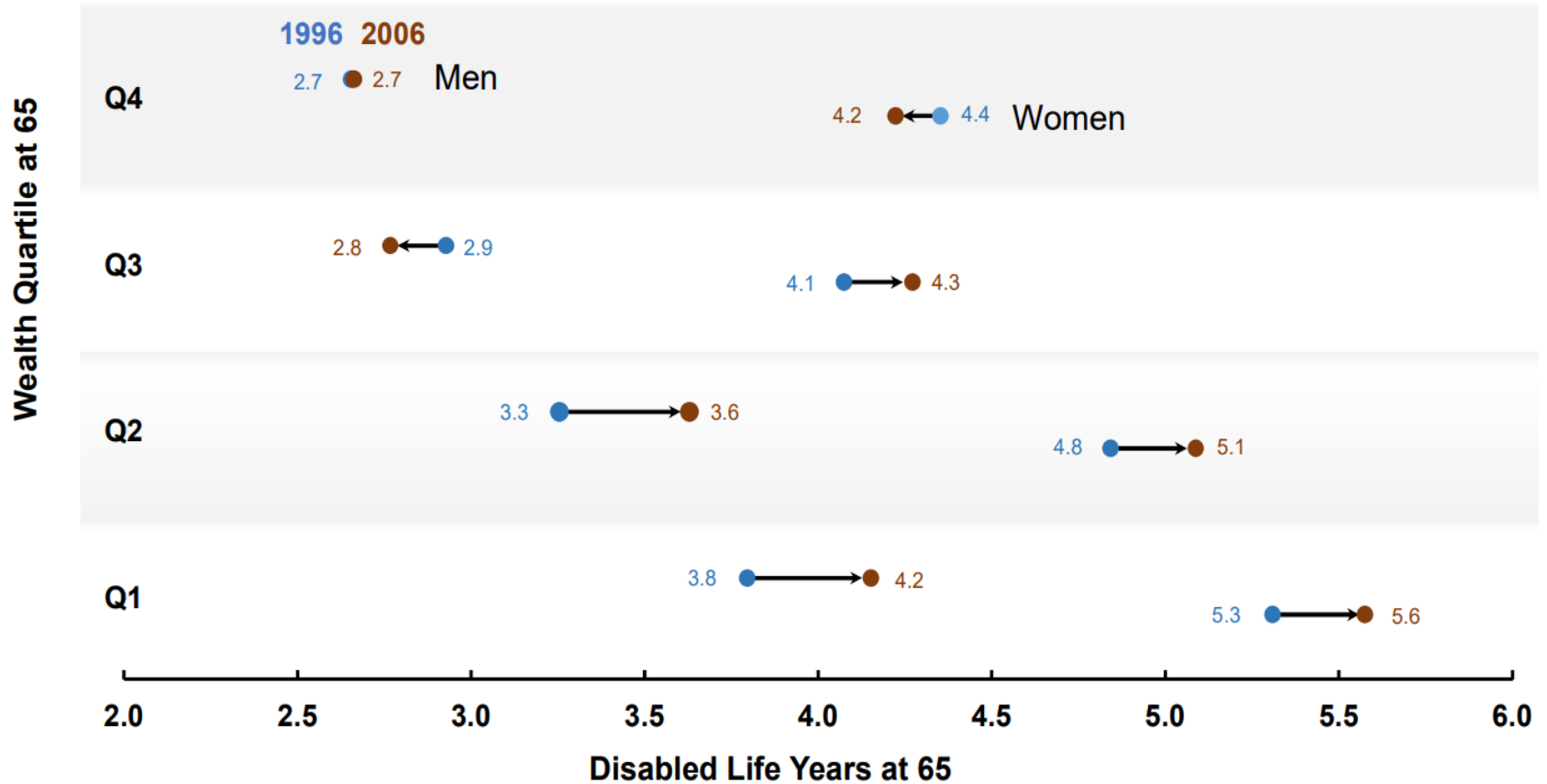
Notes: ** $p < 0.05$, *** $p < 0.01$. Not shown: age-gender, race, ethnicity, and time-until-death dummies. (Source: HRS respondents aged 64-66 in 1996 & 2006)

Between-Cohort Results: Disability-Free Life Expectancy



(Source: HRS respondents aged 64-66 in 1996 and 2006 (for disability and life expectancy through age 89), plus SSA and NCHS for life expectancy after age 90.)

