The Mortality Effects of Retirement: Evidence from Social Security Eligibility at Age 62

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Funded by grants from the Alfred P. Sloan Foundation's Working Longer Program and the Steven H. Sandell Grant in Retirement Research sponsored by the SSA and the Center for Retirement Research at Boston College.

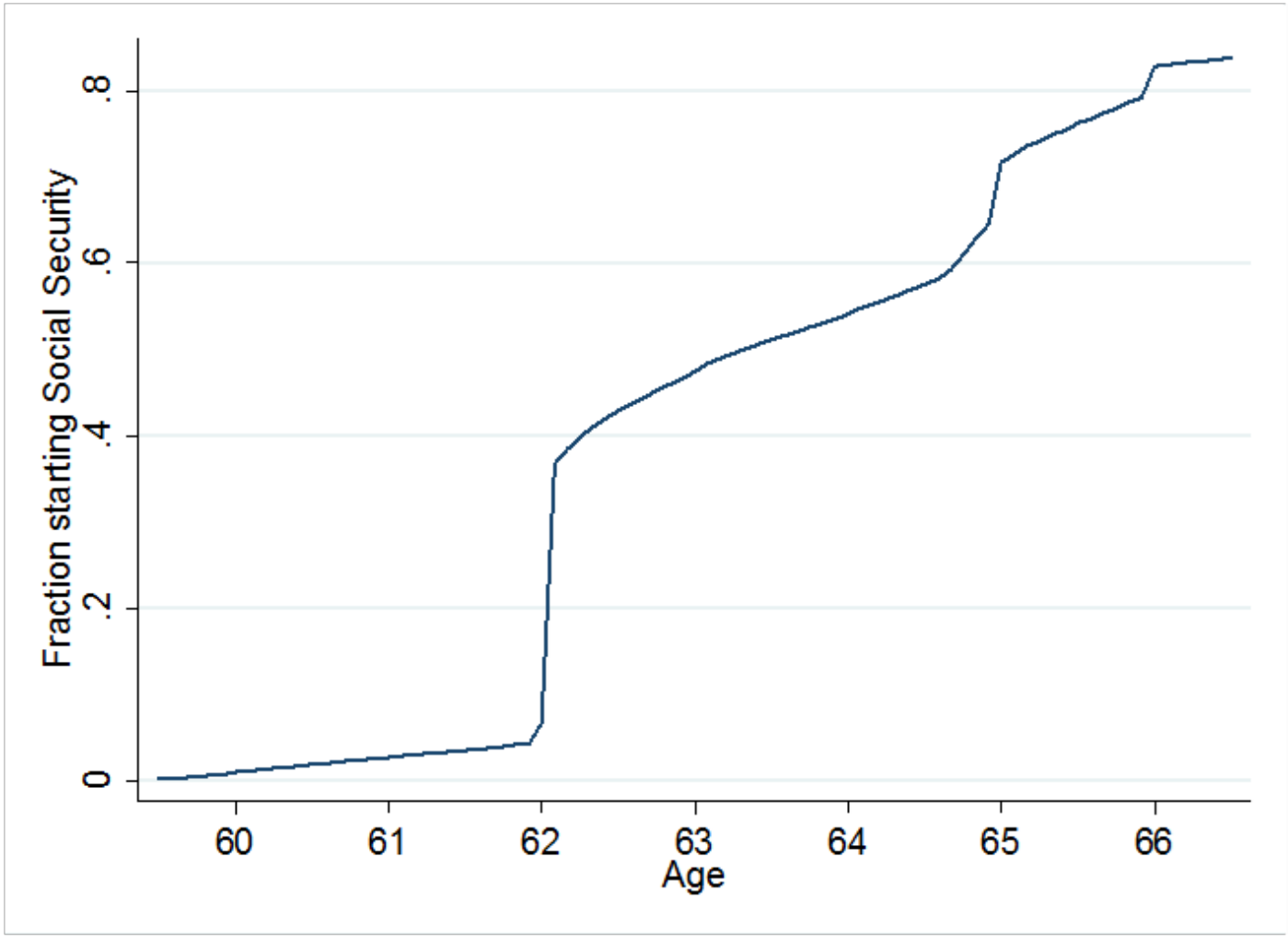
Introduction

- Huge interest in health effects of retirement
  - Understand implications of population aging
  - Evaluate proposed reforms to retirement policies
- Empirical challenge: health and retirement are jointly determined
  - Individuals in poor health are likely to retire earlier
- Our research question: Is mortality affected by the availability of Social Security at 62?

Social Security Eligibility at Age 62

- 62 is the earliest age for Retirement Insurance
- Workers claiming at 62 receive 75-80% of their Primary Insurance Amount (PIA)
  - Compared to 100% at Full Retirement Age (FRA)
  - Ave. monthly payments: ~$1200 (men), ~$900 (women)
- Large fraction of population claim at 62
  - Nearly 40% of people claim within 4 months of age 62

Cumulative Rate of New Social Security Claims, Ages 59 to 67



Note: We use birth cohorts from 1921 to 1948 and include new claims by both workers and dependents for the Disability, Retirement and Survivors components of Social Security. Sources are 1% extract of Master Beneficiary Record and population data from Current Population Survey.

