Income and Health

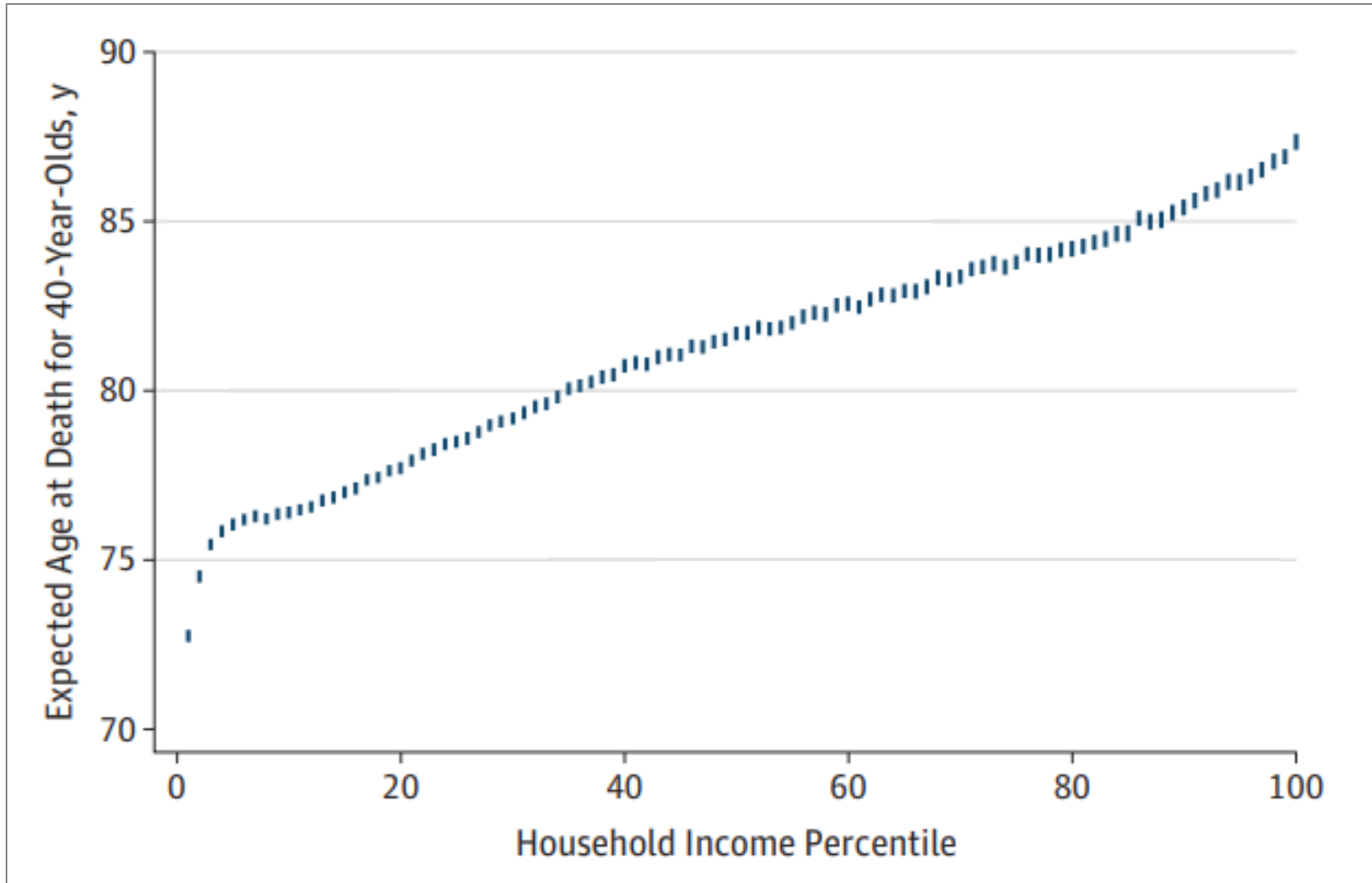## Economics of Health Equity Seminar
February 2024