Between-Cohort Results: Disabled Life Years



(Source: HRS respondents aged 64-66 in 1996 and 2006 (for disability and life expectancy through age 89), plus SSA and NCHS for life expectancy after age 90.)

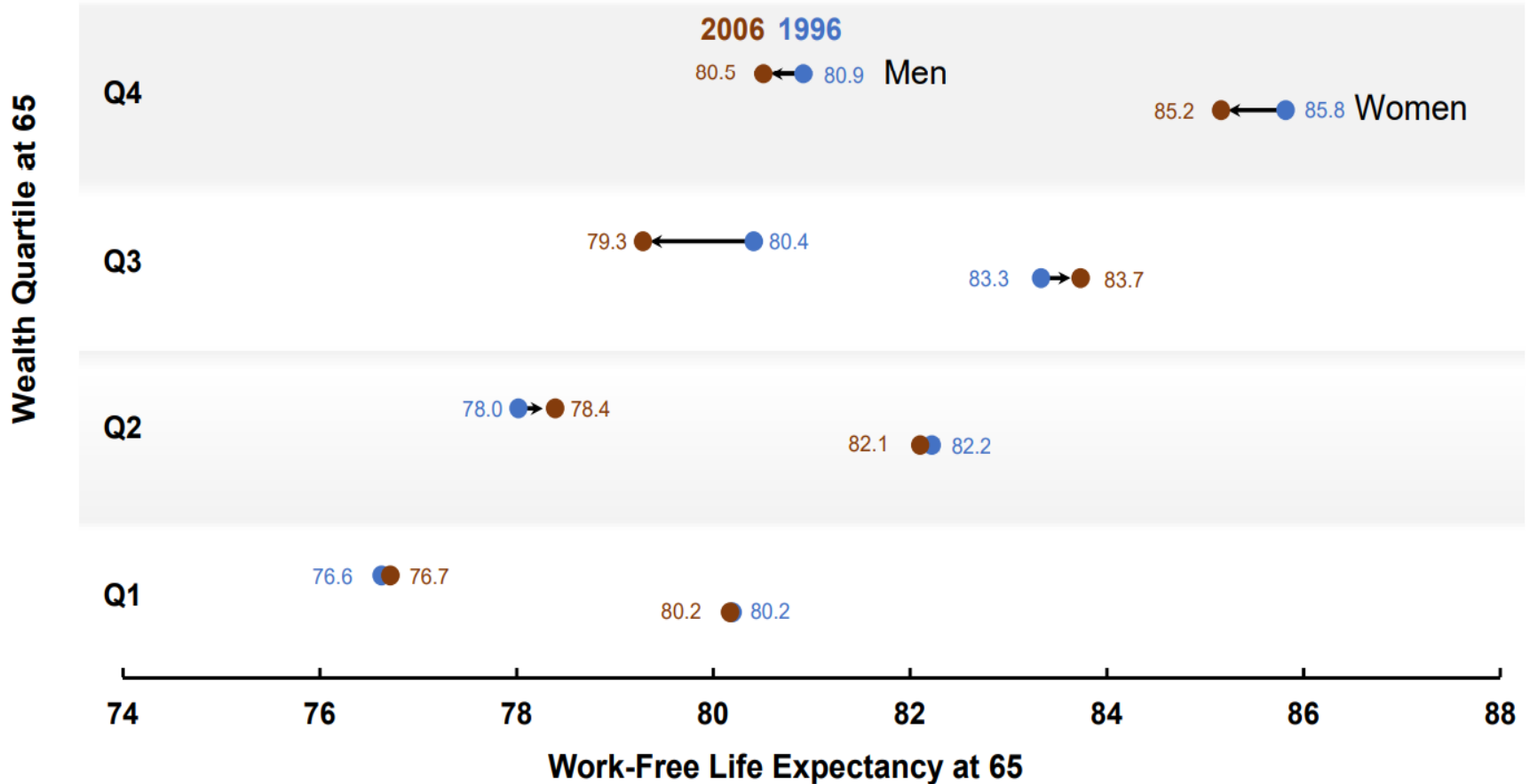
Regression Results - Work

Dependent variable: Working this wave?

WealthQ	θ	2006*WealthQ	θ
