Title: Supplemental Security Income Improves the Health of Very Low Birth Weight Babies and Reduces Medicaid Costs: Evidence from New York

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Abstract

We use New York State Medicaid data to examine how the Supplemental Security Income (SSI) program, which provides cash assistance to low-income children with disabilities, affects the health of vulnerable children. We use a regression discontinuity design that exploits an SSI eligibility rule: low-income children born below a birthweight threshold (1,200 grams) are automatically eligible for SSI. We find that children who were born with a birthweight below the 1,200-gram cutoff are 93% more likely to be enrolled in SSI prior to age one relative to those born just above that cutoff. They subsequently develop fewer chronic conditions and live in higher income neighborhoods. From birth through age 8, they incur Medicaid expenditures 23% lower than do children born at weights just above the threshold. These results suggest relatively small cash transfers provided to vulnerable populations may be a cost-effective way to improve health outcomes and reduce healthcare spending.

Key word: Supplemental Security Income, cash transfer, child health

JEL code: J13, I18, I38

Introduction

A growing body of research shows that early life investments, including cash transfers to families, lead to significant long-term improvements in multiple measures of well-being: educational attainment and earnings (Hoynes, Schanzenbach, 2018), health outcomes including longevity (Aizer et al., 2016), nutrition (Milligan, Stabile, 2011; Aizer et al., 2016), mental health (Milligan, Stabile, 2011; Akee et al., 2018), and maternal mental health (Milligan, Stabile, 2011; Daley, 2017). But the process through which income improves child health is not well understood. In this paper, we exploit variation induced by a rule governing the US Supplemental Security Income (SSI) program to assess how cash transfers affect the health and utilization of Medicaid-insured children and to shed light on the mechanisms that generate these effects.

The SSI program provides means-tested cash assistance to the elderly and to individuals with disabilities, including children. The Social Security Administration (SSA) is responsible for screening applicants based on income (below roughly 80% of the federal poverty level (FPL) (Burns, Dague, 2017)), assets, citizenship, and extent of disability. In 2015, low birthweight became its own medical listing, thus those babies born below the birthweight threshold are given presumptive eligibility (Guldi et al., 2022).[1]

Eligibility for benefits as a low birthweight baby is based on weight relative to gestational age, which SSA gathers from birth certificates. The threshold is 1,200 grams up to 32 weeks of gestational age, and gradually increases at higher gestational ages.[2] For children who gain

[1] Prior to 2015, low birthweight was a presumptive disability category ("premature children") for SSI, allowing families of premature babies to be awarded cash benefits for up to six months while their applications were under review for final eligibility determination.

[2] A child born below 1,200 grams at any gestational age is eligible for SSI benefits based on SSI birthweight eligibility. At greater gestational ages, the thresholds increase to 1,250 grams at 32 weeks, 1,325 grams at 33 weeks, 1,500 grams at 34 weeks, 1,700 grams at 35 weeks, 1,875 grams at 36 weeks, and 2,000 grams at 37-40 weeks. For instance, a child weighing 1,250 grams born at 31 weeks is not eligible for SSI based on the low-birthweight eligibility criterion.

eligibility due to low birthweight, SSA conducts a Continuing Disability Review (CDR) after the child reaches 12 months of age, though, in practice, these are often delayed. Over the 1998-2008 period, CDRs usually occurred between ages 1–3 (Hemmeter, Bailey, 2015). Some evidence suggests that delays have increased for more recent cohorts (Hemmeter, et al., 2021). If an otherwise eligible child is found not to have any significant developmental delays, SSI benefits may be discontinued. In 2018, of the 17,346 children who qualified for SSI benefits based on low birthweight, only 49.8% were deemed eligible for continuing benefits (SSA, 2019). Thus, the amount of time a child receives SSI may vary based on both the child's physical condition and administrative processes.

SSI support can provide substantial income to families (Guldi et al., 2022; Duggan, Kearney, 2007). The exact amount depends on family income, derived through a complex formula (Duggan et al., 2015). In 2013, families with children receiving SSI payments received an average of $631 monthly (Hemmeter, Bailey, 2015), which is roughly equivalent to 40% of the FPL for a family of three over a year. A study by Bailey and Hemmeter (2014) using the Survey of Income and Program Participation (SIPP) data found that child SSI payments accounted for 43% of recipient household's income. Duggan and Kearney (2007), who also used SIPP data and followed families of disabled children before and after SSI participation, estimate that child SSI enrollment reduces the likelihood that children live in poverty by 11 percentage points. Their household-level fixed effects estimation finds that each additional $100 of child SSI benefits increases household income by $72, after accounting for reductions in other income-related benefits (Kubik, 1999).[3]

Cash transfers in early life may be particularly valuable to children at high risk of adverse health outcomes, such as those born at low birthweight (Black et al., 2007). Cash benefits could

[3] This reflects the program rule that a child is not able to receive benefits from both SSI and other social welfare program such as Temporary Assistance for Needy Families (TANF). (Duggan, Kearney, 2007).

improve well-being by offsetting extra disability-related expenditures or by replacing the earnings of parents who reduce work hours to take care of a disabled child (Daly, Burkhauser, 2003). While higher family income may not fully mitigate the negative effects of low birthweight (Currie, Hyson, 1999), there is some evidence suggesting that it can help.

One recent study has examined the effects of child SSI receipt on early life outcomes (Guldi et al., 2022).[4] Using a nationally representative longitudinal data set and exploiting the 1,200-gram birthweight cutoff for SSI eligibility, the authors find that low-birthweight eligibility for SSI increases the probability that families of low birthweight children benefit from SSI over the first two years of their lives by 25-30 percentage points. They estimate that enrollment in SSI benefits increases child motor skill development scores (Bayley Mental Motor scale) by 0.4-0.7 of a standard deviation and reduces maternal labor market participation on the intensive margin (54.6% of the mean of mother's weekly hours worked), but does not affect child mortality. While their data includes information on skill development and maternal labor supply, the data do not directly measure health services utilization or other health outcomes.

Our study builds on this work by using Medicaid administrative data from New York State to estimate the causal effects of SSI on a comprehensive range of outcome measures, including Medicaid costs, the incidence of chronic conditions, and characteristics of the child's neighborhood, over 8 years of follow-up. We use a regression discontinuity design and exploit variation in eligibility for SSI based on birthweight. We find that children who were born with a birthweight below the 1,200-gram cutoff (we refer to these babies as birthweight-eligible) are 93% more likely to be enrolled in SSI prior to age one relative to those born just above that cutoff. In early childhood (prior to age 6), birthweight-eligible children are significantly less likely to be

[4] A few recent studies analyze the impacts of child SSI receipt on parental labor market outcomes (Desphande, 2016; Levere, 2019).

diagnosed with both acute (infection, injury) and chronic (malnutrition, developmental delay) conditions, and are less likely to be admitted to hospital. These babies also incur 23% lower cumulative Medicaid costs from birth through age 8 than do children born just above the threshold. An additional month on SSI between birth and age 8 is associated with a 1.8%-reduction in cumulative Medicaid costs.

Statistically significant reductions in Medicaid costs occur at and above the median of the spending distribution, with the greatest impacts at the top of the Medicaid spending distribution. The impacts of SSI on subsequent Medicaid costs are especially strong for the most vulnerable subgroups: those who were initially diagnosed with congenital anomalies, who had higher cost of initial hospital stays, and who were born in lower income families. By contrast, we find that crossing the clinical standard for very low birthweight (1,500 grams), which triggers an increase in the intensity of care, significantly increases spending for initial newborn hospital stays, consistent with prior research (Almond et al., 2010; Chyn et al., 2020), but does not change SSI enrollment and has no effect on cumulative Medicaid spending. This counterfactual analysis increases our confidence that the reduced cumulative Medicaid spending we find is attributable to income received through SSI rather than differential medical inputs at birth.

Children who are birthweight-eligible for SSI develop 15% fewer new chronic conditions through age 3. We also find that, at age 8, children birthweight-eligible for SSI live in higher income neighborhoods than do those born just above the threshold. The magnitude of this effect is similar both among non-movers and among movers, suggesting that this additional income enables families to move to better neighborhoods or to remain in better neighborhoods.

Reductions in Medicaid spending associated with SSI eligibility are substantial and offset increased cash transfer payments by a ratio of 2.5:1. Our welfare analysis shows that net government costs of the SSI birthweight eligibility rule are negative. Because of the reductions in Medicaid spending, the cash transfer program more than pays for itself. In simulation analyses, we estimate that relaxing the eligibility rules to incorporate children born at slightly higher birthweights or born with higher household incomes would allow more children to benefit from the program while continuing to save taxpayers' money.

Methods

Our study uses New York State Medicaid claims data from fee-for-service enrollees and encounter data from managed care enrollees, who constitute the vast majority of beneficiaries in the state. State assessments of the quality of these managed care encounter data confirm that, in the period since 2006, data quality for fee-for-service and managed care beneficiaries was comparable[5]. Throughout the period under study (2006–2018), infants under age 1 in families with incomes under 224% FPL and children aged 1-5 with incomes under 154% FPL were eligible for Medicaid in New York State.[6] Beneficiaries did not pay premiums and faced no cost-sharing for covered services.

[5] Like many other states, New York State has gradually moved to Medicaid managed care and enrolled roughly 75% of all recipients into managed care organizations as of 2019 (https://www.kff.org/state-category/medicaid-chip/medicaid-managed-care-market-tracker/medicaid-mco-state-level-enrollment-data/). Because managed care organizations are paid on a capitated basis, which may lower the incentive for complete and accurate reporting of services provided in encounter claims, New York State has implemented a number of quality improvement activities, including reporting monthly validation and volume reports (https://www.health.ny.gov/health_care/medicaid/redesign/meds_encounter_data_validation.htm) and maintaining a compliance unit that can issue a statement of deficiency to managed care organizations that are consistently underreporting. An outside report conducted by Mathematic Policy Research (Byrd, Dodd, 2015) reported that New York State encounter data were usable, meaning they were of comparable completeness and quality to fee-for-service claims. A 2017 external quality review of the New York State Medicaid managed care organizations also reported that Medicaid managed care encounter data were in the range consistent with statewide averages (https://www.health.ny.gov/statistics/health_care/managed_care/plans/reports/docs/all_plan_summary.pdf).

[6] Beginning in January 2012, when the oldest children in our sample would have turned 6, eligibility for those ages 6–19 was increased to 154% FPL (from 100% FPL). But, as we followed-up babies who had been on Medicaid continuously for their first 8 years of lives, this policy change does not affect the sample characteristics.

Our sample consists of low-income children born in New York between 2006 and 2010 whose birthweights fell between 900 grams and 1,500 grams. The 2006 data are the earliest and the 2018 data are the latest we are able to use. As we are looking at long term outcomes 8 years out, our study sample is restricted to those born between 2006 and 2010. Our primary study sample is restricted to those enrolled in Medicaid without a lapse in coverage from birth through age 8 (we relax this restriction in sensitivity analyses below).[7] This continuous enrollment restriction means that our study sample likely includes children who are more persistently disadvantaged than the overall Medicaid child population as continuous enrollment is more common among children in lower income families[8].

Because we do not know each child's exact gestational age, following Guldi et al. (2022), we further restrict our study sample to those born at 32 weeks of gestation or earlier,[9] to limit bias due to errors in the determination of birthweight eligibility at higher gestational ages (we test if relaxing this restriction changes our results in sensitivity analyses below).[10] Our final sample includes 1,348 low birthweight, preterm births.

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[7] Among all the 537,983 babies born in 2006-2010 in New York State, 1.1% (5,278 babies) were born at birthweights between 900 and 1,500 grams. Those continuously enrolled in Medicaid for 8 years were 35.1% of the whole 2006–2010 cohort and 35.4% of babies in the 900–1,500gm birthweight bracket (the difference was not statistically significant). The share of babies continuously-enrolled in Medicaid for 3 years in the whole cohort was 57.9% – this figure is comparable to a previous study that reported 43–66% of children were continuously covered by Medicaid for two or more years in the mid-2000s (Fairbrother et al., 2007).

[8] We find that babies born in families in our sample who were enrolled in SNAP at birth (which has an income limit of about 130% FPL – well below the infant Medicaid limit of 224% FPL) were significantly more likely to remain continuously enrolled in Medicaid for 8 years than those not enrolled (48.4% among those enrolled in SNAP at birth vs. 29.8% among others).

[9] We use ICD weeks of gestation codes (ICD-9-CM diagnosis codes (765.21 (<24 weeks of gestation)–765.26 (31–32 weeks of gestation)) to restrict our main study sample.