Sumit Agarwal

Harvard PhD Program in Health Policy
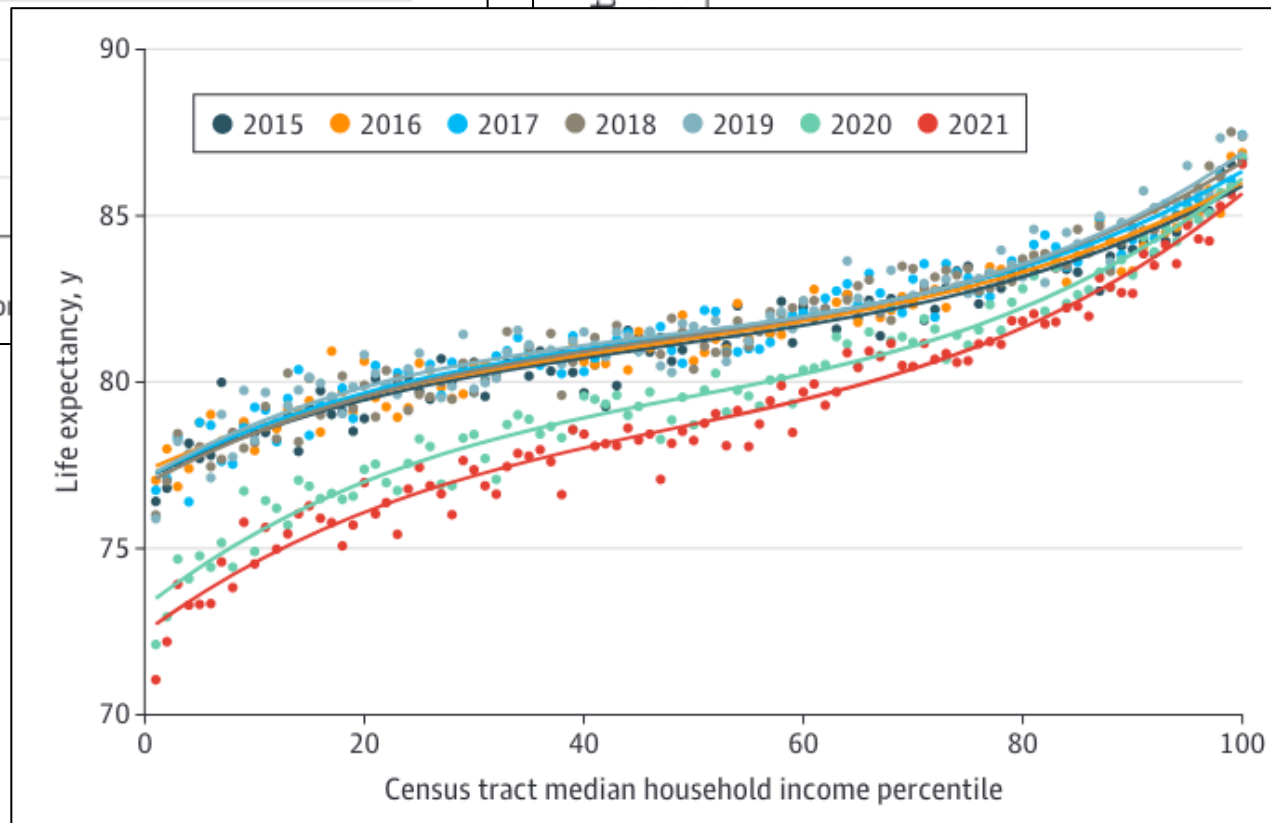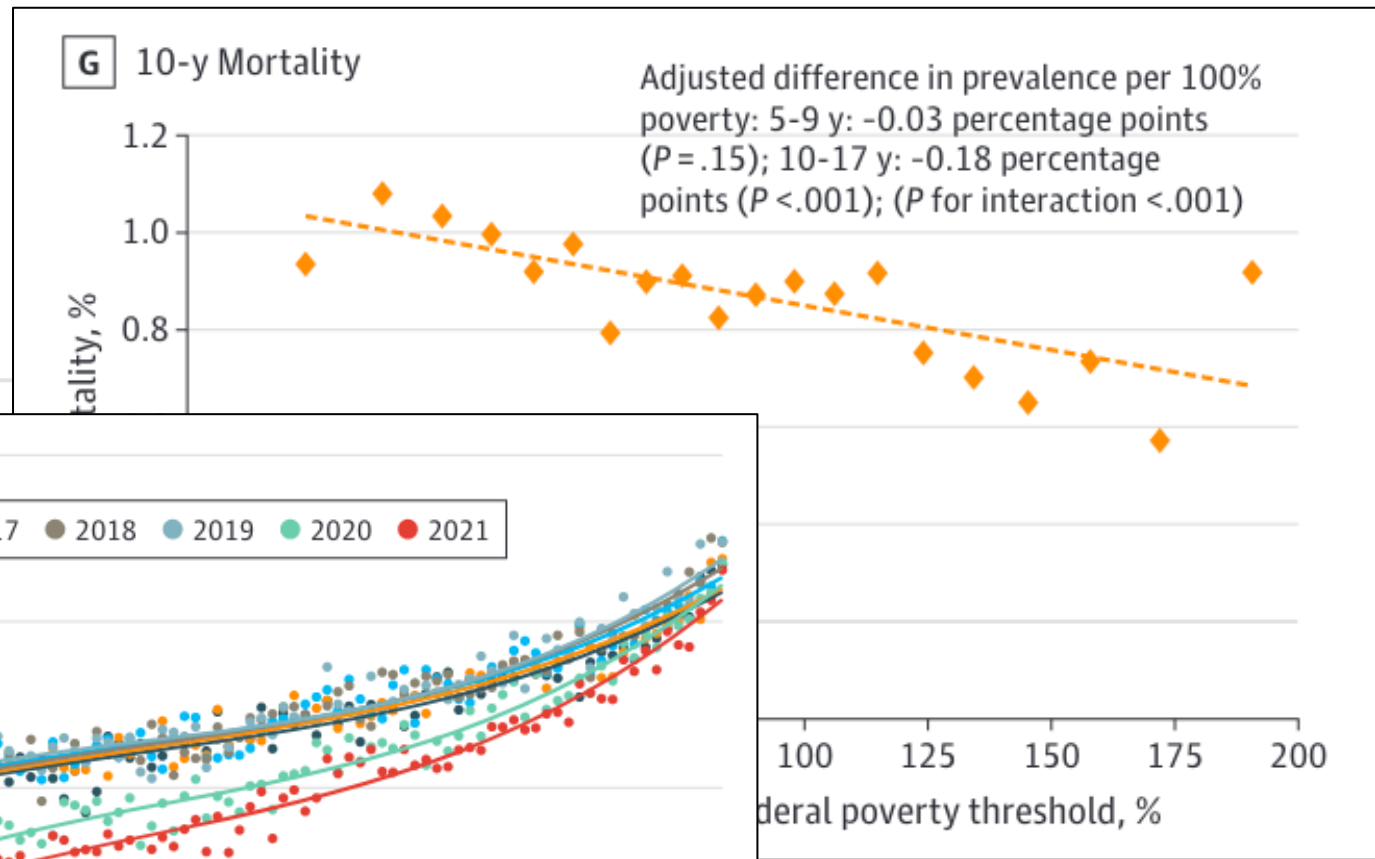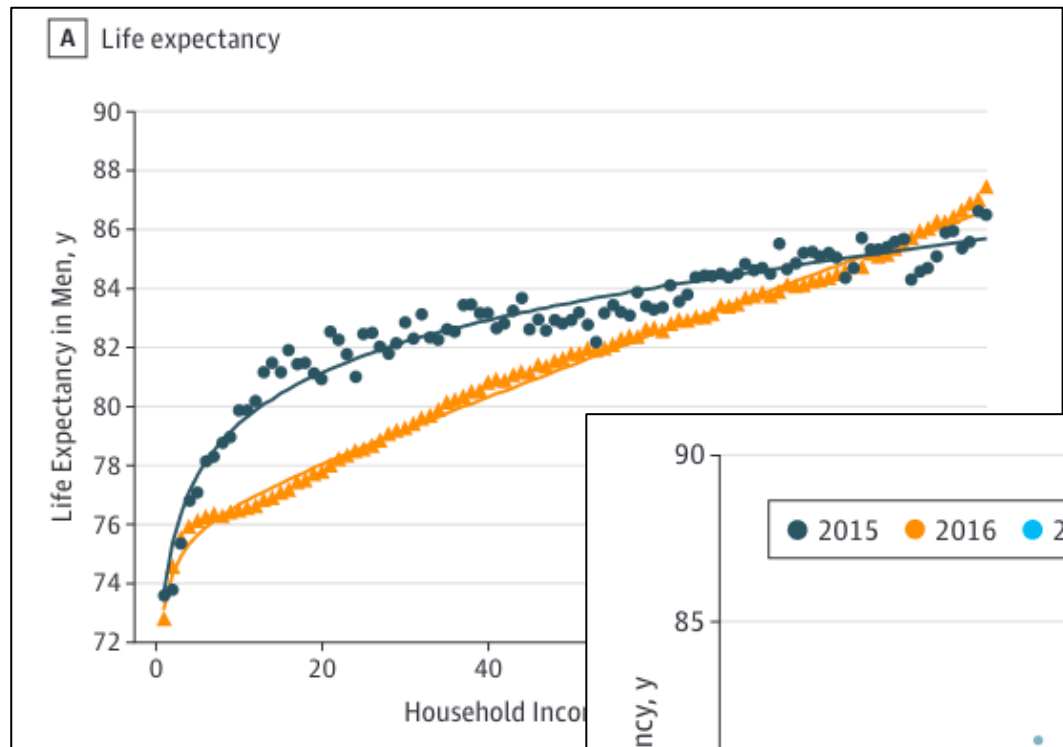
Outline