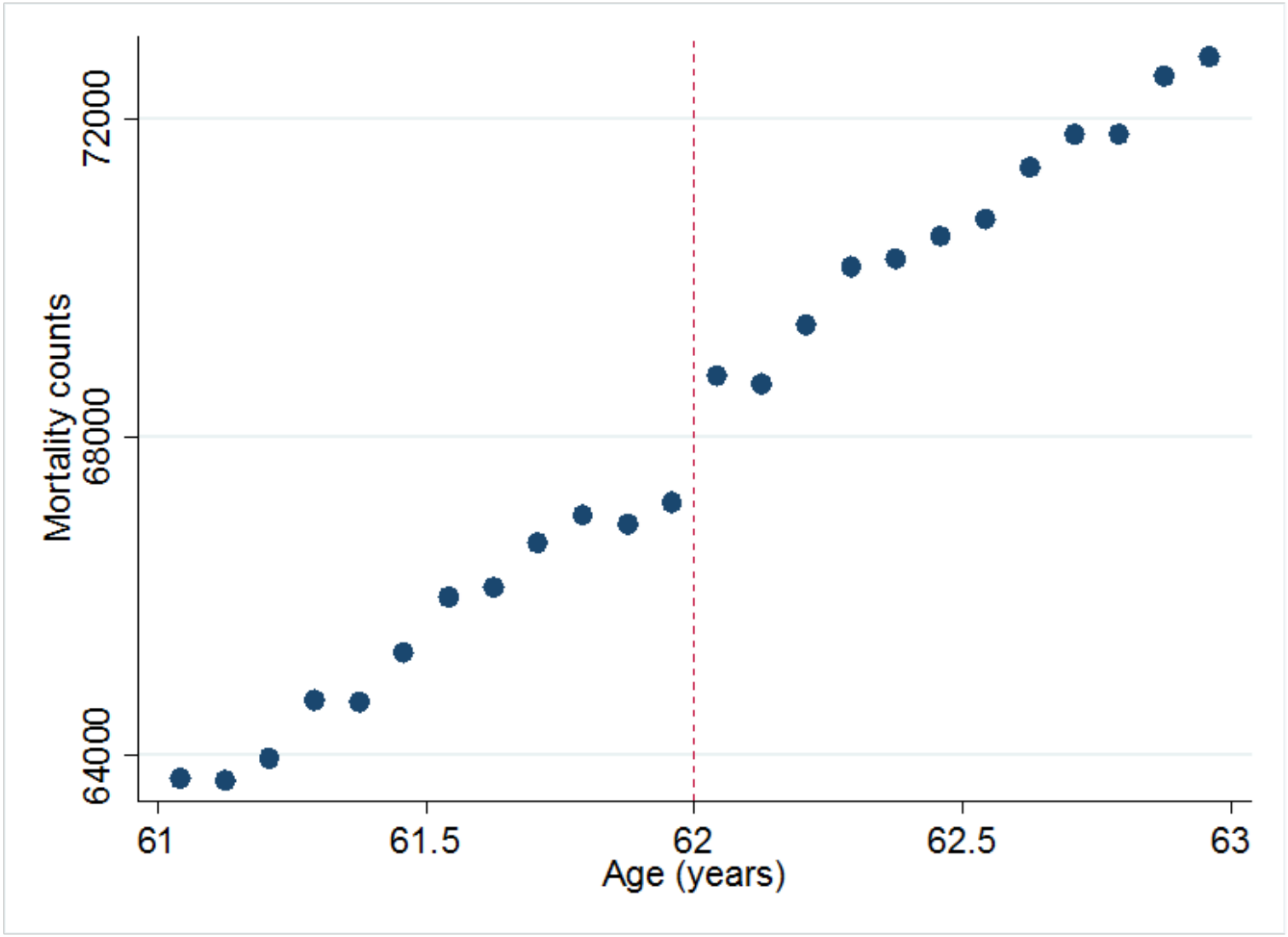
Mortality at Age 62

- Use Multiple Cause of Death (MCOD) data
  - Data covers whole population
  - Have exact dates of birth and death (restricted version)
- Examine mortality in relation to age 62
  - Regression discontinuity (RD) design using an age-based eligibility threshold
    - Follows, e.g., Card, Dobkin & Maestas (2009), Anderson, Dobkin & Gross (2014)
  - Estimating local average treatment effect of Social Security eligibility on mortality *if* no other changes at 62
  - Many concurrent changes: in retirement, work, level of activity, health insurance coverage

Preview of Results

- Mortality increases at age 62 by ~1.5 percent
- Increase for males is ~2 percent
  - Estimates are statistically significant across local nonparametric and global parametric RD specifications
  - Robust to modeling choices, including bandwidth
- Increase for females is ~1 percent
  - Estimates are not robust across modeling choices

Mortality in Relation to Age 62



Preview of Results

- Largest increases in male mortality occur for:
  - Males not married or with <high school educ.
  - Deaths outside of hospitals/institutions
  - Cause of death: external causes, lung cancer & COPD
- Male mortality increase present in different periods