[10] Both gestational age and birthweight independently affect child health outcomes, thus we caution readers that results from our main specification and results using the sample without the preterm restriction have different implications. In our New York State Medicaid data, among those born between 2006–2010 and at birthweights between 900 and 1,500 grams (N=5,278), 3,690 babies were born at 32 weeks of gestation or earlier. Utilizing the main regression discontinuity design (equation 1), we found that, among all the 5,278 babies born at birthweights between 900–1,500 grams, the probability of preterm birth was not significantly associated with the 1,200-gram cutoff (coefficient=-0.006, p-value=0.796). In addition, using natality information in 2010 from the Centers for Disease Control and Prevention (https://wonder.cdc.gov/natality.html), we found that the share of preterm (born at 32 weeks or earlier) babies in all births was 1.7% for all babies born in New York State (N=244,375) and 1.4% for

To examine the impacts of SSI, we exploit the 1,200-gram threshold in a regression discontinuity design that compares birthweight-eligible preterm babies to preterm babies born just above the birthweight-eligibility threshold. We use Calonico et al.'s (2017) bandwidth selection method, which yields 250–300 gram as a bandwidth, and use a 300-gram bandwidth for our main specification to maximize sample size (we also estimate the impacts of SSI on our main outcome measures with 250-gram and 200-gram bandwidth as a sensitivity check). [11] We specify the following regression:

(1) $Y_i = \alpha + \beta_1 D_i + \beta_2 BW_i + \beta_3 D_i BW_i + X_i + \varepsilon_i$

where D is an indicator that equals one if birthweight is below 1,200 grams, BW is birthweight in grams (centered at 1,200 grams) of child i, and X_i is a vector of demographic factors including race/ethnicity (non-Hispanic White, non-Hispanic black, Hispanic, non-Hispanic other race/ethnicity), gender, and birth month and birth year fixed effects.[12] We also control for separate gram trend terms ($D_i BW_i$) below and above the threshold by interacting the treatment group indicator and the birthweight measure (Almond et al., 2010). In addition, our main specification includes full interactions between birth year dummies, gender, and race/ethnicity.

those covered by Medicaid (N=89,295). The percentage of babies born at low birthweight (<1,500 grams) was 1.5% for all babies born in the state and 1.4% for babies covered by Medicaid.

[11] Appendix Figure 1 presents the birthweight histogram around the 1,200-gram threshold among our study population and reveals heaping at 5-gram and 10-gram multiples. First, we test manipulation of birthweight around the 1,200-gram threshold for SSI eligibility by using Cattaneo et al.'s (2015) manipulation test with local polynomial density estimation and find no evidence of manipulation around the 1,200-gram cutoff (p=0.849) (right panel of Appendix Figure 1 shows that excess mass, which is statistically insignificant, is on the right side of the 1,200-gram cutoff). Second, following Barreca et al. (2011), we present unadjusted means of our main outcome measures (SSI enrollment, cumulative Medicaid spending, and NICU cost) across the birthweight distribution to address the possibility of heaping-induced biases. In particular, in Appendix Figure 2, we show that those at the 1,200-gram heap do not incur Medicaid spending substantially higher or lower than do nearby observations. In addition, we specify main regressions excluding those whose birthweights fall between 1,195 and 1,205 grams to address the possibility of birthweight manipulation favorable to be below 1,200 grams (Barreca et al., 2011).

[12] Including birth year and birth month fixed effects controls for socioeconomic shocks and potential fluctuations in the rate at which SSA's conducts continuing disability reviews (Hemetter, Bailey, 2015).

Our primary outcome measures (Y_i) include SSI enrollment measures, both on the extensive and the intensive margins, and total Medicaid payments.[13] We show the effects of birthweight eligibility for SSI on cumulative SSI enrollment and Medicaid costs from birth through age 8, and, based on findings of a previous study that most low-birthweight child SSI enrollees received their first CDR at age 1-3 (Hemmeter and Bailey, 2015), we also report the effects in 3-year age intervals (age 0-3, age 3-6, and age 6-8).

Our main specifications report intent-to-treat (ITT) estimates of the impacts of birthweight-eligibility for SSI. Because the Medicaid income eligibility threshold for infants (254% FPL) is well above the eligibility thresholds for SSI (roughly 80% FPL), and because SSI has additional citizenship and asset requirements, many birthweight-eligible babies will not be eligible for SSI, while some children born above the birthweight threshold will be eligible for SSI because of other conditions (such as congenital anomalies or developmental delay). We therefore report treatment on the treated (TOT) estimates of the effect of additional months of SSI on cumulative Medicaid costs using a fuzzy regression discontinuity design. We estimate TOT effects in a two-stage least squares framework where the length of SSI spells is estimated using the 1,200-gram threshold as the instrument in the first stage.

We explore the effects of birthweight eligibility for SSI on the development of chronic medical conditions over the study period. We identify these conditions through primary diagnosis codes and group the conditions that are common in children using the Clinical Classifications Software (CCS) system (Case et al., 2002; Clark et al., 2019). We also report results for specific conditions such as the incidence of inadequate nutrition (malnutrition), maltreatment (injury), and infection, which are most likely to be directly affected by household resources (Lee, Mackey-

[13] Our data contain all payment information including, for those enrolled in managed care, the managed care plan's negotiated payment amount.

Bilaver, 2007; Schnitzer et al., 2011; Phil, Basso, 2019). To address precision issues associated with multiple hypotheses testing, we created a health outcome index (all 18 conditions studied were grouped into a single hybrid factor) using principal components analysis so that each index has a mean of zero and standard deviation of one. We measure healthcare utilization as hospitalization utilization and specialist visits.

We use information on residential addresses to explore the effect of SSI on residential mobility and neighborhood characteristics. We characterize mobility as the probability of moving (any change in zip code during the study period), number of moves (total number of zip code changes), and logged distance moved in miles (great-circle distance between centroids of zip code tabulation areas). We match each child's residential address to the American Community Survey (ACS) five-year estimates of neighborhood socioeconomic status to capture changes in the neighborhood environment each child experienced. We use census tracts as a proxy for neighborhoods and utilize the 2009 ACS five-year estimates (covering 2005-2009) to describe neighborhood characteristics at birth and the 2017 ACS five-year estimates (covering 2013-2017) to measure the characteristics of the neighborhoods where children lived at age 8.[14] We calculate net changes in poverty level, net changes in educational attainment (the share of adults who graduated high school, and the share of adults who earned bachelor's degree), and changes in median household income (expressed as Consumer Price Index (CPI)-adjusted $2009).

In addition, we explore whether child SSI benefits affected maternal health outcomes, as prior research has shown that cash transfers to Canadian households improved maternal mental health (Milligan, Stabile, 2011; Daley, 2017) and fertility (Milligan, 2005). We estimate the impacts of birthweight-eligibility on mothers' mental health, fertility, and healthcare utilization

[14] We directly linked each street address of residence to census tracts using the Census Bureau's address batch (https://geocoding.geo.census.gov/geocoder/geographies/address?form).

(Almond, Currie, 2011). We apply an algorithm linking mothers to the 2006-2010 cohort through administrative case identification numbers and birth dates (Knox et al., 2019). Using this method, we were able to match mothers to 94% of the children in the sample.

Results

Table 1 reports summary statistics. The first column shows means for the whole sample. The second and third columns report means for the birthweight-eligible sample and for those with birthweight just above the 1,200-gram cutoff. Our study sample is 47% female, 34% non-Hispanic White, 22% non-Hispanic Black, 31% Hispanic, and 51% New York City residents.

Consistent with our expectations, SSI enrollment is significantly higher among children who are born birthweight-eligible for SSI. By age 1, 59% of birthweight-eligible children were enrolled in SSI, compared to 17% of children born at birthweights above the threshold. Average SSI spells by age 1 are 5.1 months for those who are birthweight-eligible and 1.2 months for those above the cutoff. Appendix Table 1 further explores the differences in SSI uptake by age 1 by demographic characteristics of the child.

Figure 1 plots local linear regression-fitted lines, estimated separately on each side of the threshold, of cumulative SSI enrollment from birth through age 8 and mean values of outcomes for each 20-gram bin (using a 300-gram bandwidth, quadratic function of the running variable, and triangular kernel function). The figure shows that the association of birthweight with SSI enrollment, both in terms of the probability of SSI enrollment and SSI spells, is negative and linear in general, but discontinuous at the 1,200-gram birthweight eligibility threshold (recall that not all babies born below the birthweight-eligible cutoff are eligible for SSI due to income, citizenship, and asset limits).

In Appendix Table 2, we describe the SSI enrollment trajectories of the two groups from birth through age eight. Children born below the birthweight-eligibility threshold are more likely than their peers born above the cutoff to ever be on SSI, and enroll earlier in life, generally before their first birthdays. Among all children born birthweight-eligible who ever enrolled in SSI (75% of all children born below the cutoff), 79.2% enrolled in SSI by age 1 and for those initially enrolled before age 1, the median age at enrollment was three months. By contrast, among those born above the cutoff who ever enrolled in SSI (36% of all children born above the cutoff), more than half enrolled in SSI for the first time after age one. Children born birthweight-eligible who enrolled in SSI and lost their benefits typically lost benefits between ages 2-4, consistent with the findings of Hemmeter and Bailey (2015).

Appendix Table 3 presents results from first stage regressions of SSI enrollment measures (both ever on SSI and the number of months on SSI) on the indicator that birthweight is below 1,200 grams by age interval. Consistent with the findings in Appendix Table 2, the birthweight-eligibility cutoff is most strongly associated with SSI enrollment measures early in a child's life. Being born birthweight-eligible increases SSI spells by about 2 months per year through age three. The magnitude of this effect declines by half and loses statistical significance at older ages.[15]

Table 2 and Figure 2 present estimated ITT effects of birthweight eligibility for SSI (β_1 from equation 1) on SSI enrollment and healthcare utilization. Birthweight eligibility for SSI increases SSI spells by 102% between ages 0-3 and increases SSI spells by 24% between ages 3-6. Aggregate Medicaid expenditures through age 8, which capture utilization across all conditions, are 21-26% lower among those birthweight-eligible for SSI. Birthweight-eligibility for SSI also

[15] When we increase sample size by omitting the preterm restriction (born at 32 weeks or earlier), we find that birthweight-eligibility for SSI eligibility has significant effects on SSI enrollment at least through age 8, though the effect size decreases by about half at around age 3 when typical CDRs have been completed.

decreases the probability of hospital utilization (excluding initial stays at birth) by 10.6 percentage points (14.7% of the mean) by age 3. Children birthweight-eligible for SSI spend 32.6% fewer total days in the hospital through age three. Specialist visits are also substantially lower among those born birthweight-eligible (-40 to -63% of the mean).

We also report results from two-stage least square regressions (instrument: indicator whether birthweight is below 1,200 grams) on logged cumulative Medicaid costs in Appendix Table 4. To increase precision, we also present results using the sample without the preterm restriction. We present first stage and second stage regression coefficients, where the first stage coefficients are cumulative SSI spells for age intervals indicated in the first column. The second stage shows the treatment-on-the-treated estimated effect of an additional month on SSI on cumulative Medicaid costs through age 8. Results shown in the last row indicate that, from birth through age 8, an additional month on SSI is associated with a 1.8%-reduction in cumulative Medicaid costs. We find that the magnitude of the effect of an additional month on SSI is much larger in early life (-12.5% through age 1) and gradually decreases as a child ages, corroborating our identification assumption that the Medicaid cost-saving effects of SSI we observe are primarily driven by exogenous variation in exposure to SSI cash benefits received in early life.

In Appendix Table 5, we present a full set of estimated ITT effects of birthweight eligibility for SSI on the probabilities of having selected health conditions, measured as having any visits with primary diagnoses related to each condition. Results show that the incidence of malnutrition and urinary tract infection prior to age three are significantly lower below the threshold. Between ages 3-6, those birthweight-eligible for SSI are less likely to have a diagnosis of developmental delay and are 10 percentage points less likely to be receiving special education than their counterparts born above the threshold. We find that birthweight-eligibility for SSI is associated with a decline of 0.16 of a standard deviation in the health outcome index through age 8 (marginally significant), with a bigger effect found at ages 0-3.