1. The Income-Health Relationship

2. Two Studies
   - Social Security Income
   - Guaranteed Income

3. Reconciling the Results

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1. **The Income-Health Relationship**
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Figure: Chart showing Expected Age at Death for 40-Year-Olds (y) on the y-axis (ranging from 70 to 90) versus Household Income Percentile on the x-axis (ranging from 0 to 100). The data shows an increasing trend from approximately 73 years at the lowest income percentile to approximately 87 years at the highest income percentile.

Chetty et al. (2016), Kinge et al. (2019), Schwandt et al. (2022), Udalova et al. (2022)

A Life expectancy

G 10-y Mortality

Adjusted difference in prevalence per 100% poverty: 5-9 y: −0.03 percentage points (*P* = .15); 10-17 y: −0.18 percentage points (*P* < .001); (*P* for interaction < .001)

Chetty et al. (2016), Kinge et al. (2019), Schwandt et al. (2022), Udalova et al. (2022)

Related literature

- **Randomized controlled trials**
  - Negative income tax (Elesh and Lefcowitz 1977; Kehrer and Wolin 1979; Federal Reserve Bank of Boston and The Brookings Institution 1986)
  - Expansion of EITC (Courtin et al. 2020, 2021)
  - Basic income (Kangas et al. 2019; West and Castro 2023; Troller-Renfree et al. 2022; Gennetian et al., 2022; OpenResearch 2020; **Agarwal et al. 2024**)
  - One-time payments (Pilkauskas et al. 2023; Jacob et al. 2022; Jarozewicz et al. 2022)

