The Intergenerational Transmission of Poverty and the Long Reach of Child Health and Nutrition Programs

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With the onset of a new administration, we again debating the role of government, and the relevance of safety net programs, particularly Medicaid, in the lives of low income families.

Economists have long focused on estimating the costs of these programs, particularly their impact on individuals’ incentives to work.

Until recently, the tools used by economists were only rarely applied to study the benefits of health and nutrition programs aimed at poor families.

My research seeks to understand the many forces that contribute to the intergenerational transmission of poverty. One part of this includes quantifying the benefits to children from government interventions.
Why Children?

• Child poverty is higher than for other age groups.
  o Child poverty rate 19.7%
  o Adult poverty rate 12.4%
  o Elderly poverty rate 8.8%

• One in ten children spends half of their childhood in poverty (Wagmiller and Adelman, 2009)
Figure 1.1a Relative child poverty rates

% of children aged 0–17 living in households with equivalent incomes below 60% of national median

Finland
Netherlands
Denmark
Iceland
Norway
Slovenia
Sweden
Austria
Ireland
Switzerland
Germany
France
Czech Republic
United Kingdom
Hungary
Belgium
Luxembourg
Estonia
Slovakia
Poland
Canada
Portugal
Greece
Italy
Lithuania
Spain
Latvia
United States
Romania
Cyprus
Malta
Australia
New Zealand
Japan
Bulgaria

Why Children?

- Childhood poverty is a very strong predictor of later life poverty
  - Adults who spent at least one year of childhood in poverty are 10 times as likely to be poor at age 35 as those who were never poor during childhood (Wagmiller and Adelman, 2009)

- Children do not choose their economic circumstances
This talk: child health and nutrition interventions

• Poor children are less healthy than other children
• Health inequalities appear early in life and grow throughout childhood
• Poor children enter adulthood with more chronic health conditions
  o Asthma and other respiratory problems
  o Digestive disorders
  o Heart Conditions
  o Hearing problems
  o Mental health problems

• Poor children enter adulthood having missed more days of school
This talk: child health and nutrition interventions

• Negative health experiences in early life reduce educational and economic success in adulthood

• Research in biological and psychological sciences makes clear that health and psychological wellbeing –important inputs into economic success-- are malleable in early life
Expenditures on Children by Program 2015

- **Federal**
  - **Medicaid** 45 million children, $91.7 billion
  - **SNAP** 20 million children
  - **WIC** 2 million women + 6.3 million children, $6.3 billion

- **California**
  - **Medi-Cal** 6.8 million children
  - **CalFresh** 2 million children
  - **WIC** more than 1 million pregnant women and children

Per Capita Federal Expenditure on Means-Tested Programs, 2015 Dollars

Prior evidence on benefits

- Credible evidence on the benefits of Medicaid, SNAP and WIC has, until recently, been very sparse

- Most studies compare recipients to non-recipients
  - “Medicaid patients are 1.3 times as likely to be hospitalized for their asthma compared to non-Medicaid members”
  - “Participants in SNAP and related programs tend to be more food insecure compared to others that are eligible but do not participate”
  - “People on Medicaid have markedly worse outcomes than people on private insurance”
Improved research designs

• Experimental studies are the “gold standard”
  o Random assignment into “treatment” children (who have access to the program) and identical “control” children (who do not have program access)
  o Compare outcomes between treatment and control groups

• “Quasi-experimental” studies to emulate experimental conditions using variation in program access that is believed to be beyond the family’s control
  o Medicaid expansions of the 1980s
  o County roll out of the Food Stamp and WIC programs during the 1960s and 1970s
Medicaid Expansions

• Medicaid began in 1965

• Jointly run by federal and state governments, states have autonomy in design of some aspects of program

• Prior to the 1980s Medicaid coverage limited to families who received cash welfare under the AFDC program
  - AFDC eligibility varied by state, so poor families had different abilities to access Medicaid depending on the state in which they lived
  - AFDC primarily restricted to single parent families with children
Medicaid Expansions

- Beginning in the 1980s, a series of legislative changes broadened coverage to include low income pregnant women and children not tied to the welfare system.

- By 1990 all pregnant women and children under the age of six with family incomes below 133% of the poverty line and all children under age 19 with family incomes below 100% of the poverty line were eligible for Medicaid.