Figure 3 presents regression coefficients and 95% confidence intervals for the estimated impacts of birthweight eligibility for SSI on logged aggregate Medicaid expenditures from birth to age eight across a range of sub-populations. On average, SSI reduces Medicaid expenditures by 22.9%, but the impacts vary with neighborhood socioeconomic status and health endowments at birth. Among babies born to families in the lowest-income tercile neighborhoods, birthweight-eligibility for SSI is associated with a 50%-reduction in Medicaid spending, while the coefficients are smaller for those born in middle income tercile neighborhoods (-30%) and those born in the highest income tercile neighborhoods (-20%). Among babies born in families enrolled in SNAP (which has a much lower income threshold than infant Medicaid), birthweight-eligibility is associated with a 27.7% reduction in Medicaid expenditures, while the impact for babies whose families were not enrolled in SNAP at birth is smaller (-17.6%) and not statistically significant.[16] Both the neighborhood and SNAP results suggest that the health impacts of the SSI cash benefit are greatest for babies born to the lowest income families. Finally, birthweight-eligibility for SSI substantially reduces Medicaid expenditures among babies who incurred the highest costs for their initial hospital stays (by 53% for the highest NICU cost tercile), while the effect among babies with lower costs for initial stays is smaller and statistically insignificant (-25.9%), suggesting that the marginal return to the cash benefit for low birthweight infants is biggest for babies with the greatest medical needs at birth.

[16] We also present estimated ITT effects of birthweight eligibility for SSI on cumulative SSI enrollment and Medicaid costs from birth through age 8 by SNAP enrollment at birth in Appendix Table 6 (to increase precision, we also show results from the sample without the preterm restriction in the last three columns). SSI-eligible babies born in households enrolled in SNAP at birth are more likely than peers born in non-SNAP households to enroll in SSI (consistent with the lower income eligibility limit for SNAP). The effect of birthweight eligibility for SSI on Medicaid costs is also bigger and more likely to be statistically significant for those born in SNAP households.

Mechanisms

Our results indicate that birthweight-eligibility for SSI reduces the incidence of both acute (infection and injury) and chronic (malnutrition and developmental delay) conditions in early life, and leads to substantial reductions in Medicaid spending. To further investigate the mechanisms through which birthweight eligibility for SSI affects the health of children, we first explore the role of chronic conditions.

Currie and Stabile (2003) hypothesize that financial resources may help children avoid adverse health shocks. In Table 3, we find that birthweight eligibility for SSI significantly reduces the number of new chronic conditions[17] diagnosed through age three (the age at which the differential in SSI between birthweight-eligible and birthweight-ineligible children is the largest (Appendix Table 3)) by 0.21 (15% of the control group mean) (Figure 4). We also find that children who were not birthweight-eligible for SSI were diagnosed with chronic conditions 1.7 months earlier (statistically insignificant), on average, than children who were birthweight-eligible.

Table 4 presents ITT effects of low-birthweight eligibility for SSI on the mobility of families of affected children. We find evidence that SSI does not significantly affect the probability of moving or number of moves by age 8. However, children born birthweight-eligible for SSI saw an increase in census tract level median household income about $2,400 greater than did children born below the cutoff (Figure 4).[18] This increase in neighborhood income occurs both among non-

[17] These include nine conditions requiring regular follow-ups and medication: malnutrition, anemia, obesity, vision defect, hearing defect, asthma, genitourinary tract diseases, and developmental delay.
[18] Note that the mean of changes in median household income of all the 4,919 census tracts in New York State during the same period was $548 (median: $439, interquartile range: -$14,695 to $15,467) and the control group mean change among our study population is $817. The mean of Census tract income in our sample was $40,548 (babies born below the cutoff) and $40,958 (babies born above the cutoff) at birth (from the 2009 ACS). The change in median neighborhood income for those below the cutoff was 6% of mean census tract income, while the change for those above the cutoff was about 2% of mean census tract income.

movers (N=780) and among movers (N=497), suggesting that the additional income enables families to move to better neighborhoods or to remain in better neighborhoods. Low-birthweight eligibility for SSI is also marginally significantly associated with an increase in bachelor's degree completion rate at the census tract level. We note that these estimated neighborhood change effects, while all in a consistent direction, become statistically insignificant after Bonferroni correction for multiple hypothesis testing.

We compare these estimated census tract income changes to estimated changes in family income among SSI recipients to assess the plausibility of these neighborhood effects. Over a year, the family of a child on SSI receives an average of $7,572 in income (Hemmeter, Bailey, 2015), likely higher in New York State because of the State supplement. Scaling this by the 15% increase in SSI enrollment among birthweight-eligible babies (Table 2) implies that average SSI income for those born birthweight-eligible is about $1,135 per year for the first three years, and about half that (because of disenrollment from SSI) subsequently. Given that only a share of income (below 50%) is likely spent on rent, these figures suggest that birthweight-eligible families could, on average, afford to live in neighborhoods with average incomes about $2,300 higher, consistent with our estimates of neighborhood income changes. XX

Table 5 reports the distribution of the birthweight-eligibility effects from birth through age 8. Reductions in Medicaid costs occur across the distribution of spending, at and above the median, with the greatest impacts at the top of the Medicaid cost distribution (Panel A). Birthweight eligibility for SSI is not significantly associated with changes in Medicaid costs below the 25th percentile, but the estimated cost-saving impacts of SSI are 21.6% at the median, 26.5% at the 75th percentile, and 34.9% at the 90th percentile. We also find similar distributional effects for the number of hospitalizations (Panel B)[19] and specialist visits (Panel C).[20] In contrast, the effects of SSI on changes in neighborhood median income are relatively similar across the whole distribution with impact size declining by about a quarter across the quantiles (Panel D). This result, coupled with our finding in Table 4 that SSI receipt is associated with improvements in neighborhood environments for both movers and non-movers, suggests that at least part of the increased income associated with SSI is used to pay for better housing.

We also test whether receipt of SSI changed preventive care utilization (Sohn et al. 2011). Appendix Table 8 reports the results from regressions of on-time vaccination rates and total vaccinations received[21] on birthweight eligibility for SSI. We do not find that birthweight eligibility for SSI significantly changes vaccination rates.[22]

We estimate ITT effects of birthweight-eligibility for SSI on cumulative maternal health outcomes and fertility over the first 8 years of the child's life in Appendix Table 9. We find no evidence of significant impacts on maternal mental health, fertility, substance- or alcohol-related disorders. A child's birthweight eligibility for SSI is negatively associated with mother's Medicaid costs, and with the probability of anxiety, pregnancy, and hospitalization utilization, but none of these results are statistically significantly different from zero. While we do not observe mother's

[19] Quantile regression coefficients for the number of hospitalizations at 10th and 25th percentiles are small mainly due to the right-skewed distribution of the outcome measure. Average number of hospitalizations through age 8 in the lower half of the hospitalization distribution is 0.718 (standard deviation=0.453) below the 1,200-gram cutoff and 0.733 (standard deviation=0.443) above the cutoff. In contrast, in the upper half of the distribution, average number of hospitalizations through age 8 is 2.728 (standard deviation=2.925) below the cutoff and 3.488 (standard deviation=2.753) above the cutoff.

[20] In line with these findings, Appendix Table 7 shows the ITT effects of birthweight eligibility for SSI on cumulative Medicaid costs through age 8 (excluding Medicaid cost incurred during initial hospital stays), probability of hospitalization, and length of stay are bigger for vulnerable subgroups with higher medical needs at birth – those who were initially diagnosed with congenital anomalies or those with higher costs for initial hospital stays.

[21] The American Academy of Pediatrics (AAP) and the Advisory Committee on Immunization Practices (ACIP) recommend that children should be given 20 immunizations after birth: 3 for Hepatitis B, 4 for DTaP, 4 for Haemophilus Influenza, 4 for polio, 2 for MMR, and 2 for varicella.

[22] Our control group mean (4.5%) of "on-time" vaccination rates is quite low, but is not substantially different from Luman et al.'s (2005) estimate in New York State (7.3%) based on the 2000-2002 National Immunization Survey.

labor supply, mother's continuous enrollment in Medicaid or SNAP is likely to be correlated with lower labor market participation. In an unreported analysis, we regress the mother's probability of continuous enrollment in Medicaid on child's low-birthweight eligibility for SSI and find that these associations are negative, though statistically insignificant. Similarly, there is no significant relationship between child's eligibility for SSI and mother's enrollment in SNAP. Taken together, our results fail to provide evidence that SSI benefits associated with child's birthweight eligibility for SSI leads to substantial changes in household earned income.

Overall, we find evidence that a reduction in the number of chronic conditions experienced in early life and improvements in neighborhood environment are potential mechanisms through which income enhancement through SSI affects child health. Notably, we find that SSI improves health among those with high medical needs, while the positive impacts of SSI on neighborhood environment are similar across the whole distribution.

Robustness

We conduct a series of counterfactual analyses to assess the robustness of our findings (Table 6). First, we specify the same regression discontinuity approach described above at the very low birthweight baby cutoff (1,500 grams) to estimate reduced-form effects of the clinical cutoff on SSI enrollment, cumulative Medicaid costs from birth through age 8 excluding costs for initial hospital stays at birth, and Medicaid spending for initial stays (Panel A). Previous studies show that crossing the very low birthweight threshold leads to added medical inputs at birth, reduces mortality, and improves academic achievement in school (Almond et al., 2010; Bharadwaj et al., 2013; Chyn et al., 2020). We find that crossing the 1,500-gram cutoff does not change SSI enrollment or cumulative Medicaid spending post initial hospital stay among those continuously enrolled in Medicaid for 8 years, but, in line with prior studies (Almond et al., 2010; Chyn et al., 2020),[23] significantly increases spending for initial newborn stays.

Second, in Table 6 Panel B, we report coefficients on costs for the initial hospital stay for our main study population (birthweights between 900 and 1,500 grams). Because most preterm and extremely low birthweight babies are initially admitted to neonatal intensive care unit, where there are no obvious mechanisms for family income to affect outcomes (conditional on Medicaid enrollment), we should find a null impact on Medicaid costs for this initial hospital stay.[24] Our results indicate that the 1,200-gram birthweight eligibility cutoff does not meaningfully or significantly change initial Medicaid costs (Appendix Figure 3). These results increase our confidence that the reduction in cumulative Medicaid spending we find is not primarily driven by differential medical inputs at birth but is attributable to differences in SSI enrollment caused by the SSI birthweight-eligibility rule.

We present estimated ITT effects of low-birthweight eligibility for SSI using alternative specifications in Table 7. The second and third columns show estimation results using narrower birthweight bandwidths (250 & 200 grams). Although standard errors are bigger due to smaller sample size, results are qualitatively similar to our main specification. In our main estimates, we restrict the study sample to those born at 32 weeks of gestation or earlier. We compare ITT

[23] Though estimates are not directly comparable due to sample restrictions (previous studies include all infants, while this study uses (alive) babies continuously on Medicaid for 8 years) and definition of costs (previous studies use hospital charges, while our study uses Medicaid payments), our figure ($6,845) is not substantially different from $9,450 (Almond et al., 2010) and $3,470 (Chyn et al., 2020).

[24] While in the hospital, families of eligible infants receive about $30 per month. Because preterm babies born at 32 weeks or earlier are highly likely to develop respiratory distress due to a deficiency of pulmonary surfactant, initial hospital costs are significantly higher for this population compared to full-term babies. Average hospital costs and length of stay among our study population (preterm infants whose birth weight ∈ (900, 1500)) are $105,815 (median=$87,831) and 56 days (median=50 days). Average hospital costs and length of stay among all newborns in the U.S. whose birthweights are lower than 1,500 grams were $76,700 and 42.6 days in 2011 (AHRQ, 2013). In California, average hospital costs and length of stay ranged from $52,000 to $92,700 and 36.5 days to 55.2 days among newborns whose birth weight ∈ [1000, 1500] in 1996 (Gilbert et al., 2003).

estimators of the impacts of SSI between the sample restricted to preterm birth (N=1,348) and the sample without the preterm birth restriction (N=1,871) in the fourth column and find that the results do not change substantially.

To address the possibility of errors in calculating the weight of newborns especially near the 1,200-gram cutoff, we exclude those whose birthweights fall between 1,195 and 1,205 grams (fifth column). The sixth column reports results from non-parametric local linear regressions with a quadratic function of birthweight and triangular kernel function. In the next column, we report results from regressions that exclude all utilization measures and diagnosis indicators prior to age six months. For part of the period we study, infants born below the 1,200-gram threshold in New York State were mandated to be covered by fee-for-service rather than managed care through age six months (Lee, 2020).[25] Consistent with Lee's (2020) analysis utilizing New York Healthcare Cost and Utilization Project (HCUP) data, which showed that the mandated exclusion from managed care based on birthweight was not significantly associated with initial health outcomes including mortality and readmission rates, the results in this specification are unchanged (and, in unreported analyses, we find no effects of SSI on the main outcome measures through age six months). In the last column, we add delivery hospital fixed effects to see if quality or intensity of initial care changes the effects of SSI on outcome measures in later life[26]. Overall, across the columns, results are qualitatively similar to our main specification.