- **Quasi-experimental studies**
  - Winning the lottery (e.g., Lindahl 2005; Cesarini et al. 2016*)
  - Basic income (Forget 2011*)
  - Social Security notch or SSDI/SSI discontinuities (Snyder & Evans 2006; Golberstein 2015; Berman 2020*; Gelber et al. 2022; **Hawkins et al. 2023**)
  - Examiner assignment for disability (Silver & Zhang 2022*)
  - Dividend payments from casinos or Alaska's oil fund (e.g., Akee et al. 2010; Costello et al. 2003; Guettabi and Witman 2022*)
  - Expansions of EITC (e.g., Evans & Garthwaite 2014; Collin et al. 2021)
  - Intra-month variation in day checks arrive (e.g., Phillips et al. 1999; Dobkin and Puller 2007; Evans & Moore 2011, 2012; Barr et al. 2022)
  - Pandemic-era programs: unemployment assistance, child tax credit (Berkowitz & Basu 2021; Shafer et al. 2022; Bovell-Ammon et al. 2022; Bouchelle et al. 2022; Evangelist et al. 2021; Batra et al. 2023; Bullinger & Boy 2023; Glasner et al. 2022; Parolin et al. 2021; Pilkauskas et al. 2022)
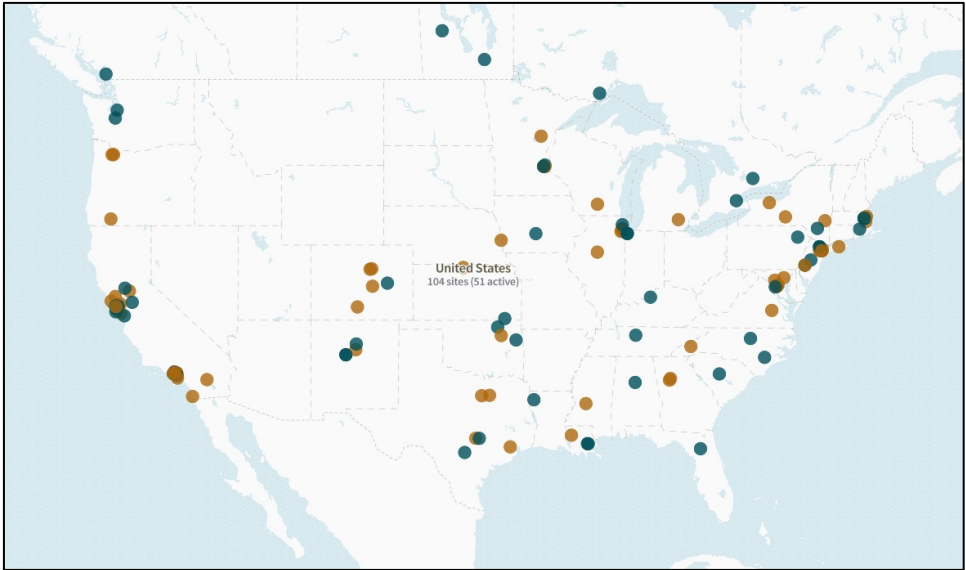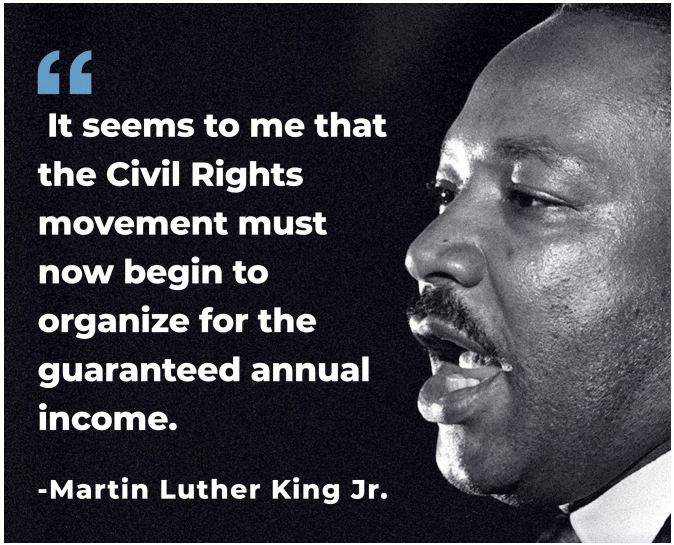
Grossman model of health capital

$$U = \boxed{\beta} * \sum_{t=0}^{T} (1 + \rho)^{-t} \, v(c_t, H_t)$$

$$H_{t+1} = \boxed{\theta} m_t + (1 - \delta_t) H_t + \boxed{Y_t}$$

$$\Theta = 24 = \boxed{T^W + T^P + T^H + T^S}$$

$$\sum_{t=0}^{T} \frac{c_t}{(1 + r)^t} + \sum_{t=0}^{T} \frac{p_m m_t}{(1 + r)^t} = A_o + \sum_{t=0}^{T} \frac{\boxed{y_t(H_t)}}{(1 + r)^t}$$

1. Consumption
2. Time use
3. Stress levels

"It seems to me that the Civil Rights movement must now begin to organize for the guaranteed annual income.

-Martin Luther King Jr.

ANDREW YANG FOR PRESIDENT

UNIVERSAL BASIC INCOME
YANG2020.com

United States
104 sites (51 active)

House passes bipartisan tax bill that would expand child tax credit

The tax package would increase child tax credit and restore other deductions.

By Lauren Peller
January 31, 2024, 8:45 PM

Outline

NBER WORKING PAPER SERIES

THE LONG-TERM EFFECTS OF INCOME FOR AT-RISK INFANTS:
EVIDENCE FROM SUPPLEMENTAL SECURITY INCOME

Amelia A. Hawkins
Christopher A. Hollrah
Sarah Miller
Laura R. Wherry
Gloria Aldana
Mitchell D. Wong