  - Unaffected by Full Retirement Age rise from 65 to 66
- Suggestive evidence it may be other lifestyle changes rather than Social Security claiming per se

Existing Literature

- Variety of empirical strategies and many outcomes:
  - Cognitive functioning: e.g., Bonsang, Adam & Perelman (2012), Coe et al. (2012), Rohwedder & Willis (2010)
  - Self-reported health/subjective wellbeing: e.g., Charles (2004), Neuman (2008)
  - Mortality: Blake & Garrouste (2013), Coe & Lindeboom (2008), Hernaes et al. (2013), Kuhn, Wuellrich & Zweimuller (2010)
  - Other/multiple outcomes: e.g., Behncke (2012), Bound & Waidmann (2007), Coe & Zamarro (2011), Dave, Reshad & Spasojevic (2008), Insler (2014), Eibich (2015)
- Lack of consensus on direction of effects, especially for objective health outcomes
- Little information on heterogeneity, mechanisms

I. Data and Empirical Approach

Data

- MCOD data (National Center for Health Statistics)
  - Combine dates of birth and death to get exact age
  - Demographics: sex, age, race, marital status, education
  - Underlying cause and place of death
  - Create mortality counts for birth cohorts 1921-1948
- Complement with:
  - 1% extract of Master Beneficiary Record
  - Health and Retirement Study