2	0.0277** (0.0114)	2	0.0420*** (0.0162)
3	0.00640 (0.0110)	3	0.0788*** (0.0157)
4	0.0381*** (0.0110)	4	0.0820*** (0.0154)
		2006 Cohort	0.0121 (0.0122)
<i>Reference Group Mean</i>		0.2231	
<i>N</i>		30,398	

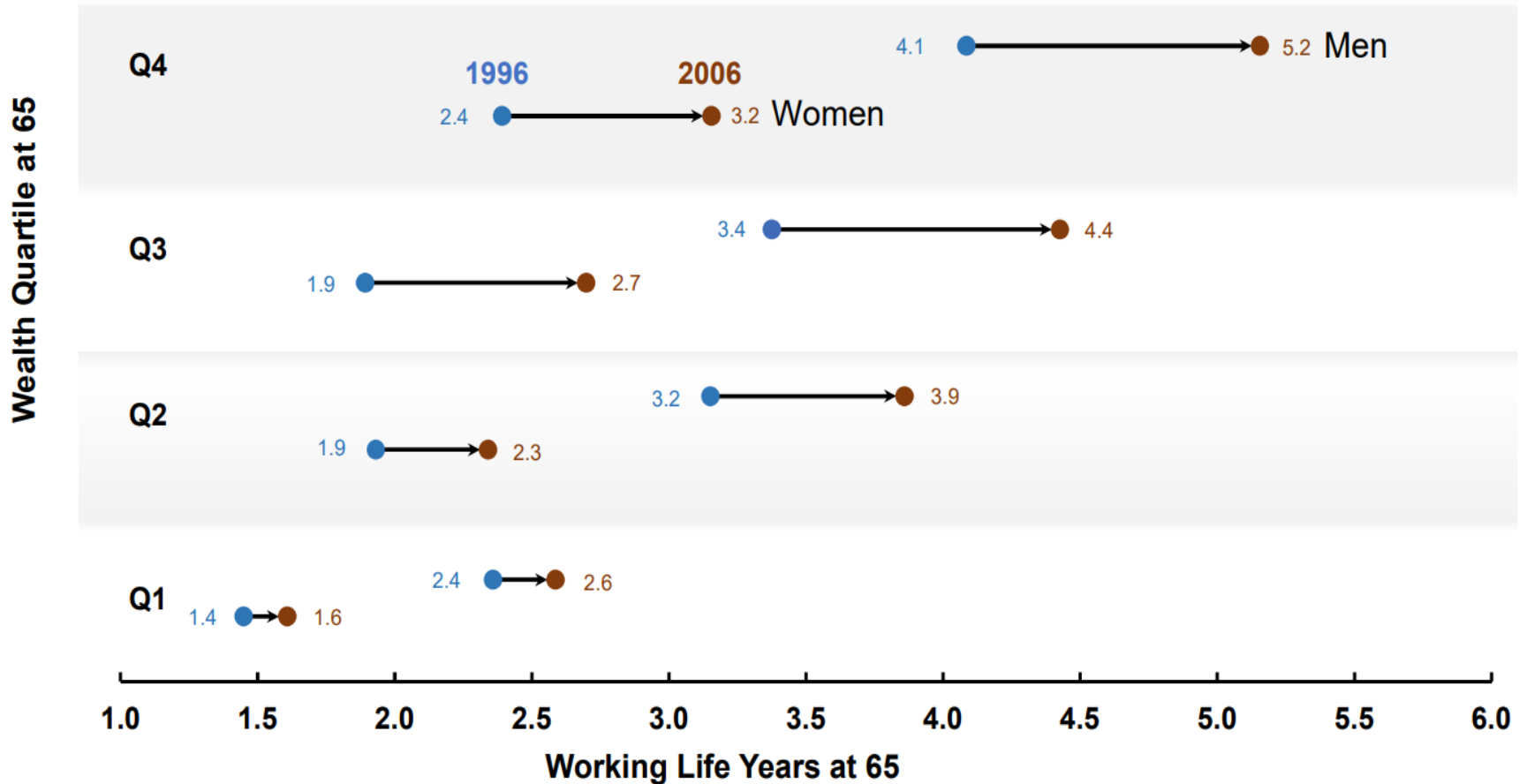
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Between-Cohort Results: Work-free life expectancy