Working Paper 31746
http://www.nber.org/papers/w31746

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
September 2023

# Hawkins, Hollrah, Miller, Wherry, Aldana, and Wong (2023)

- Leverage a policy discontinuity at birthweight of 1,200 grams (2.6 lbs) for babies born at 32 weeks
  - Running variable is birthweight (in grams) from birth certificate records
  - Automatic eligibility for SSI (and Medicaid)
- Outcomes from administrative data
  - Receipt of SSI benefits (infancy, ages 1-2, ages 3-10, ages 11-17)
    - And total household resources = labor market income + EITC + SSI (infancy to age 17)
  - Medicaid enrollment (infancy to age 17)
  - Hospitalization and emergency department utilization (at birth, infancy)
  - Infant mortality
  - High school performance (summary index, GPA, AP courses, math/science courses, repeat grade, special education)
  - Post-secondary school attendance and college degree attainment
  - Earnings and use of SSI/Medicaid/EITC as young adult (age 19 to 29 & age 22 to 29)
  - Mortality as young adult
- But wait, there's more!
  - Subgroups
  - Siblings
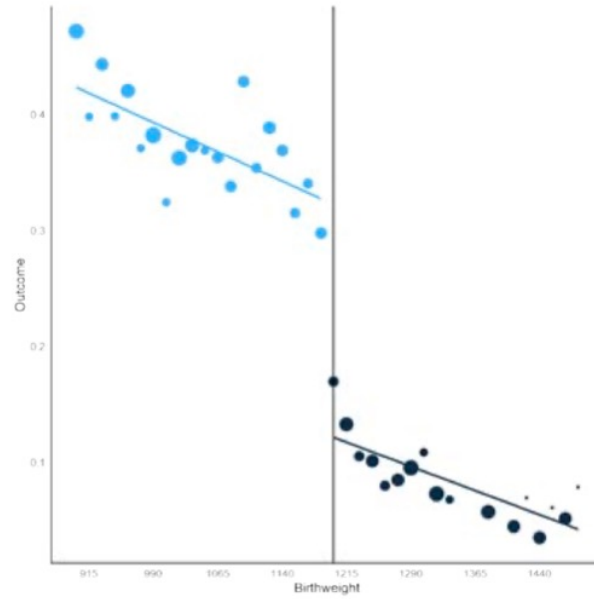
Hawkins, Hollrah, Miller, Wherry, Aldana, and Wong (2023)

Data Source	Measures/Outcomes
California Birth Certificates	Running variable (birthweight); Matching variables (name, DOB, address of infant & infant); Mother's education as alternative to baseline income
Census data e.g., Census Household Composition Key (CHCK) & others	Helps with matching of infants to parents
IRS 1040s and W-2s and Longitudinal Employer-Household Dynamics (LEHD)	Mother's earnings as proxy for baseline household income; Earnings of the infant turned young adult
Social Security Administration (SSA)	Monthly SSI benefit receipt and amount
Center for Medicare and Medicaid Services	Medicaid enrollment
California Department of Health Care Access and Information (HCAI) & Census Numident	Health care utilization and mortality
Educational Results Partnership (ERP)	Educational outcomes
National Student Clearinghouse (NSC)	Post-secondary school enrollment and degree attainment

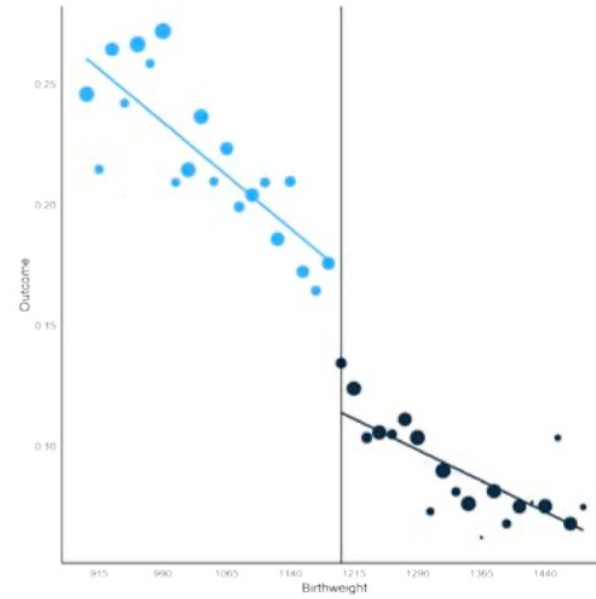# Hawkins, Hollrah, Miller, Wherry, Aldana, and Wong (2023)

- **Children born in California from 1993-2019**
  - Focus on low-income households by matching infant to mother's information

- **Linked to administrative data**
  - Census' uses their Person Identification Validation System (PVS) to assign each infant a Protected Identification Key (PIK) using name, DOB, and address on birth certificates
  - PIK rate of 94% and don't differ across the threshold