- Importantly, Medicaid eligibility and generosity was expanded differentially across states and over time.
Difference in prenatal coverage across cohorts born 1979-1986
Difference in eligibility at ages 1-4 between 1979-1986 cohorts
Medicaid: what have we learned?

• Gains in health insurance coverage (Buchmueller, Ham and Shore-Sheppard, 2015)

• Gains in health care utilization (Currie and Gruber, 1996; Dubay et. al., 2001; Dave et. al., 2008; Currie and Gruber, 2001)
Childhood exposure to Medicaid improves current and later life health outcomes

- Prenatal exposure
  - Reduces mortality among infants, children and black teens (Goodman-Bacon, 2015; Wherry and Meyer, 2016)
  - Reduces obesity and related conditions in later life (Miller and Wherry, 2015)
  - Reduces later life hospitalizations (Miller and Wherry, 2015)

- Childhood exposure reduces the likelihood of having a chronic health condition in adulthood (Boudreaux et al., 2016)
Childhood exposure to Medicaid improves economic outcomes

- A 10 percentage point increase in Medicaid eligibility during childhood decreases the high school dropout rate by 0.4 percentage points \((\text{Cohodes et. al., 2016})\)

- Childhood Medicaid exposure increases test scores \((\text{Levine and Schanzenbach, 2009})\)
Childhood exposure to Medicaid improves economic outcomes

• Each additional year of Medicaid eligibility from birth to age 18 is associated with
  o Increases in the probability of having attended college of 7 percent (women) and 3.6 percent (men)
  o Additional cumulative wages by age 28 of $656 (for women)
    o This gain is expected to grow as individuals age
  o Cumulative tax payments by age 28 of $127 (men) or $247 (women)

(Brown et. al., 2016)
Food Stamp start date, by county
(Hoynes and Schanzenbach, 2009)
SNAP improves health and self-sufficiency

- Availability of food stamps lowers the incidence of low birth weight by 7 percent (whites) 3 percent (blacks) (Almond, Hoynes and Schanzenbach, 2011)

- Children fully exposed to Food Stamps between conception and age 5 have better adult outcomes (Hoynes, Schanzenbach, Almond, 2016)
  - A 0.3 standard deviation reduction in the incidence of later life metabolic syndrome
  - A 0.2 standard deviation increase in the likelihood of being self sufficient in adulthood
    - Largely due to increases in educational attainment
    - Effects concentrated among girls
1996 Welfare Reform

- Compare health outcomes among U.S. children of immigrants whose access to Food Stamps changed in the years following PRWORA (East, 2016)

Figure 2: US-born Children’s Eligibility for Food Stamps
Elimination of Food Stamp eligibility reduces child health

- The likelihood that a child is reported to be in poor, fair or good health (relative to very good or excellent health) increased by 6 percent
WIC improves child health

• Prenatal exposure to WIC reduces the probability of being born below the low birthweight threshold by 1.4% (Hoynes et. al., 2011)
  o Similar findings (even larger) for comparable program in Canada (Haeck and Lefebvre, 2016)

• Prenatal exposure increases birth weight by an average of 27 grams (Rossin-Slater, 2013)
  o Concentrated in the middle of the birth weight distribution
Mechanisms

• “Fetal origins” hypothesis from developmental biology argues that there are “critical periods” in fetal and early childhood that are susceptible to the health environment and may affect chronic health conditions in adulthood (e.g. Barker, 1990)

• Life skill formation: investments in early childhood increase returns to human capital in later life (e.g. Heckman, 2006)
Magnitudes: health savings

• Infants
  o Cost associated with an infant’s hospital stay immediately after birth is approximately $3,000, but $27,000 for a low birth weight infant (Kowlessar et. al., 2013)
  o Typical medical costs in first year of life are approximately $4,500 per infant. For a premature or low birthweight baby, the cost is closer to $50,000 (March of Dimes, 2008)

• Later life: diabetes
  o Average annual per person cost of diabetes is $11,000 per year (Yang et. al., 2013)
  o Lifetime costs when diagnosed at age 40 are approximately $125,000 (Zhou et. al., 2014)
Magnitudes: earnings, tax revenues, poverty

- Medicaid (Brown et al., 2016)
  - 1980s and 1990s Medicaid expansions increased government expenditures by $872 for each additional year of eligibility between age 0 and 18
  
  - Medicaid increases tax revenues by $247 (women) or $127 (men) by age 28
    - Project forward using estimates of lifetime earnings growth

  - Government recoups 56 cents of each $1 spent on childhood Medicaid by the time child beneficiaries reach age 60
Magnitudes: earnings, tax revenues, poverty

- SNAP
  - I estimate the per person cost of SNAP from conception to age five is \(~$10,000\)
  - I estimate that if SNAP were to increase later life earnings by 3% (a reasonable estimate based on existing studies) this would increase lifetime earnings by about $10,000
So what have we learned?