Empirical Framework

- RD Specification

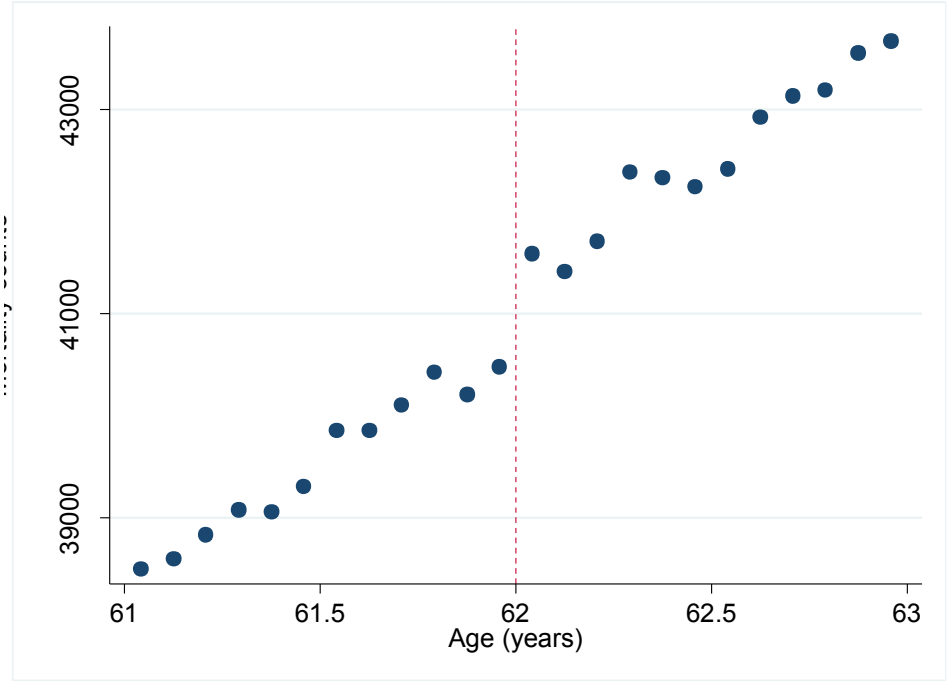
$$\log(Mortality_a) = f(a) + Post62_a\beta + \varepsilon_a$$

  - Dependent variable is log mortality at age of death (measured in months) in relation to age 62, *a*
  - Control for age-mortality relationship on either side of the discontinuity
  - $Post62_a$ is a dummy variable if $a \geq 62$
  - Use robust standard errors, ε_a
  - Coefficient of interest, β, represents change in mortality at age 62
  - Estimates are robust to both global parametric and local non-parametric methods