- **Regression discontinuity**
  - Likely no manipulation but there is rounding ("heaping")
  - "Fuzzy" RD, focus on reduced form (ITT) estimates
  - Local linear
  - Triangle kernel
  - Bandwidth (900 to 1499 g), 300 grams on either side, 15-gram bins
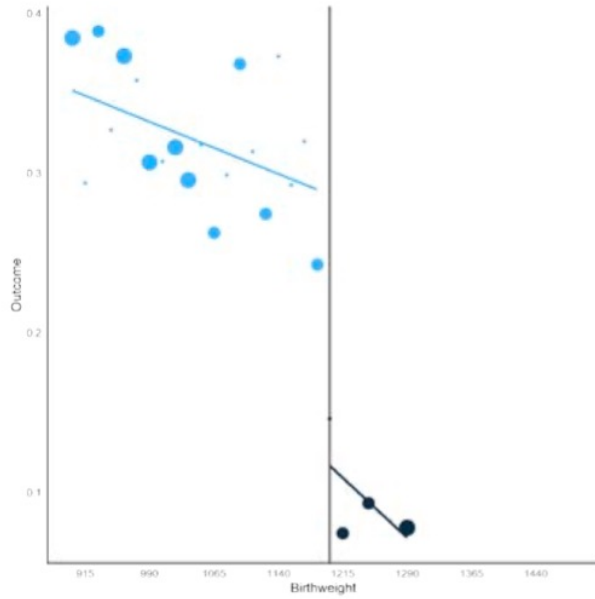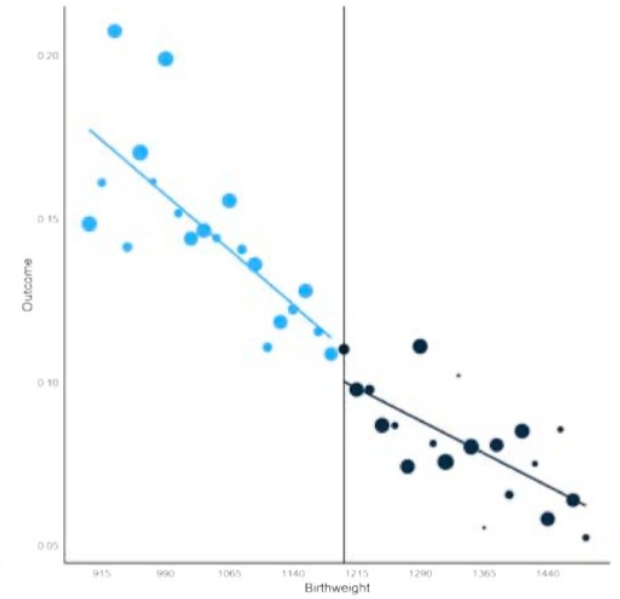