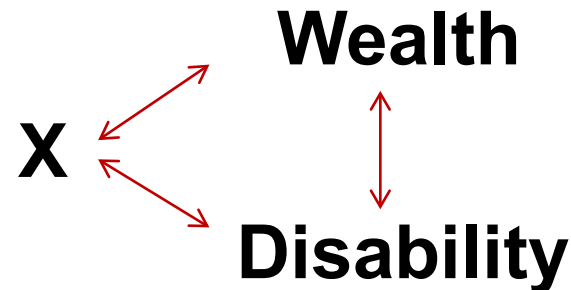
(Source: HRS respondents aged 64-66 in 1996 and 2006 (for work and life expectancy through age 89), plus SSA and NCHS for life expectancy after age 90.)

Between-Cohort Results: Working life years



(Source: HRS respondents aged 64-66 in 1996 and 2006 (for work and life expectancy through age 89), plus SSA and NCHS for life expectancy after age 90.)

Caveat: Interpretation of Results



- Simultaneity of health and wealth; linkages between early-life conditions and later health (Meara, et al., 2008)
- Two approaches to reduce concern:
 1. Examine education instead of wealth as the differentiator – education is harder to “spend down”, more likely to be fixed for large period of life
 2. Examine effect of wealth quartiles on health at “arrival” to age 65 – see if this is different for the 1996 versus 2006 cohort. If not, then we may be more sure that the quartiles are not capturing cohort changes in the health-wealth relationship

Results – Replacing Wealth with Education

	(1) Disabled?	(2) Working?
Education Quartile 2	-0.0617*** (0.00882)	0.0574*** (0.00814)
Education Quartile 3	-0.0922*** (0.00952)	0.0800*** (0.00979)
Education Quartile 4	-0.0752*** (0.00981)	0.103*** (0.00992)
2006 Cohort	0.0395*** (0.0102)	-0.0178* (0.00968)
Education Quartile 2, 2006	-0.0343*** (0.0123)	0.0676*** (0.0127)
Education Quartile 3, 2006	-0.0140 (0.0131)	0.0755*** (0.0145)
Education Quartile 4, 2006	-0.0655*** (0.0128)	0.127*** (0.0145)
Race/Ethnicity	✓	✓
Age-Gender Interactions	✓	✓
Died next wave?	✓	✓
Reference Group Mean	0.2240	0.1833
Observations	34821	34791
R ²	0.0573	0.207

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

(Source: HRS respondents aged 64-66 in 1996 & 2006)