• Medicaid, SNAP, WIC improve child health

• Health improvements persist into adulthood

• Measures of adult self sufficiency also increase

• These programs may be cost effective investments in the future
Additional benefits: multigenerational spillovers?

- If childhood access to health and nutrition programs leads to better health and higher earnings in adulthood, these benefits may transmit to the next generation of children.

  - Economic mechanism: higher levels of parental education and earnings have been shown to have causal effects on children’s health, educational and economic outcomes.

  - Biological mechanism: animal studies show that prenatal and early life health environments have transgenerational effects.

  - Studies show that negative health shocks to humans (e.g. influenza, famine) persist to second generation’s outcomes.
Multi-generational Effects of Medicaid
(East, Miller, Page, Wherry, ongoing)

- We examine second generation health impacts of 1980s Medicaid expansions

- We use Vital Statistics birth records, which contain information about
  - Newborn birth weight and gestation
  - Mother’s state and year of birth

- Compare health outcomes for offspring of mothers with differential exposure to Medicaid during early life

- Focus on births to women born between 1979 and 1986, ages 15-27 at the time they give birth
Results

• 10 percentage point increase in mother’s prenatal Medicaid eligibility reduces the incidence of preterm birth among the second generation by 0.25 percentage points (2.3% reduction)

• 10 percentage point increase in mother’s prenatal Medicaid eligibility reduces the incidence of low birth weight among the second generation by 2.3 percentage points (30% reduction)
Interpretation

• Large magnitudes suggest complex biological and economic mechanisms likely generate policy spillovers
  o Underlying mechanisms will be the focus of future work

• Long-run impacts of health and nutrition interventions may be even larger than currently believed
  o Benefits of these programs likely underestimated

• Highlights importance of taking multi-generational effects of policy interventions into account
Conclusions

• Most evaluations of health and nutrition programs focus on their costs – particularly their work disincentives
• Increasing childhood access and generosity of health and nutrition programs may generate substantive benefits that are only beginning to be explored
• Studies using quasi-experimental strategies find that there are both contemporaneous and longer term benefits associated with these programs
• Benefits may be large enough to outweigh the program costs, even spilling over to future offspring
Table 1. Overview of Major U.S. Health and Nutrition Programs and Rules

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<tbody>
<tr>
<td>Medicaid</td>
<td>82.8 billion</td>
<td>Low-income individuals</td>
<td>Provides medical benefits to low income individuals. All states must cover a basic set of mandatory benefits (such as hospitals services and laboratory services). States may expand benefits to include additional services (such as prescription drugs and hospice care).</td>
<td>Generally defined by the relationship between Modified Adjusted Gross Income (MAGI) and the federal poverty line, with different thresholds for different groups and states. Eligibility thresholds for children range from 141% to 375% of the FPL (2016). States can also expand coverage to low income adults, disabled adults, and the medically needy.</td>
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<td>Supplemental Nutrition Assistance Program (SNAP), formerly FSP</td>
<td>33.2 billion</td>
<td>Low-income households</td>
<td>Monthly benefit issued electronically via Electronic Benefit Transfer (EBT) card account and calculated based on Thrifty Food Plan. Maximum monthly allotment through 2015: $194 for 1 person household, $511 for 3 person household, and $925 for 6 person household. Average benefit amount for FY 2015 was $126.83 per person and $257.73 per household.</td>
<td>Household gross monthly income of &lt;130% of poverty. Meet countable resource limit of $2,250 or $3,250 for elderly or disabled; TANF, SSI, and GA recipients eligible; legal, qualified aliens may be SNAP eligible; some households may be required to meet employment, service, and training requirements; individuals without a Social Security number, most postsecondary students, and strikers not eligible.</td>
</tr>
<tr>
<td>Special Supplemental Nutrition Program for Women, Infants, and Children (WIC)</td>
<td>5.6 billion</td>
<td>Low-income pregnant or postpartum women, infants (&lt;1), and children (&lt;5)</td>
<td>Food instrument or cash-value voucher (some states on EBT) to purchase specified nutritious foods rich in protein, iron, calcium, vitamins, A, C, and D; nutrition education; screening and referrals to health and other social services. Food package assignment varies by situational need.</td>
<td>Pregnant, postpartum, or breastfeeding women, infants, or children &lt; 5; must be individually determined to be at &quot;nutritional risk&quot; by a health professional; meet State residency requirement; gross income ≤ 185% of FPL.</td>
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### Table 1. Overview of Major U.S. Health and Nutrition Programs and Rules (cont.)