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[25] We also specify a regression that excludes all utilization measures and diagnosis indicators before the first three months of life in an unreported analysis. Month three is the median at which birthweight-eligible infants awarded SSI before age 1 began to receive benefits. We find that results are unchanged.

[26] In Appendix Table 10, we add delivery hospital fixed effects to regressions of SSI enrollment measures over the first 3, 6, 9, and 12 months of children's first lives on the 1,200-gram threshold for SSI eligibility, to see whether certain hospitals do better at getting birthweight-eligible babies enrolled in SSI. Results show that crossing the threshold significantly increases enrollment in SSI as early as 3 months of age and its estimated impact does not change when delivery hospital fixed effects are included, implying that delivery hospitals are not significantly associated with SSI enrollment of children eligible for SSI based on the low-birthweight threshold.

In Appendix Table 11, we additionally test whether our sample restriction (continuous enrollment from birth through age 8) resulted in selective sampling bias at or around the 1,200-gram cutoff. We find that, among all preterm babies (32 weeks of gestation or earlier) born in 2006-2010 whose birthweight fall between 900 and 1,500 grams (N=3,690), the birthweight-eligibility cutoff is not meaningfully or significantly related to the probability of continuous enrollment in Medicaid through age three, six, or eight. In addition, though enrolling in SNAP at birth (indicating lower family income level) is significantly related to continuous Medicaid enrollment, the coefficient on the interaction between the cutoff and enrollment in SNAP at birth is insignificant. These results indicate that there is no systematic difference in socioeconomic status at the birthweight-eligibility threshold in the Medicaid population who experienced lapses in Medicaid coverage. In addition, Appendix Table 12 reports estimated impacts on main outcomes from birth through age 3 with study samples varying by different continuous enrollment restrictions (for instance, results in the first column shows ITT effects of SSI using the larger sample continuously enrolled in Medicaid through age 3 and those in the last column shows results using the smaller sample continuously enrolled in Medicaid through age 8). Moving from the sample continuously enrolled in Medicaid for 3 years to the sample continuously enrolled for 8 years (our main study sample), coefficient estimates on cumulative Medicaid costs increase slightly, indicating that more vulnerable children are likely to be on Medicaid longer, but, in general, we find that all significant findings remain unchanged.

Lastly, in Appendix Table 13, we replicate our main analysis of the ITT effect of SSI on enrollment measures and cumulative Medicaid costs using an extended sample (year 2006–2012 birth cohort) over 6 years of follow-up (as the 2018 data are the latest we can use). Compared to the results using our main study population (the 2006–2010 cohort), estimates using the extended sample show similar effects with higher precision.[27]

Implications and External Validity

Our study provides a strong economic argument for SSI given the high Medicaid cost burden for low birthweight, preterm infants. New York State Medicaid spent $5.87 billion on the 2006-2010 birth cohort (continuously enrolled in Medicaid for 8 years, N=185,022) through age 8; within this group, the Medicaid costs for the 0.7% of the cohort who were preterm infants with birthweights between 900 and 1,500 grams (N=1,348) totaled $233 million, that is 4% of the cohort's total Medicaid spending. Our back-of-the-envelope calculation based on the average monthly SSI benefit (approximately $600) and the average impacts of the 1,200-gram cutoff on SSI spells by age 8 (10.4 months) indicates that average SSI benefits provided to these children ($6,240) are far smaller than the reduction in Medicaid costs ($15,807) achieved per beneficiary.[28] Our results thus add to a growing body of evidence that health shocks that occur in early childhood, which may have long-term negative impacts on health and human capital, can be remediated by unconditional cash transfers targeting vulnerable children (Almond, Currie, 2011).

What might happen if eligibility for SSI were extended to families of children with slightly higher birthweights or those with higher incomes? To get a sense of how the net costs of SSI benefits to the government change as birthweight cutoffs rise, we first estimate the treatment effect derivative (TED) following Dong and Lewbel (2015). TED is a non-parametrically-estimated derivative of the regression discontinuity treatment effects at the threshold with respect to the

[27] Because our purpose was to follow vulnerable babies as long as possible, we used the 2006–2010 birth cohort as our main study sample.
[28] We multiply the estimated impacts of SSI on Medicaid costs by age 8 (-22.9% on average) by the average Medicaid costs incurred after initial hospital discharge of the control group ($69,057).

forcing variable (in other words, it is the coefficient on the interaction term between the low birthweight threshold indicator and continuous birthweight measures), and can be used to test whether our treatment effects are locally consistent. The estimated TED for logged cumulative Medicaid costs by age eight among our study sample is 0.003 (standard error=0.031, p=0.930), implying that the treatment effect of SSI would be constant if the birthweight threshold were slightly increased.

Based on this finding, we estimate net costs by varying birthweight cutoffs for SSI (Appendix Figure 4). We define net cost per child as average SSI benefits provided to eligible children (average SSI spells (10.4 months) multiplied by average monthly SSI benefits ($600)) minus estimated Medicaid costs by age 8 (incurred after initial hospital stay) saved through SSI following Hendren and Sprung-Keyser's (2020) definition of the net cost as a program's own spending combined with the policies' government-budget fiscal externalities. To calculate reductions in Medicaid spending, we use the constant regression discontinuity treatment effect (-0.26 log points) both below and above the 1,200-gram cutoff based on our finding of near-zero TED.[29] First, results indicate that, assuming positive long-term impacts of cash transfer on human capital accumulation based on the literature (Hoynes, Schanzenbach, 2018), this intervention has positive benefits and negative net costs, yielding an infinite Marginal Value of Public Funds (MVPF), which is the ratio of benefits (willingness to pay) to net government cost (Henden,

[29] The sample used for the calculation below the cutoff consists of babies enrolled in SSI before age one (assuming that those in this group were enrolled because of the low birthweight eligibility for SSI). Because their Medicaid costs already reflect a portion of spending saved because of SSI, we first calculate how much their Medicaid costs would be without SSI benefits ($ObservedCost = RealCost * (1 + e^{EstimatedEffect})$), thus the calculated Medicaid saving below the cutoff is the difference between observed Medicaid costs and (estimated) Medicaid costs absent the program. The sample used for the calculation above the cutoff consists of infants never enrolled in SSI. Thus, the calculated Medicaid saving above the cutoff is their observed cost multiplied by $e^{EstimatedEffect}$. We exclude NICU costs from the calculation because our findings show that SSI cash benefits do not affect these costs.

Sprung-Keyser, 2020).[30] This suggests that the SSI program for low-birthweight babies more than pays for itself. In addition, estimated net costs gradually increase in birthweight from around -$80,000 at birthweights of 500 grams or below, but the slope of the net cost graph becomes smaller as birthweights increase. In particular, net costs of SSI to the government do not exceed the zero point until birthweight reaches 1,700 grams, suggesting that marginally extending the birthweight eligibility for SSI would benefit more children without increasing taxpayer burden.

Appendix Figure 5 shows average net costs of SSI to the government by neighborhood income level. As before, net cost is defined as average SSI benefits provided to eligible children minus estimated Medicaid savings through age 8 (incurred after initial stay). To address SSI's heterogenous impacts on Medicaid spending (Figure 3), we weight coefficients by the share of vulnerable children in each income bracket. First, we use principal components analysis to create a single hybrid factor representing each child's vulnerability (grouped independent variables include Medicaid costs for initial hospital stays, an indicator for SNAP enrollment at birth, and census tract median income, poverty rate, and college graduate rate). We find that coefficients on SSI's impacts on cumulative Medicaid costs are heterogenous across this vulnerability index[31]; -7.4% for those with index values lower than -1, -19.4% for those with index values between -1 and zero, -24.1% for those with index values between zero and one, and -34.0% for those with index values greater than one. In each income bracket, we construct coefficient estimates weighted

[30] Note that we are not able to comprehensively estimate the benefit side because we do not compute a mortality-reduction effect or the effect of the program on future earnings. Though we are not able to directly look at earned income information, we find that SSI cash benefits to babies do not significantly change continuous Medicaid enrollment of their mothers, indicating that household earned income does not substantially increase. In addition, the SSI benefit provided to a child can reduce the TANF benefit amount that a family receives (Kubik, 1999), which would further decrease the net cost of SSI to the government.

[31] The index has a mean of zero and a standard deviation of one. Higher index scores indicate that a child is more vulnerable. The index weights (component score coefficients) are 0.013 for NICU costs ($), 0.046 for SNAP enrollment at birth, -0.314 for neighborhood median income, 0.292 for poverty rate, and -0.279 for college graduate rate.

by the share of children born below the 1,200-gram cutoff and enrolled in SSI before age 1 in each vulnerability group and the coefficients associated with each value range of the vulnerability index.[32] In general, Appendix Figure 5 shows that net costs increase in neighborhood income (the slope of a linear function is about 0.22) and that the share of SSI enrollees among birthweight-eligible infants is negatively associated with neighborhood income level, as expected. We do not have information on family income, though we estimate that the correlation between household gross income and neighborhood (Public Use Microdata Areas (PUMAs)) median income for Medicaid enrollees in New York State (using the 2018 ACS 5-year estimates) is 0.24. Using this figure, we rescale the association of income with net costs to assess the implication of making SSI income eligibility somewhat more generous. Our calculation shows that enrolling families of birthweight-eligible children whose income is about 50% higher than the current income limit for SSI (about 80% of FPL (Burns, Dague, 2017), corresponding to $16,000 for a family of three in 2020) would increase net costs by $8,800, but this would still mean that the program had overall net costs that were negative for all eligible children born below the 1,200-gram cutoff.

Discussion and Conclusions

Children in poor families are subject to more and worse negative early-life shocks (Almond, Currie, 2011). This study finds that being born below the 1,200-gram cutoff for SSI eligibility significantly increases child SSI enrollment, improves the health of affected children, and reduces Medicaid costs. We find evidence suggesting that a reduced likelihood of developing chronic

[32] For instance, for children in the income bracket <$20,000, 4.2% are in the lowest index score group and 58.7% are in the highest index score group (weighted coefficient for this group is -28.5%). In contrast, for children in the highest neighborhood income group, 43% are in the lowest index group but only 0.5% are in the highest vulnerability index group, yielding a weighted coefficient as -14.9%.

conditions and improved neighborhood environments are potential mechanisms through which the enhanced family incomes achieved through SSI affect child health.

We find that SSI reduces the probability that a child is subject to health shocks in early childhood, consistent with previous American and Canadian studies (Case et al., 2002; Currie, Stabile, 2003). The connection between income, household goods, and medical conditions could occur in many ways. For example, Jones et al. (2019) find that additional income through refundable child benefits in Canada led to increased household expenditures on non-durable goods. Such purchases might include, for example, increased spending on diapers, leading to an increased frequency of diaper changes in infants under 3. The medical literature indicates that urinary tract infections are higher in infants whose diapers are changed less frequently (Sobowale et al., 2021) and we find that the low-birthweight eligibility for SSI reduced the incidence of urinary tract infection among infants under 3.

Our results are limited by a relatively small sample size, which might contribute to large standard errors and imprecisely estimated coefficients. We are also limited in our ability to estimate health impacts in the longer term beyond age 8. As children continuously covered by Medicaid are more likely to be disadvantaged than those with a shorter spell of Medicaid enrollment, our results may not be generalizable to the general Medicaid population.

Despite these limitations, our study, using a large cohort of low birthweight infants in New York State, documents the causal impacts of SSI on a range of measures of child health. We show that SSI benefits are associated with better health outcomes and lower medical expenditures, suggesting that relatively small cash transfers provided to vulnerable populations may be a cost-effective way to improve health outcomes and reduce healthcare spending.

