Income and Health

Economics of Health Equity Seminar
February 2024

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

- **Randomized controlled trials**
  - 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; Jarzewicz 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

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

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

\[ \Theta = 24 = T^W + T^P + T^H + T^S \]

\[ \sum_{t=0}^{T} \frac{c_t}{(1 + r)^t} + \sum_{t=0}^{T} \frac{p_m m_t}{(1 + r)^t} = A_o + \sum_{t=0}^{T} y_t(H_t) \]
"It seems to me that the Civil Rights movement must now begin to organize for the guaranteed annual income."

-Martin Luther King Jr.

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 Poller
January 31, 2024, 8:45 PM
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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
<table>
<thead>
<tr>
<th>Data Source</th>
<th>Measures/Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>California Birth Certificates</td>
<td>Running variable (birthweight); Matching variables (name, DOB, address of infant &amp; infant); Mother’s education as alternative to baseline income</td>
</tr>
<tr>
<td>Census data e.g., Census Household Composition Key (CHCK) &amp; others</td>
<td>Helps with matching of infants to parents</td>
</tr>
<tr>
<td>IRS 1040s and W-2s and Longitudinal Employer-Household Dynamics (LEHD)</td>
<td>Mother’s earnings as proxy for baseline household income; Earnings of the infant turned young adult</td>
</tr>
<tr>
<td>Social Security Administration (SSA)</td>
<td>Monthly SSI benefit receipt and amount</td>
</tr>
<tr>
<td>Center for Medicare and Medicaid Services</td>
<td>Medicaid enrollment</td>
</tr>
<tr>
<td>California Department of Health Care Access and Information (HCAI) &amp; Census Numident</td>
<td>Health care utilization and mortality</td>
</tr>
<tr>
<td>Educational Results Partnership (ERP)</td>
<td>Educational outcomes</td>
</tr>
<tr>
<td>National Student Clearinghouse (NSC)</td>
<td>Post-secondary school enrollment and degree attainment</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th></th>
<th>Any Medicaid enrollment, by age</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
</tr>
<tr>
<td>RD Estimate</td>
<td>-0.0509***</td>
</tr>
<tr>
<td></td>
<td>(0.0164)</td>
</tr>
<tr>
<td>N Individual x Year</td>
<td>17500</td>
</tr>
<tr>
<td>N Individual</td>
<td>17500</td>
</tr>
<tr>
<td>Baseline</td>
<td>0.4930</td>
</tr>
</tbody>
</table>
(a) Mortality

<table>
<thead>
<tr>
<th></th>
<th>Mortality</th>
<th></th>
<th>Birth Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>RD Estimate</td>
<td>0.0048</td>
<td>(0.0078)</td>
<td>-1.982**</td>
</tr>
<tr>
<td>N</td>
<td>21000</td>
<td></td>
<td>21500</td>
</tr>
<tr>
<td>Baseline</td>
<td>0.0680</td>
<td></td>
<td>44.9</td>
</tr>
</tbody>
</table>
(c) Days in the Hospital After Birth

(d) Number of ED Visits

<table>
<thead>
<tr>
<th>RD Estimate</th>
<th>IP Days</th>
<th>ED Visits</th>
</tr>
</thead>
<tbody>
<tr>
<td>(0.6791)</td>
<td>(0.0705)</td>
<td>0.0032</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>N</th>
<th>22000</th>
<th>8700</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>8.174</td>
<td>0.8880</td>
</tr>
</tbody>
</table>
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
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<tr>
<th></th>
<th>SSI</th>
<th>Chelsea</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Method</strong></td>
<td>Regression discontinuity</td>
<td>Randomized controlled study</td>
</tr>
<tr>
<td><strong>Outcomes</strong></td>
<td>Administrative data; Short, medium, and long-term outcomes: Health care utilization, mortality, education, labor market</td>
<td>Administrative data; Short-term outcomes: Health care utilization, biomarkers</td>
</tr>
<tr>
<td><strong>Setting</strong></td>
<td>California, 1993-2019</td>
<td>Chelsea, 2020-2021 (pandemic)</td>
</tr>
<tr>
<td><strong>Amount</strong></td>
<td>$800 per month x 2 years Administered by Social Security</td>
<td>$400 per month x 9 months Administered by City of Chelsea Branded “Chelesa Eats”</td>
</tr>
<tr>
<td><strong>Population / Eligibility</strong></td>
<td>Infants, followed to young adulthood Low-income families Early childhood as a critical period LATE: Infants ~1200 grams, &lt;32 weeks</td>
<td>Adults (80% female) Low-income families Many undocumented</td>
</tr>
</tbody>
</table>