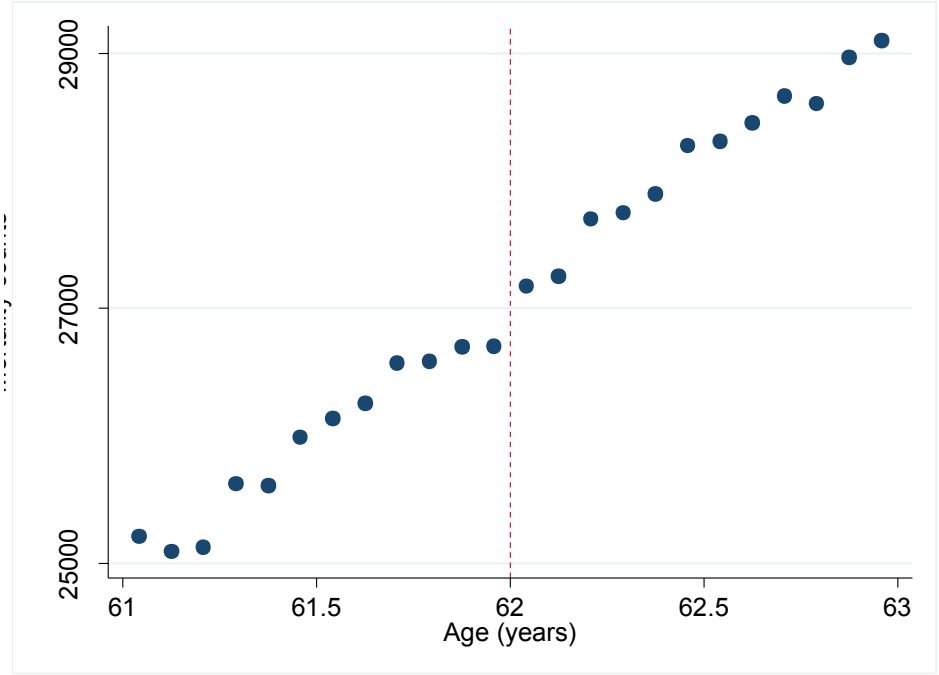
II. Main Results

Mortality in Relation to Age 62, by Sex

A: Males



B: Females



Regression Estimates

Regression type	All (1)	Males (2)	Females (3)
Global parametric regressions (bandwidth = 12 months)			
Quadratic regression	0.0135***	0.0185***	0.0058
	(0.0043)	(0.0049)	(0.0049)
Cubic regression	0.0197***	0.0236***	0.0138***
	(0.0049)	(0.0060)	(0.0047)
Quartic regression	0.0193***	0.0243***	0.0116***
	(0.0051)	(0.0082)	(0.0043)
Polynomial minimizing AICc	Cubic	Quadratic	Quartic
Local nonparametric regressions			
Local linear using data-driven bandwidth	0.0142***	0.0215***	0.0103***
	(0.0036)	(0.0041)	(0.0030)
Data-driven bandwidth	10 months	7 months	6 months
Local quadratic using data-driven bandwidth	0.0194***	0.0233***	0.0131***
	(0.0039)	(0.0058)	(0.0026)
Data-driven bandwidth	7 months	7 months	8 months

Note: **p<0.05, ***p<0.01

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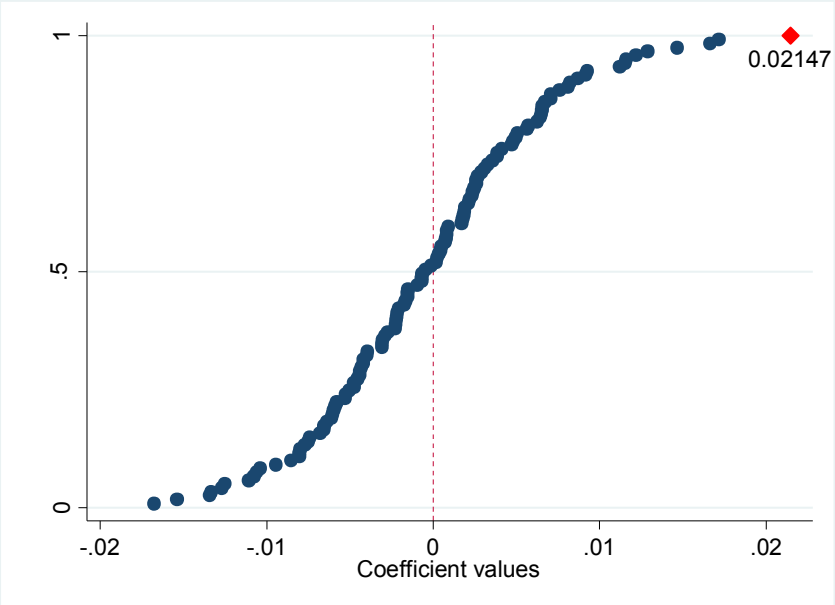
Additional Checks