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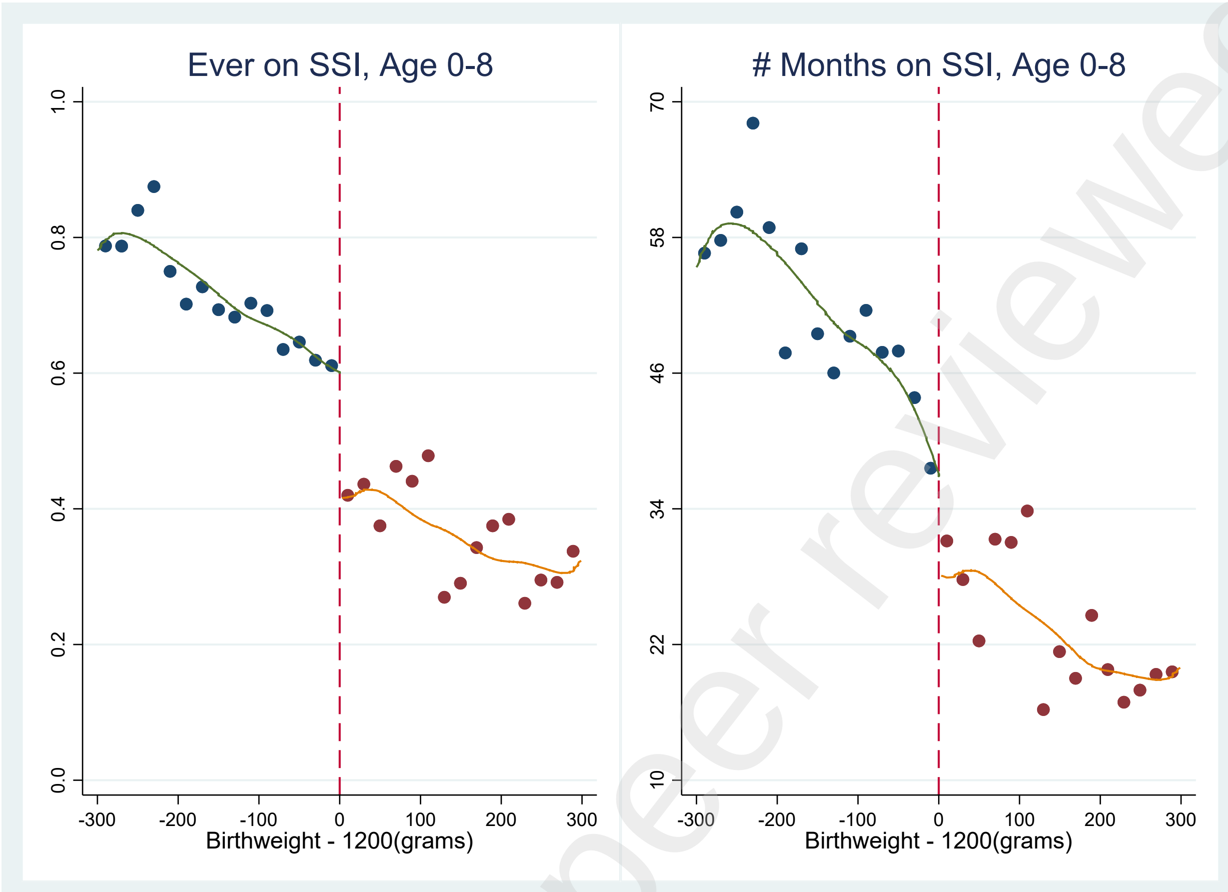


Figure 1. Birthweight eligibility and SSI enrollment by age 8.
N=1,348.
Figures plot local linear regression fitted lines, estimated separately on each side of the threshold, along with mean values of outcomes for each 20-gram bin. A 300-gram bandwidth and triangular kernel function are used. The running variable is birthweight centered at 1,200 grams.

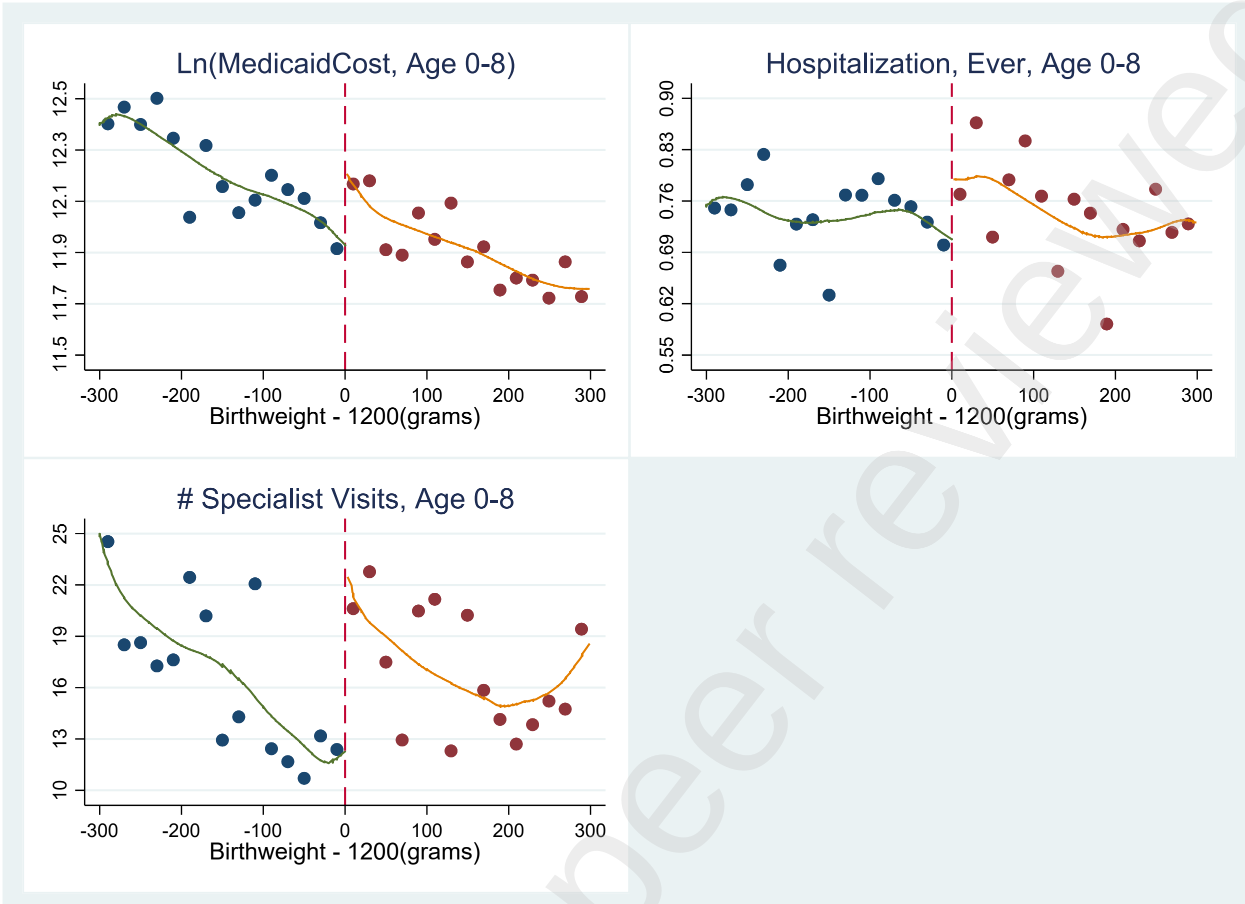


Figure 2. Effects of birthweight eligibility for SSI on healthcare utilization.
N=1,348.
Figures plot local linear regression fitted lines, estimated separately on each side of the threshold, along with mean values of outcomes for each 20-gram bin. A 300-gram bandwidth and triangular kernel function are used. The running variable is birthweight centered at 1,200 grams.

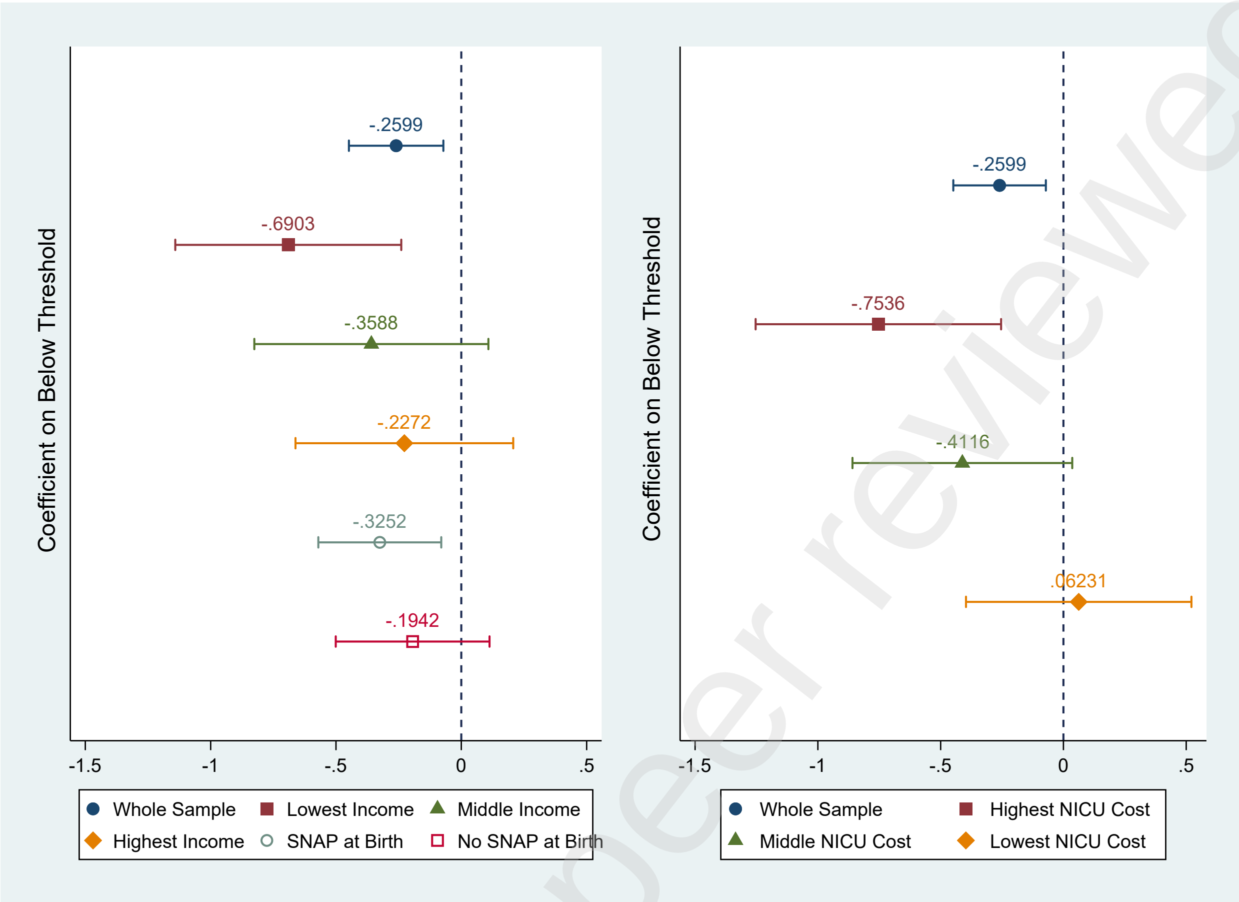


Figure 3. The impacts of birthweight eligibility for SSI on logged Medicaid spending by age 8.
Coefficient estimates are taken from separate regressions of logged cumulative Medicaid spending between birth and age 8 on the birthweight cutoff.

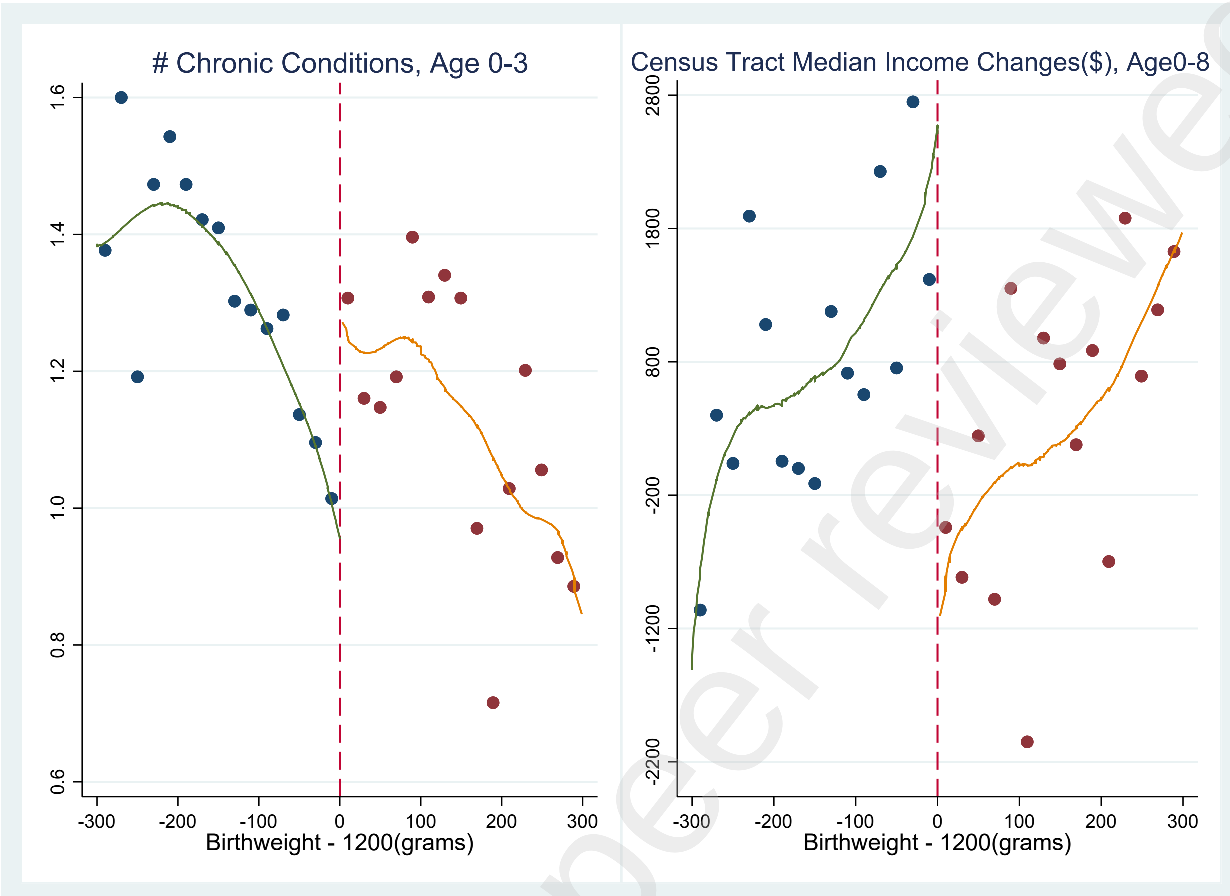


Figure 4. Effects of birthweight eligibility for SSI: Mechanisms.