Results – Changing Outcome to Health at Age 65

	(1) Self-Reported Health	(2) Doctor Visits	(3) Hospital Visits
Wealth Quartile 2	-0.291*** (0.0924)	-0.134 (1.563)	-0.336*** (0.118)
Wealth Quartile 3	-0.564*** (0.0927)	-2.568*** (0.879)	-0.377*** (0.118)
Wealth Quartile 4	-0.804*** (0.0906)	-2.355** (1.069)	-0.457*** (0.113)
2006 Cohort	0.165* (0.0908)	2.057 (1.371)	-0.0764 (0.165)
Wealth Quartile 2, 2006	0.0312 (0.126)	0.273 (2.170)	0.179 (0.183)
Wealth Quartile 3, 2006	-0.111 (0.122)	0.0597 (1.551)	0.0419 (0.175)
Wealth Quartile 4, 2006	-0.0632 (0.116)	0.143 (1.673)	0.0845 (0.171)
Race/Ethnicity	✓	✓	✓
Age-Gender Interactions	✓	✓	✓
Died next wave?	✓	✓	✓
Reference Group Mean	3.1148	9.7456	0.6951
Observations	3348	3245	3339
R ²	0.141	0.0508	0.0480

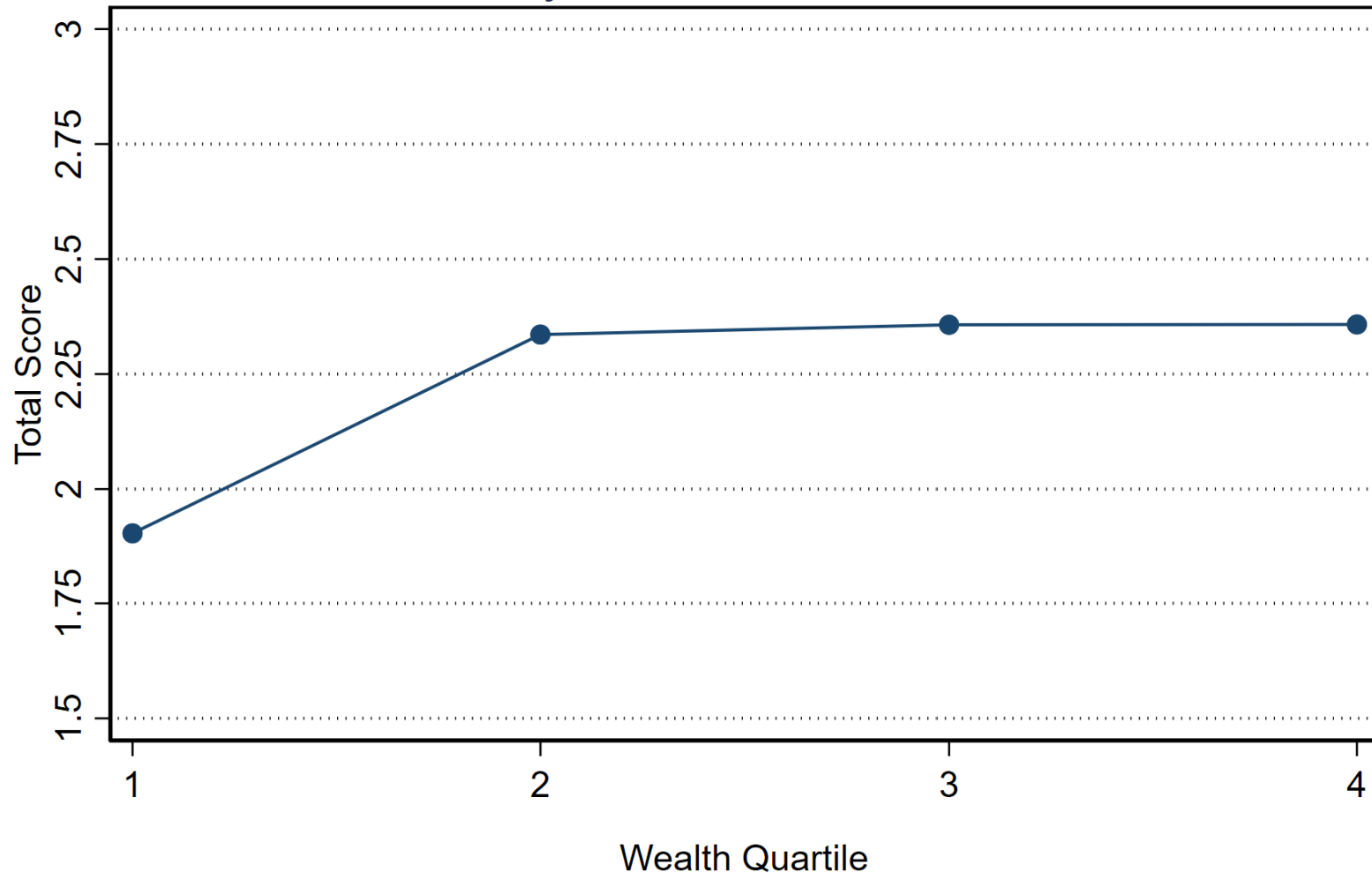
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 (Source: HRS respondents aged 64-66 in 1996 & 2006)