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<tr>
<td>National School Lunch Program (NSLP)</td>
<td>11.7 billion</td>
<td>Low-income children: 30.5 million (children: 19.8 million) receiving free lunch; 2.2 million receiving reduced price lunch</td>
<td>Nutritionally balanced daily lunches conforming to the latest Dietary Guidelines for Americans standards; 1/2 daily nutrition requirements. Avg. reimbursement rate = $3.07 per free meal, $2.87 per reduced price meal, in schools where 60% or more of meals are subsidized and meeting Healthy Hunger-free Kids Act requirements (SY15/16)</td>
<td>Free lunch if income ≤ 130% poverty; reduced-price lunch if income ≤ 185% poverty. SNAP recipients automatically qualify for free meals.</td>
</tr>
<tr>
<td>School Breakfast Program (SBP)</td>
<td>3.9 billion</td>
<td>Low-income children: 14.1 million (children: 11.1 million) receiving free breakfast; 0.9 million receiving reduced price breakfast</td>
<td>Nutritionally balanced daily breakfast</td>
<td>Child eligibility rules are the same as NSLP meeting latest Dietary Guidelines for Americans standards. Schools received $1.66 to $1.99 per free breakfast, $1.36 to $1.69 per reduced price breakfast, and $0.29 per paid breakfast, depending on overall school need (SY15/16).</td>
</tr>
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Source: Most of the information for food and nutrition programs is taken directly from Hoynes and Schanzenbach (2015).
Table 2. Estimated Effects of First Generation Medicaid Exposure on Second Generation’s Birth Outcomes

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Mean of Outcome</th>
<th>Length of Gestation</th>
<th>Preterm Birth</th>
<th>Average Birthweight</th>
<th>Low Birthweight</th>
<th>Very Low Birthweight</th>
<th>Small for Gestational Age</th>
<th>Apgar Score</th>
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<tbody>
<tr>
<td>Estimated Effect of First Generation’s Prenatal Medicaid Eligibility</td>
<td></td>
<td>0.293* (0.156)</td>
<td>-0.025* (0.013)</td>
<td>86.82** (38.30)</td>
<td>-0.023** (0.011)</td>
<td>-0.005 (0.004)</td>
<td>-0.022** (0.010)</td>
<td>0.014 (0.041)</td>
</tr>
<tr>
<td>Mean of Outcome</td>
<td></td>
<td>38.77</td>
<td>0.114</td>
<td>3259</td>
<td>0.073</td>
<td>0.013</td>
<td>0.093</td>
<td>8.851</td>
</tr>
</tbody>
</table>

Notes: Standard errors are in parentheses. * indicates statistical significance at the 10% level. ** indicates statistical significance at the 5% level. Data come from the U.S. Vital Statistics Natality Files and include all births between 1996 and 2013. Length of gestation is measured in weeks; preterm infants are born before 37 weeks (value of 1 indicates that birth was preterm, mean outcome of 0.114 implies that 11.4 percent of births are preterm); average birthweight is measured in grams; low birthweight is below 2,500 grams (value of 1 indicates a low birthweight infant, mean outcome of 0.073 implies that 7.3 percent of infants are low birthweight); very low birthweight is below 1,500 grams (value of 1 indicates a very low birthweight infant, mean outcome of 0.013 implies that 1.3 percent of infants are very low birthweight); small for gestational age infants weigh below 10th percentile given gestational age (value of 1 indicates a small for gestational age infant, mean outcome of 0.093 implies that 9.3 percent of infants are small for gestational age); Apgar score varies from 0 to 10, with 10 indicating the best infant health.