N=1,348.

Figures plot local linear regression fitted lines, estimated separately on each side of the threshold, along with mean values of outcomes for each 20-gram bin. A 300-gram bandwidth and triangular kernel function are used. The running variable is birthweight centered at 1,200 grams.

Table 1. Summary statistics.

	Whole sample	Birthweight ∈ (900, 1200)	Birthweight ∈ (1,200, 1500)	p-value of difference
Birthweight (grams)	1204.364 (173.017)	1046.566 (85.934)	1347.430 (85.527)	<0.001
Ever being on SSI by age 1	0.367	0.587	0.168	<0.001
# months on SSI by age 1	3.086 (4.677)	5.147 (5.211)	1.218 (3.125)	<0.001
Ever being on SSI by age 8	0.543	0.741	0.364	<0.001
# months on SSI by age 8	37.461 (39.628)	53.510 (38.894)	22.909 (34.336)	<0.001
Female	0.467	0.435	0.496	0.025
Non-Hispanic White	0.335	0.339	0.332	0.817
Non-Hispanic Black	0.220	0.234	0.207	0.224
Hispanic	0.309	0.289	0.328	0.117
Non-Hispanic other race/ethnicity	0.071	0.081	0.062	0.178
Always lived in New York City by age 8	0.507	0.476	0.536	0.027
Always lived in rest of the state by age 8	0.465	0.493	0.440	0.051
Ever moved out of New York City by age 8	0.027	0.030	0.024	0.525
Ever moved into New York City by age 8	0.013	0.016	0.011	0.494
Observations	*1348*	*641*	*707*	

Study sample includes all infants (continuously enrolled in Medicaid for 8 years since birth) born at 32 weeks of gestation or earlier in New York State in 2006-2010 whose birthweights ∈ (900gram, 1,500gram). Standard deviation is in parentheses.

Table 2. Impacts of birthweight eligibility for SSI on healthcare utilization.

	Age ∈ [0, 3)	Age ∈ [3, 6)	Age ∈ [6, 8)	Age ∈ [0, 8)
SSI, ever	0.153*** (0.052) [0.284]	0.097* (0.053) [0.320]	0.069 (0.054) [0.317]	0.136*** (0.051) [0.364]
SSI, # months	6.076*** (1.572) [5.959]	2.395 (1.807) [10.052]	1.961 (1.227) [6.899]	10.431** (4.148) [22.909]
Logged Medicaid costs (2009$)	-0.238** (0.101) [$120323]	-0.284* (0.152) [$20952]	-0.304* (0.178) [$11366]	-0.260*** (0.098) [$152642]
Hospitalization, ever[&]	-0.106** (0.052) [0.720]	-0.026 (0.043) [0.154]	-0.031 (0.032) [0.095]	-0.082* (0.049) [0.762]
# hospitalization[&]	-0.272 (0.229) [1.769]	-0.090 (0.099) [0.252]	-0.043 (0.056) [0.126]	-0.405 (0.329) [2.147]
Length of stay, sum (days)[&]	-12.519** (6.274) [38.349]	-1.046* (0.567) [0.950]	-1.465* (0.282) [0.717]	-15.030** (6.850) [40.017]
# specialist visits	-4.837*** (1.417) [8.025]	-2.166** (1.043) [5.359]	-2.067 (1.275) [4.228]	-9.070*** (2.816) [17.612]
Early intervention/Special education[#]	-0.052 (0.048) [0.659]	-0.099* (0.053) [0.344]	-0.054 (0.048) [0.242]	-0.061 (0.046) [0.702]

N= 1,348.

[&] Excluding initial hospital stays at birth.

[#] Indicator for enrolling in the early intervention or individualized education program, which includes physical therapy, speech therapy, vision services, nutrition services, psychological services, for infants/children with disabilities or developmental delay. Services are provided free of charge without doctor's referral required in New York State.

We report the ITT effects of SSI (β_1 in equation 1). Robust standard errors are in parentheses. Control group means are in brackets. The 1,200-gram cutoff is used to estimate intent-to-treat effects of SSI. Each cell represents separate regression results. Regressions also include birthweight spline, an interaction between birthweight spline and the 1,200 cutoff, birth month and year fixed effects, race/ethnicity indicators (White, black, Hispanic, others), female indicator, and full interactions between birth cohort fixed effects, gender, race/ethnicity.

*, **, ***: significant at <0.1, <0.05, <0.001.

Table 3. The effects of birthweight eligibility for SSI on diagnosis of new chronic conditions.

	Earliest diagnosis of chronic condition (age at months)	# new chronic conditions		
		Age ∈ [0, 3)	Age ∈ [3, 6)	Age ∈ [6, 8)
Below the cutoff	1.722 (1.875)	-0.208** (0.102)	0.039 (0.050)	-0.015 (0.031)
Control group mean	14.860	1.390	0.242	0.107

N=1,348.
We report the ITT effects of SSI (β_1 in equation 1). Robust standard errors are in parentheses. Each cell represents separate regression results. Regressions include the same covariates as in Table 2. Chronic conditions include malnutrition, anemia, obesity, vision defect, hearing defect, asthma, genitourinary tract diseases, and developmental delay.
*, **, ***: significant at <0.1, <0.05, <0.001.

Table 4. The effects of birthweight eligibility for SSI on cumulative mobility by age 8.

	Coefficient on birthweight ∈ (900, 1200)	Control group mean
Moved, ever[#]	0.017 (0.055)	0.591
# Moves[#]	0.308 (0.328)	1.907
Logged distance moved (miles)[^]	-0.004 (0.090)	4.995 miles
Changes in census tract-level education attainment: High school completion (%)[&]	2.441* (1.395)	7.024
Changes in census tract-level education attainment: Bachelor degree (%)[&]	1.831 (2.193)	6.117
Changes in census tract-level poverty rate (%)[&]	-0.756 (0.469)	-1.369
Changes in census tract-level median household income (2009$)[&]	2372.658** (1025.734)	$817
Changes in census tract-level median household income (2009$), among movers[&]	2284.229* (1180.468)	$1080
Changes in census tract-level median household income (2009$), among non-movers[&]	2342.115* (1265.151)	$409

N=1,348.
[#] Enrollees whose zip codes changed during the study period.
[^] Value of 1 was assigned to those whose zip codes never changed.
[&] Comparisons between the 2009 American Community Survey (for places of birth in 2006-2010) and the 2017 American Community Survey (for places at age of 8) 5-year estimates at the census tract level.
We report the ITT effects of SSI (β_1 in equation 1). Robust standard errors are in parentheses. Each cell represents separate regression results. Regressions include the same covariates as in Table 2.
*, **, ***: significant at <0.1, <0.05, <0.001.

Table 5. Distributional effects of birthweight eligibility for SSI from birth through age 8: Quantile regression.

	Percentile				
	10th	25th	50th	75th	90th
Panel A. Logged Medicaid costs (2009$)					
Below the cutoff	-0.153 (0.123)	-0.113 (0.093)	-0.243*** (0.052)	-0.308*** (0.064)	-0.430*** (0.045)
Panel B. # hospitalization					
Below the cutoff	1.030×10^{-16} (2.358)	6.310×10^{-16} (2.351)	-0.468*** (0.178)	-0.649** (0.264)	-1.135*** (0.408)
Panel C. # specialist visits					
Below the cutoff	-1.037** (0.469)	-2.469*** (0.578)	-3.818*** (1.357)	-10.334*** (2.450)	-9.116* (4.831)
Panel D. Changes in census tract-level median household income (2009$)					
Below the cutoff	1926.330*** (631.086)	2269.708** (1135.028)	2619.998* (1469.073)	2896.633** (1456.296)	3176.681* (1868.756)

N=1,348.
Robust standard errors are in parentheses. Each cell represents separate regression results. Regressions include the same covariates as in Table 2.
*, **, ***: significant at <0.1, <0.05, <0.001.

Table 6. Counterfactual analysis.

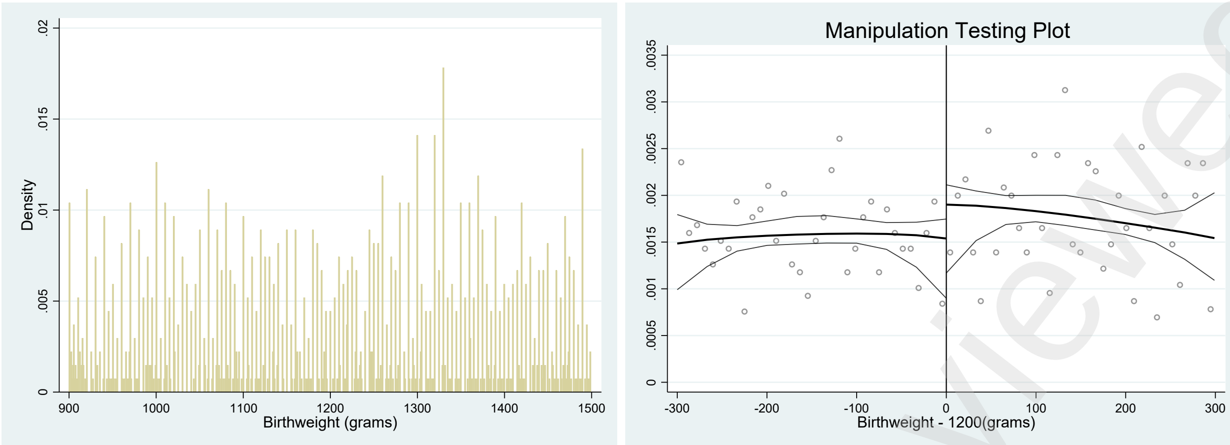
	Ever on SSI, through age 8	# months on SSI, through age 8	Logged Medicaid costs (2009$)^	Spending for initial stays (2009$)
Panel A. 1,500-gram cutoff (birthweight ∈ [1200, 1800]): Infants continuously on Medicaid for 8 years (N=2,573)				
Below the cutoff	-0.029 (0.037)	-2.451 (2.565)	-0.093 (0.097)	6845.270** (2864.993)
Control group mean	0.292	18.291	$65286	$36719
Panel B. 1,200-gram cutoff (birthweight ∈ [900, 1500]): Main study population (preterm infants continuously on Medicaid for 8 years; N=1,348)				
Below the cutoff	0.136*** (0.051)	10.431** (4.148)	-0.260*** (0.098)	1093.699 (7052.142)
Control group mean	0.364	22.909	$152642	$83585

^ Excluding costs for initial hospital stays at birth.
We report the reduced-form effects of the birthweight cutoffs. Robust standard errors are in parentheses. Each cell represents separate regression results. Regressions include the same covariates as in Table 2.
*, **, ***: significant at <0.1, <0.05, <0.001.