Next steps of the project

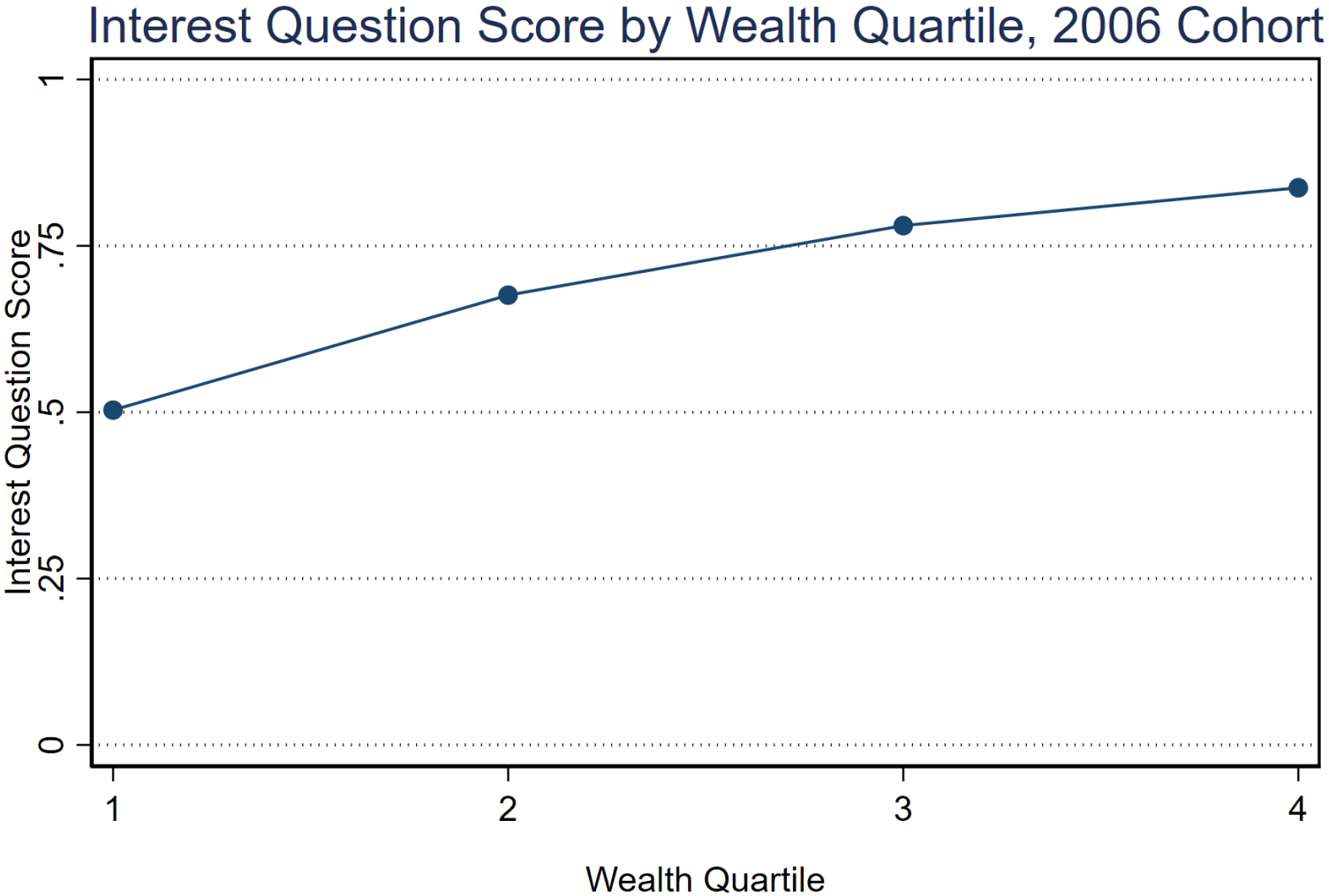
- *Why* does wealth correlate with later life health & work?
- First step (today): look at correlations of wealth and financial literacy – there is much prior literature, but can try to understand financial and health literacy better