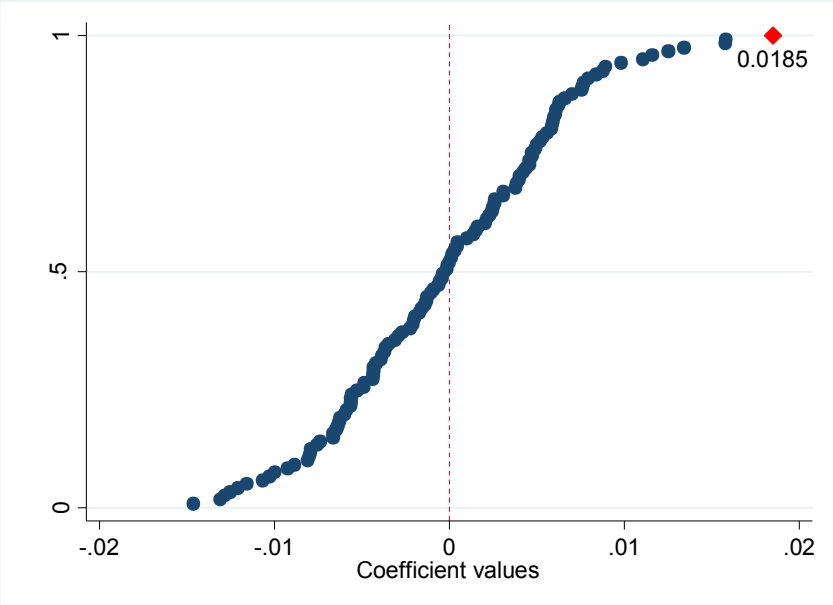
- Using daily or weekly counts
- In the parametric regressions:
  - Adding year-of-birth fixed effects
  - Adding month-of-death fixed effects
- Using Social Security eligibility dates
- Varying the bandwidth
  - Focus on local linear and global quadratic
- Donut-hole techniques
- Placebo techniques
  - No effect at ages 61 or 63
  - Estimate discontinuity at all ages between 57 and 67

Distribution of Placebo Male Mortality Estimates for +/- 60 Months of Age 62

A: Local linear specification using CCT-calculated bandwidths



B: Global quadratic specification using a bandwidth of 12 months



III. Heterogeneity and Potential Mechanisms

Demographics: Marital Status

	Local linear (1)	Global quadratic (2)	Fraction deaths (3)
Married	0.0130**	0.0081	65.1%
	(0.0058)	(0.0057)	
	6 months	12 months	
Not married	0.0415***	0.0377***	34.9%
	(0.0079)	(0.0107)	
	6 months	12 months	
- Single	0.0558***	0.0514***	9.9%
	(0.0056)	(0.0111)	
	6 months	12 months	
- Divorced	0.0305***	0.0337**	18.9%
	(0.0111)	(0.0137)	
	8 months	12 months	
- Widowed	0.0330	0.0262	6.2%
	(0.0202)	(0.0248)	
	11 months	12 months	

Demographics: Educ. Attainment

	Local linear (1)	Global quadratic (2)	Fraction deaths (3)
Did not complete high school	0.0303***	0.0275**	27.6%
	(0.0103)	(0.0115)	
	8 months	12 months	
Completed high school, not college	0.0087	0.0099	56.5%
	(0.0050)	(0.0066)	
	7 months	12 months	
Completed college	0.0146	0.0187	15.9%
	(0.0146)	(0.0181)	
	8 months	12 months	

Heterogeneity: Place of Death

	Local linear (4)	Global quadratic (5)	Fraction deaths (6)
Out of hospital/ institution	0.0339***	0.0323***	34.6%
	(0.0074)	(0.0073)	
	12 months	12 months	
In hospital	0.0124	0.0130	58.5%
	(0.0064)	(0.0070)	
	11 months	12 months	
In nursing home/ institution	-0.0022	-0.0079	6.2%
	(0.0161)	(0.0194)	
	8 months	12 months	