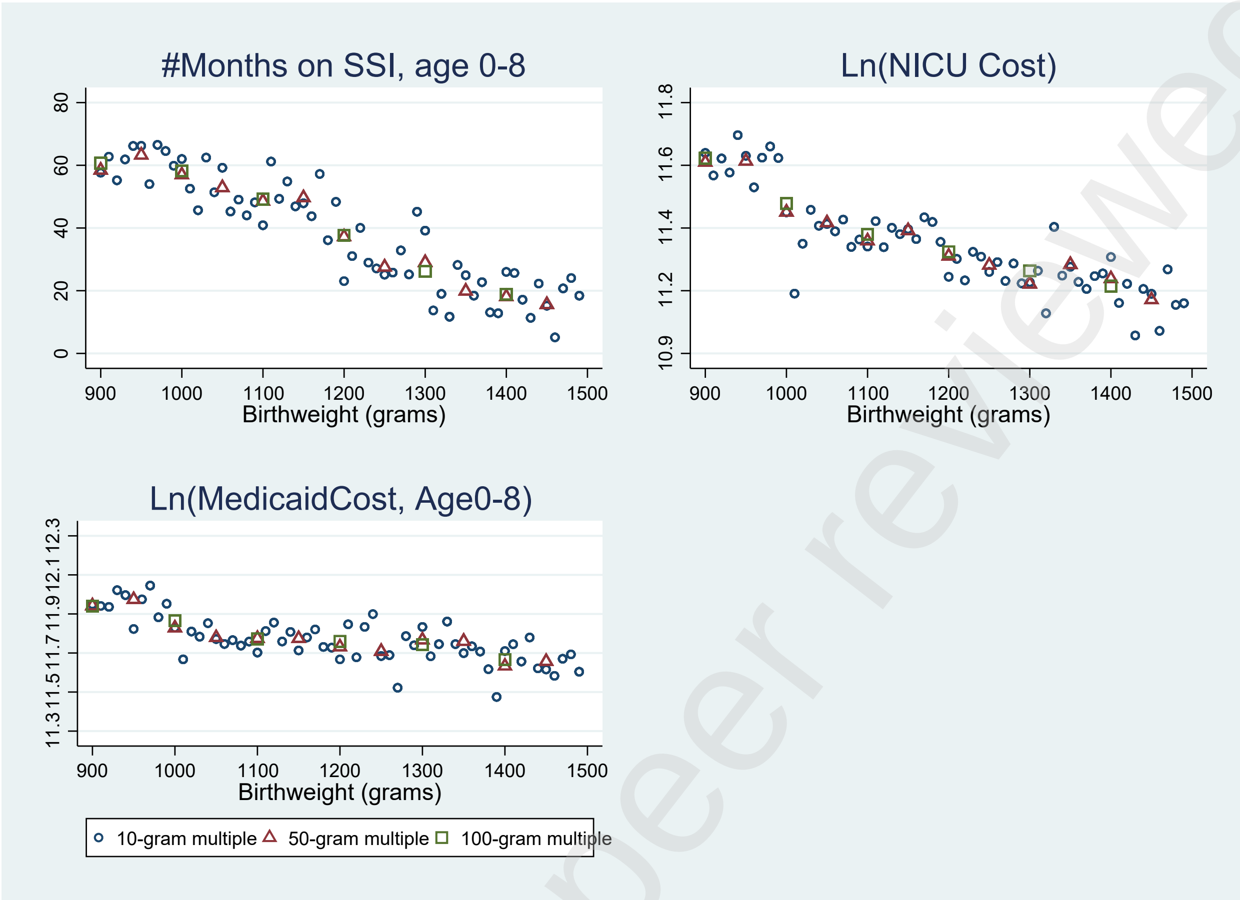
Table 7. Robustness check: Alternative specifications on the effects of birthweight eligibility for SSI on cumulative outcomes from birth through age 8.

	Main specification	Bandwidth: 250 grams	Bandwidth: 200 grams	Sample without preterm restriction	Excluding birthweight ∈ [1195, 1205]	Non-parametric local linear regression[#]	Excluding utilization during the first 6 months	With delivery hospital FE
SSI, ever	0.136*** (0.051)	0.126** (0.057)	0.147** (0.065)	0.165*** (0.044)	0.128** (0.053)	0.197** (0.091)	0.136*** (0.051)	0.134*** (0.052)
SSI, # months	10.431** (4.148)	8.493* (4.587)	10.095** (5.112)	12.630*** (0.012)	10.196** (4.310)	11.387* (6.860)	10.431** (4.148)	8.752** (4.169)
Logged Medicaid costs (2009$)	-0.260*** (0.098)	-0.229** (0.110)	-0.210* (0.121)	-0.262*** (0.087)	-0.220** (0.101)	-0.218 (0.168)	-0.313** (0.123)	-0.285*** (0.098)
# New chronic conditions, age 0-3	-0.208** (0.102)	-0.199* (0.111)	-0.214* (0.127)	-0.131* (0.077)	-0.234** (0.104)	-0.101 (0.072)	-0.132* (0.075)	-0.241** (0.104)
Changes in census tract median household income (2009$)	2372.658** (1025.734)	2756.553** (1388.406)	2665.348* (1608.391)	3372.658** (1700.782)	2302.462** (1028.386)	6357.300 (5098.9)	2372.658** (1025.734)	3725.896** (1206.935)
Observations	*1348*	*1122*	*913*	*1871*	*1326*	*1348*	*1348*	*1348*

[#] A 300-gram bandwidth, quadratic function of birthweight, and triangular kernel function are used.
Robust standard errors are in parentheses. Each cell represents separate regression results. Regressions include the same covariates as in Table 2.
*, **, ***: significant at <0.1, <0.05, <0.001.



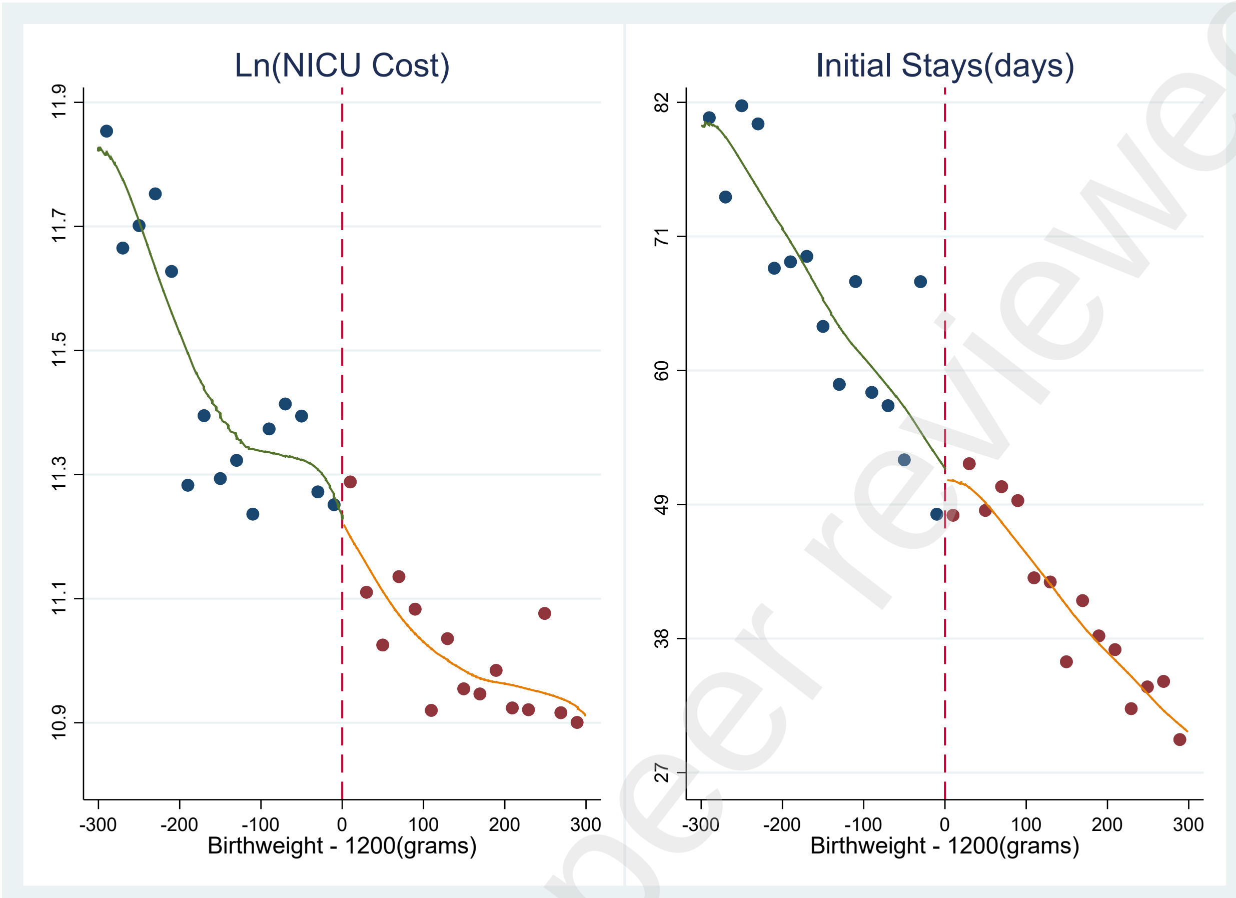
Appendix Figure 1. Birthweight distribution (left) & manipulation testing plot (right).
N=1,348.
The left panel presents birthweight histogram with 1-gram bins around the 1,200-gram threshold in our study population. The right panel shows a manipulation testing plot using the local polynomial density estimators and robust confidence bands (Cattaneo et al., 2015).



Appendix Figure 2. Unadjusted means of main outcomes.

N=1,348.

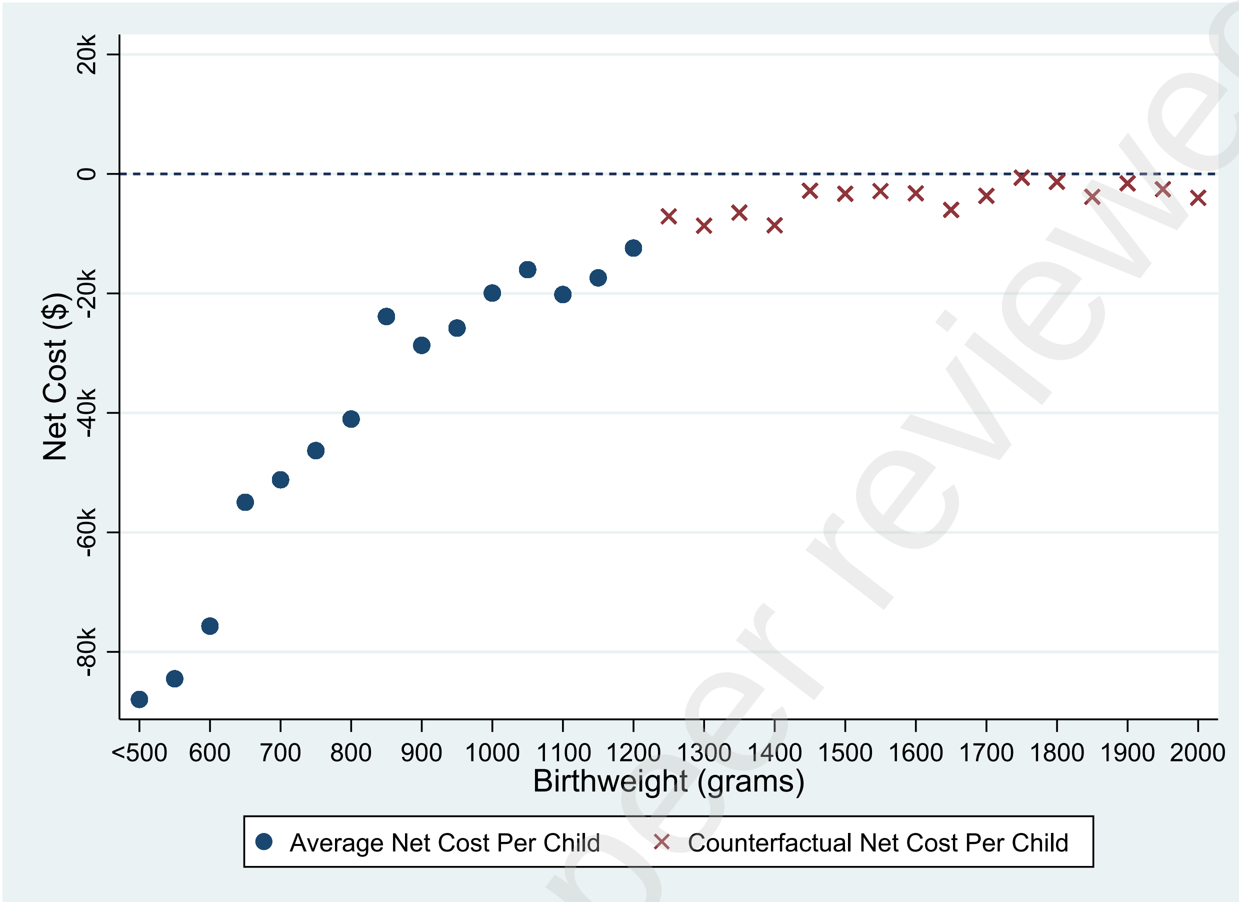
Figures show unadjusted means of outcomes at each 10-, 50-, and 100-gram multiples. Note, unlike the abrupt change at the very low birthweight threshold shown in Barreca et al. (2011), those at the 1,200-gram heap do not incur Medicaid spending substantially higher or lower than do nearby observations.