Financial literacy and wealth – the lowest wealth quartile has a lower score ($p < 0.01$)

Total Score by Wealth Quartile, 2006 Cohort



Financial literacy and wealth – wealthier answer interest rate Q more correctly ($p < 0.05$)



Conclusions

- Wealth gaps in life expectancy, healthy years, years of work, and also years retaining *work-free* exist and are growing
- Does not appear to be driven by the health-wealth relationship prior to age 65
- Specifically:
 - Healthy life expectancy at age 65 grew by 4% over a recent decade for the wealthiest, no change for least wealthy
 - Work-free life expectancy at age 65 decreased by 3% over a recent decade for the wealthiest, increased by 0.7% for least wealthy



Thank you!

Disability: Holding Wealth Inequality Fixed at 1996 Levels

Dependent variable: Disability this wave?

WealthQ	$\theta_{Original}$	θ_{Fixed}	2006*WealthQ	$\theta_{Original}$	θ_{Fixed}
2	-0.0631*** (0.0119)	-0.0777*** (0.0109)	2	-0.0144 (0.0156)	-0.00184 (0.0144)
3	-0.106*** (0.0111)	-0.107*** (0.0127)	3	-0.0387*** (0.0140)	-0.00437 (0.0162)
4	-0.124*** (0.0108)	-0.123*** (0.0108)	4	-0.0420*** (0.0137)	-0.0341** (0.0135)
			2006 Cohort	0.029** (0.0121)	0.0228* (0.0121)
<i>Reference Group Mean</i>			0.2430		
<i>N</i>			30,426		

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Not shown: age-gender and time-until-death dummies. (Source: HRS respondents aged 64-66 in 1996 & 2006)

Work: Holding Wealth Inequality Fixed at 1996 Levels

Dependent variable: Working this wave?

WealthQ	$\theta_{Original}$	θ_{Fixed}	2006*WealthQ	$\theta_{Original}$	θ_{Fixed}
2	0.0277** (0.0114)	0.0192* (0.0103)	2	0.0420*** (0.0162)	0.0264* (0.0149)
3	0.00640 (0.0110)	0.00651 (0.0147)	3	0.0788*** (0.0157)	0.105*** (0.0207)
4	0.0381*** (0.0110)	0.0377*** (0.0110)	4	0.0820*** (0.0154)	0.0636*** (0.0150)
			2006 Cohort	0.0121 (0.0122)	0.0199 (0.0122)
<i>Reference Group Mean</i>			0.2231		
<i>N</i>			30,398		

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Not shown: age-gender and time-until-death dummies. (Source: HRS respondents aged 64-66 in 1996 & 2006)