Heterogeneity: Cause of Death

	Local linear (4)	Global quadratic (5)	Fraction deaths (6)
Heart and lung conditions	0.0250**	0.0135	39.2%
	(0.0106)	(0.0119)	
- Heart attacks	0.0159	0.0072	19.4%
	(0.0138)	(0.0172)	
- COPD	0.0696***	0.0496**	4.2%
	(0.0089)	(0.0180)	
- Not heart attacks or COPD	0.0064	0.0118	15.6%
	(0.0106)	(0.0115)	
Cancers	0.0262***	0.0263***	33.6%
	(0.0072)	(0.0084)	
- Lung cancer	0.0531***	0.0510***	13.1%
	(0.0097)	(0.0108)	
- Not lung cancer	0.0099	0.0106	20.6%
	(0.0080)	(0.0092)	
External causes	0.0314***	0.0399**	5.0%
	(0.0103)	(0.0163)	
All other causes	0.0113	0.0109	22.1%
	(0.0109)	(0.0106)	

Potential Mechanisms

1. Income from Social Security ("Unhealthy" consumption)

- Payday effects
  - *Pattern of results isn't consistent with previous literature on payday effects (Evans and Moore)*
- Effect of more resources
  - *Results are similar across cohorts with different levels of benefits*
  - *Patterns of claiming are similar across gender, but mortality patterns are not*
  - *Patterns of claiming across socioeconomic characteristics of males not consistent with patterns in mortality*

Potential Mechanisms

2. Retirement from labor force/decrease in work

- *Does heterogeneity in retirement match heterogeneity in mortality effects?*

3. Change in health insurance status

- *Does heterogeneity in health insurance match heterogeneity in mortality effects?*

Fraction Partially or Fully Retired

	Last interview before 62 (1)	First interview after 62 (2)	Difference [(2)-(1)] (3)
SS at 62: males (%)	45.5	84.0	38.5
SS at 62: females (%)	39.1	69.2	30.1
SS at 62: males, married (%)	45.6	83.2	37.6
SS at 62: males, non-married (%)	45.2	87.2	42.0
SS at 62: males, <high school (%)	30.3	79.4	49.1
SS at 62: males, high school grad. (%)	46.9	84.7	37.8
SS at 62: males, college graduate (%)	53.7	85.9	32.2
Other respondents: males (%)	33.6	40.5	6.9
Other respondents: females (%)	32.7	42.7	10.0

Fraction Working for Pay

	Last interview before 62 (1)	First interview after 62 (2)	Difference [(2)-(1)] (3)
SS at 62: males (%)	65.6	34.9	-30.7
SS at 62: females (%)	49.2	28.3	-20.9
SS at 62: males, married (%)	66.8	36.7	-30.1
SS at 62: males, non-married (%)	61.0	28.3	-32.7
SS at 62: males, <high school (%)	71.8	34.6	-37.2
SS at 62: males, high school grad. (%)	65.5	35.3	-30.2
SS at 62: males, college graduate (%)	60.8	34.2	-26.6
Other respondents: males (%)	67.8	63.0	-4.8
Other respondents: females (%)	55.5	50.0	-5.5

Fraction without Health Insurance

	Last interview before 62 (1)	First interview after 62 (2)	Difference [(2)-(1)] (3)
SS at 62: males (%)	17.4	21.6	4.2
SS at 62: females (%)	22.2	27.1	4.9
SS at 62: males, married (%)	14.0	19.7	5.7
SS at 62: males, non-married (%)	30.3	28.7	-1.6
SS at 62: males, <high school (%)	29.1	35.8	6.7
SS at 62: males, high school grad. (%)	14.0	17.5	3.5
SS at 62: males, college graduate (%)	17.0	21.4	4.4
Other respondents: males (%)	13.2	11.7	-1.5
Other respondents: females (%)	17.1	17.7	0.6

Conclusion

- Clear increase in male mortality at age 62
  - If attributed to Social Security eligibility, indicates negative health effects among age 62 claimants
- Suggestive evidence that may not be receipt of Social Security itself, but concurrent changes
- RD design makes it difficult to assess how local these mortality effects are

Thanks.