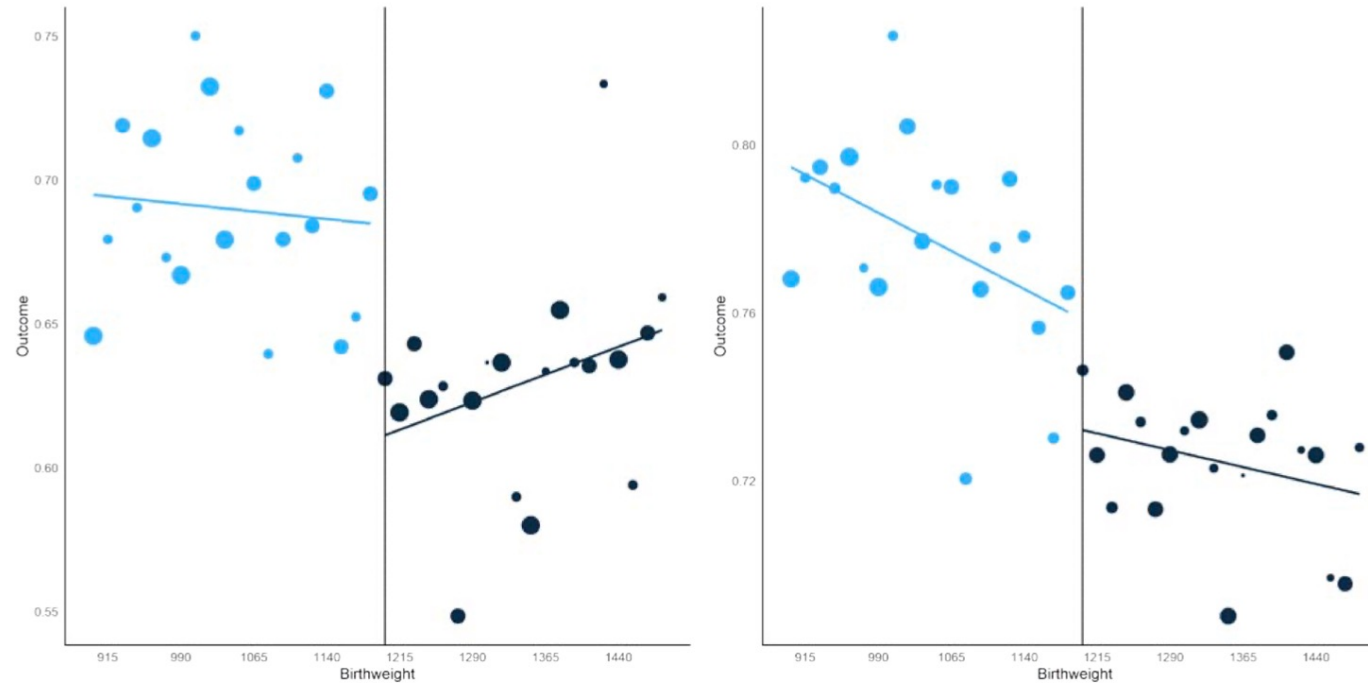(a) Any SSI Benefits, Infancy   (b) Any SSI Benefits, Ages 1-2   (c) Any SSI Benefits, Ages 3-10   (d) Any SSI Benefits, Ages 11-17
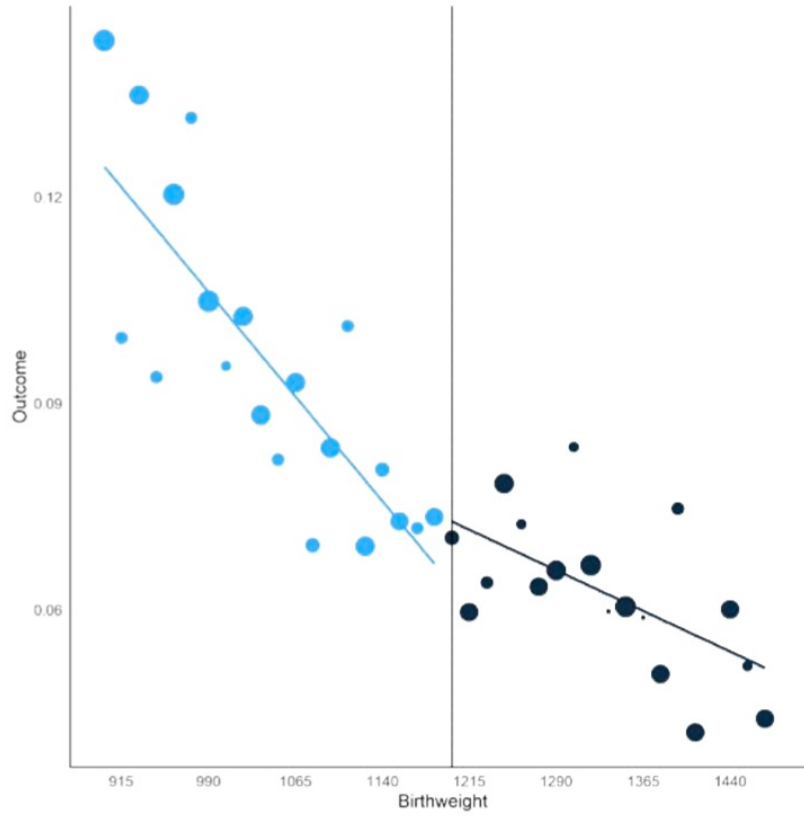
Figure 2: Medicaid Enrollment by Age and Birthweight Bin
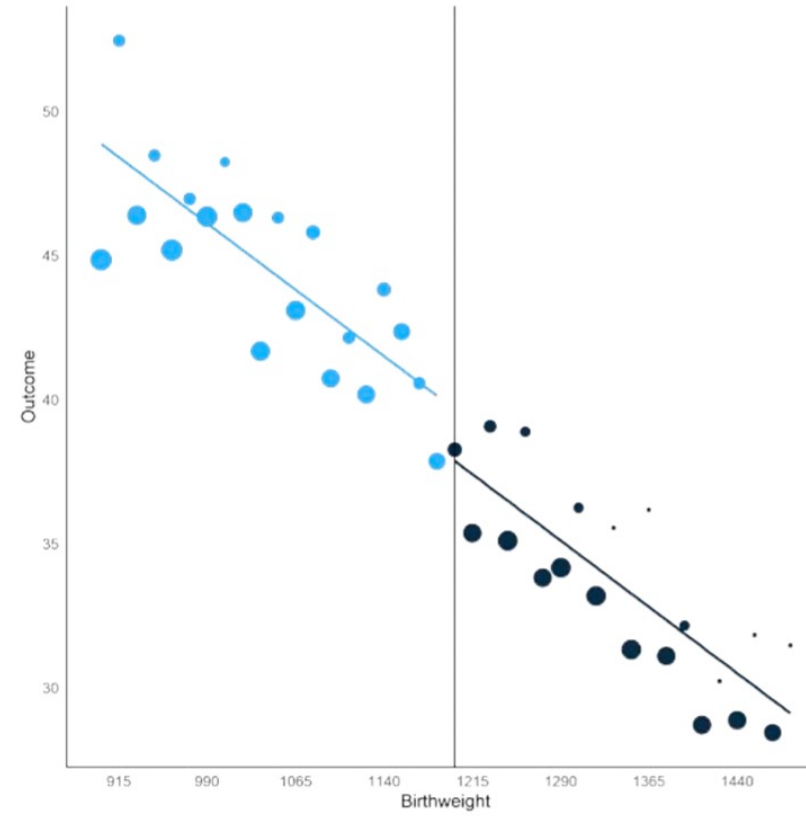
(a) Any Medicaid Enrollment, Infancy   (b) Any Medicaid Enrollment, Ages 1-2

	Any Medicaid enrollment, by age			
	0	1-2	3-10	11-17
RD Estimate	-0.0509***	-0.0250*	-0.0349***	-0.0481***
	(0.0164)	(0.0137)	(0.0129)	(0.0181)
N Individual x Year	17500	32000	125000	69500
N Individual	17500	17000	20500	12500
Baseline	0.4930	0.7310	0.6550	0.5670

(a) Mortality

	Mortality
RD Estimate	0.0048
	(0.0078)
N	21000
Baseline	0.0680

(b) Days in the Hospital at Birth

	Birth Days
RD Estimate	-1.982**
	(0.9752)
N	21500
Baseline	44.9
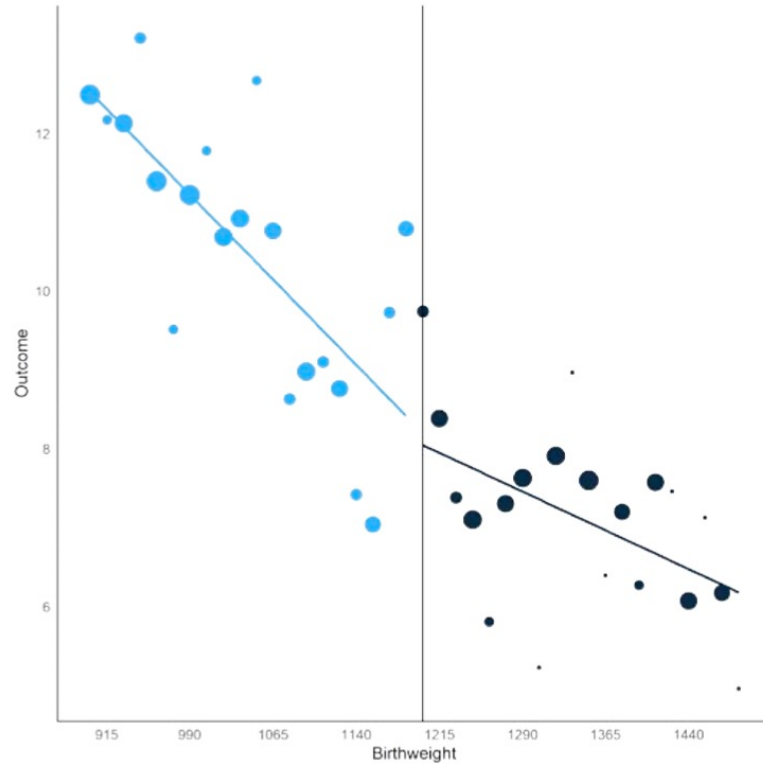
(c) Days in the Hospital After Birth
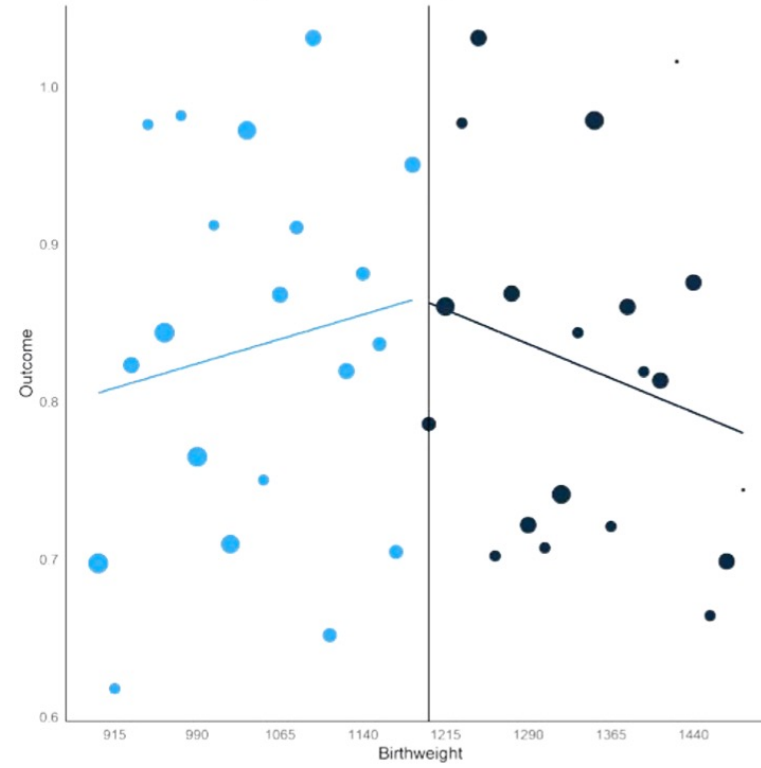
(d) Number of ED Visits

	IP Days	ED Visits
RD Estimate	-0.3395	0.0032
	(0.6791)	(0.0705)
N	22000	8700
Baseline	8.174	0.8880

Large first-stage but no medium- or long-term effects...

- How would the cash benefit (+bit more Medicaid) have helped?
    - Food insecurity, formula, diapers, syringes
    - Overcome transportation or other barriers to medical care
    - Parental time use, stress
    - Companion paper (2018) shows improvements in child development and parenting behaviors

- Opposing effects?
    - No guarantee that the money will be spent on child
    - Disincentives for work (Hawkins et al. 2023)
    - Negative human capital investment (Deshpande and Dizon-Ross 2023)
    - Stigma

- Early childhood but maybe payments weren't large enough to overcome severe medical & economic disadvantage
    - Example of poor health → low income
    - What if we intervened earlier (fetal origins hypothesis: Almond and Currie 2011)

- Could still have important effects on more proximal outcomes (food insecurity, stress, hardship) that are unmeasured but welfare-relevant (streetlight effect)

Other thoughts

- Linking to administrative data
  - How do linkage rates differ across data sources?
  - Sample sizes vary? 14.6 million children → 7,300-29,000?
  - Are non-linked excluded or assumed to be zero?
  - Why does someone not match, and who are among the excluded?

- Regression discontinuity
  - Robust to smaller bandwidth? 600 g = 2/3rd pound
  - Robust to polynomial functions of X (relax linearity assumption)?

- Testing of multiple hypotheses

Outline

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2. Two Studies
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   - **Guaranteed Income**

3. Reconciling the Results

Chelsea, Massachusetts

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3. **Reconciling the Results**

Reconciling the Results

	SSI	Chelsea
Method	Regression discontinuity	Randomized controlled study
Outcomes	Administrative data; Short, medium, and long-term outcomes: Health care utilization, mortality, education, labor market	Administrative data; Short-term outcomes: Health care utilization, biomarkers
Setting	California, 1993-2019	Chelsea, 2020-2021 (pandemic)
Amount	$800 per month x 2 years Administered by Social Security	$400 per month x 9 months Administered by City of Chelsea Branded "Chelesa Eats"
Population / Eligibility	Infants, followed to young adulthood Low-income families Early childhood as a critical period LATE: Infants ~1200 grams, <32 weeks	Adults (80% female) Low-income families Many undocumented

Income and Health

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