Appendix Figure 3. The low-birthweight threshold for SSI and medical inputs at birth.

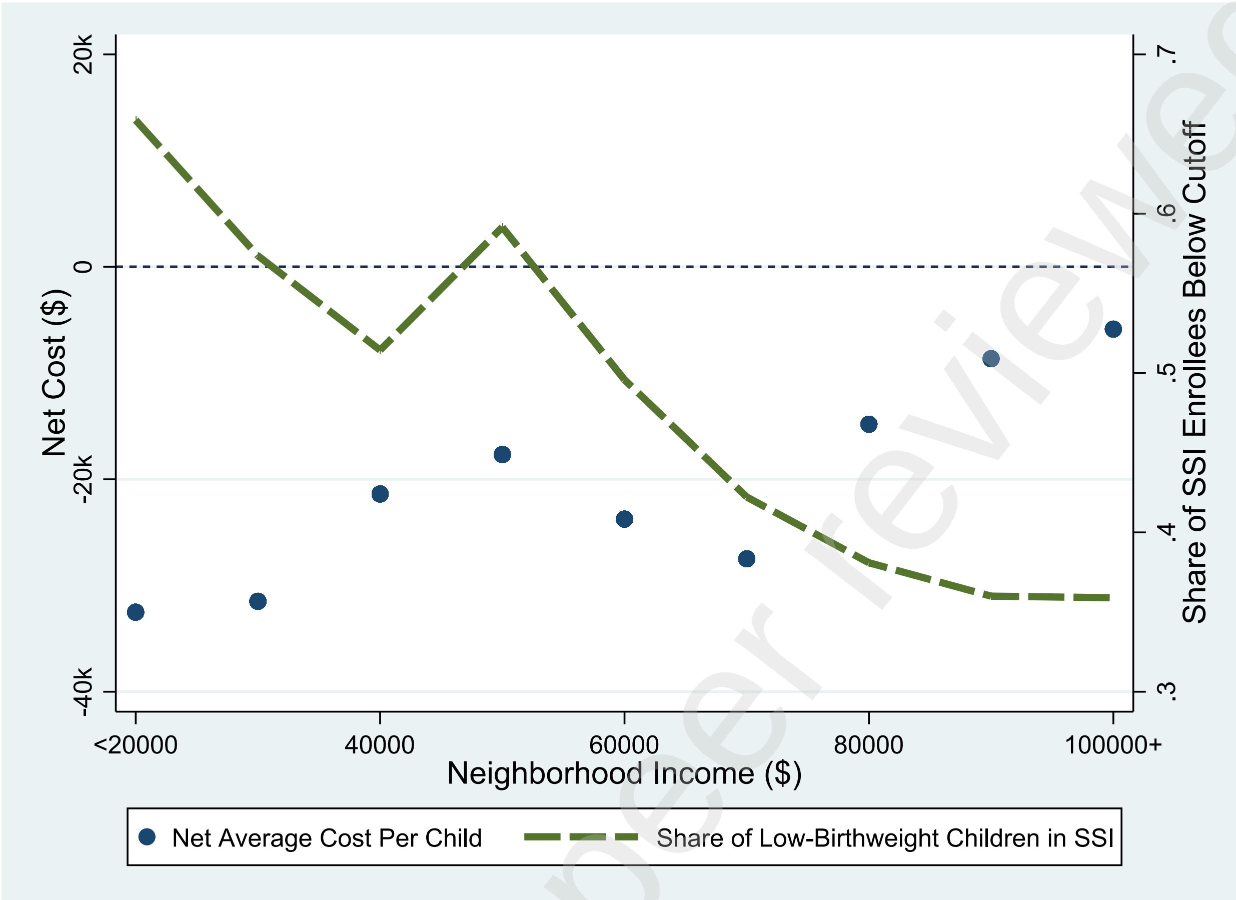
N=1,348.

Figures plot local linear regression fitted lines, estimated separately on each side of the threshold, along with mean values of outcomes for each 20-gram bin. A 300-gram bandwidth and triangular kernel function are used. The running variable is birthweight centered at 1,200 grams.



Appendix Figure 4. Net cost of SSI to the government by birthweight.

Net cost equals average SSI benefits provided to eligible children (average SSI spells (10.4 months) multiplied by average SSI benefits ($600)) minus estimated saved Medicaid costs (incurred after initial stay) by age 8. To calculate reduced Medicaid spending, we use the constant regression discontinuity treatment effect (-0.26 log points) both below and above the 1,200-gram cutoff based on the finding that treatment effect derivative is close to zero.



Appendix Figure 5. Net cost of SSI to the government by income level.

Net cost equals average SSI benefits provided to eligible children (average SSI spells (10.4 months) multiplied by average SSI benefits ($600)) minus estimated saved Medicaid costs (incurred after initial stay) by age 8. We use coefficients weighted by the share of vulnerable children in each income bracket and differential coefficient estimates (see text for details). Income level represents the 2009 census tract median household income.

Appendix Table 1. SSI take-up by age 1 classified by demographics.

	Birthweight ∈ (900, 1200)	Birthweight ∈ (1,200, 1500)
Panel A. Ever being on SSI by age 1		
Girls (N=630)	0.545	0.114
Boys (N=718)	0.619	0.222
Non-Hispanic White (N=452)	0.714	0.196
Non-Hispanic Black (N=296)	0.600	0.205
Hispanic (N=417)	0.492	0.142
Non-Hispanic other (N=96)	0.538	0.091
New York City (N=684)	0.521	0.164
Rest of the state (N=627)	0.655	0.177
Panel B. # months on SSI by age 1		
Girls (N=630)	4.742 (5.190)	0.755 (2.504)
Boys (N=718)	5.459 (5.212)	1.674 (3.580)
Non-Hispanic White (N=452)	6.535 (5.293)	1.481 (3.526)
Non-Hispanic Black (N=296)	5.407 (5.316)	1.623 (3.531)
Hispanic (N=417)	4.135 (0.360)	0.897 (2.550)
Non-Hispanic other (N=96)	4.269 (4.487)	0.818 (2.730)
New York City (N=684)	4.482 (5.053)	1.135 (3.005)
Rest of the state (N=627)	5.832 (5.283)	1.318 (3.247)

Study sample includes all infants (continuously enrolled in Medicaid for 8 years since birth) born at 32 weeks of gestation or earlier in New York State in 2006-2010 whose birthweights ∈ (900gram, 1,500gram). Each cell shows average SSI take-up (extensive margin in Panel A & intensive martin in Panel B) for subgroups. Standard deviations are in parentheses. All differences were statistically significant at 1%.

Appendix Table 2. SSI receipt trajectory by age 8.

Earliest enrollment in SSI	Observations	Continuously enrolled in SSI by age 2	Continuously enrolled in SSI by age 3	Continuously enrolled in SSI by age 4	Continuously enrolled in SSI by age 5	Continuously enrolled in SSI by age 6	Continuously enrolled in SSI by age 7	Continuously enrolled in SSI by age 8
Panel A. Birthweight ∈ (900, 1200)								
Never	166 (25.9%)	-	-	-	-	-	-	-
Age ∈ [0, 1)	376 (58.7%)	0.774	0.660	0.566	0.487	0.426	0.351	0.295
Age ∈ [1, 2)	65 (10.1%)	-	0.862	0.785	0.708	0.600	0.554	0.477
Age ∈ [2, 3)	11 (1.7%)	-	-	0.909	0.818	0.727	0.636	0.636
Age ∈ [3, 4)	7 (1.1%)	-	-	-	0.857	0.714	0.714	0.571
Age ∈ [4, 5)	5 (0.8%)	-	-	-	-	0.800	0.600	0.600
Age ∈ [5, 6)	6 (0.9%)	-	-	-	-	-	0.833	0.833
Age ∈ [6, 7)	5 (0.8%)	-	-	-	-	-	-	0.400
Age ∈ [7, 8)	0	-	-	-	-	-	-	-
Panel B. Birthweight ∈ (1200, 1500)								
Never	450 (63.7%)	-	-	-	-	-	-	-
Age ∈ [0, 1)	119 (16.8%)	0.773	0.723	0.664	0.563	0.496	0.420	0.353
Age ∈ [1, 2)	41 (5.8%)	-	0.902	0.854	0.829	0.756	0.732	0.659
Age ∈ [2, 3)	41 (5.8%)	-	-	0.951	0.927	0.902	0.829	0.756
Age ∈ [3, 4)	24 (3.4%)	-	-	-	0.917	0.917	0.875	0.708
Age ∈ [4, 5)	12 (1.7%)	-	-	-	-	0.833	0.750	0.750
Age ∈ [5, 6)	6 (0.8%)	-	-	-	-	-	1	1
Age ∈ [6, 7)	6 (0.8%)	-	-	-	-	-	-	0.667
Age ∈ [7, 8)	8 (1.1%)	-	-	-	-	-	-	-

N= 641 (below the cutoff) & 707 (above the cutoff).
Study sample includes all infants (continuously enrolled in Medicaid for 8 years since birth) born in New York State in 2006-2010, born at 32 weeks or earlier, whose birthweights fall between 900 grams and 1,500grams.

Appendix Table 3. First stage results by age.

		Outcome: # months on SSI			Outcome: Ever on SSI		
		Main study population	No preterm restriction	Control group mean^	Main study population	No preterm restriction	Control group mean^
Coefficient on below the cutoff	Age ∈ [0, 1)	1.788*** (0.466)	2.262*** (0.396)	1.218	0.156*** (0.047)	0.204*** (0.040)	0.168
	Age ∈ [1, 2)	2.292*** (0.542)	2.879*** (0.464)	2.026	0.197*** (0.048)	0.239*** (0.041)	0.205
	Age ∈ [2, 3)	1.995*** (0.576)	2.174*** (0.492)	2.716	0.163*** (0.050)	0.200*** (0.043)	0.253
	Age ∈ [3, 4)	0.941 (0.595)	1.344*** (0.512)	3.204	0.077 (0.051)	0.119*** (0.044)	0.289
	Age ∈ [4, 5)	0.580 (0.605)	0.934* (0.522)	3.407	0.067 (0.052)	0.093** (0.044)	0.303
	Age ∈ [5, 6)	0.874 (0.610)	1.056** (0.524)	3.441	0.073 (0.052)	0.087* (0.045)	0.301
	Age ∈ [6, 7)	0.971 (0.611)	1.064** (0.527)	3.499	0.080 (0.052)	0.087* (0.045)	0.306
	Age ∈ [7, 8)	0.990 (0.612)	0.918* (0.524)	3.399	0.062 (0.052)	0.070 (0.045)	0.303

N=1,348 (main study sample with preterm restriction (born at 32 gestational weeks or earlier)) & 1,871 (sample without the preterm restriction).

^ Average among the main study population (N=1,348).

We specify linear regressions of the SSI enrollment measures on the low-birthweight cutoff for SSI eligibility. Robust standard errors are in parentheses. Each row represents separate regression results. Regressions include the same covariates as in Table 2.

*, **, ***: significant at <0.1, <0.05, <0.001.

Appendix Table 4. Treatment on the treated effects of birthweight eligibility for SSI spells on cumulative Medicaid costs: Fuzzy regression discontinuity design.

	Main study population (N=1,348)		No preterm restriction (N=1,871)	
First stage age interval	First stage coefficient on SSI spells	Second stage coefficient on cumulative Medicaid costs through age 8	First stage coefficient on SSI spells	Second stage coefficient on cumulative Medicaid costs
Age ∈ [0, 1)	1.760*** (0.515)	-0.118* (0.070)	2.229*** (0.430)	-0.112** (0.045)
Age ∈ [0, 2)	4.046*** (1.046)	-0.057* (0.030)	5.117*** (0.874)	-0.049** (0.019)
Age ∈ [0, 3)	6.036*** (1.604)	-0.038* (0.020)	7.301*** (1.330)	-0.034** (0.014)
Age ∈ [0, 4)	6.983*** (2.143)	-0.034* (0.019)	8.676*** (1.782)	-0.029** (0.012)
Age ∈ [0, 5)	7.590*** (2.670)	-0.032* (0.018)	9.670*** (2.234)	-0.026** (0.012)
Age ∈ [0, 6)	8.490*** (3.199)	-0.029* (0.017)	10.777*** (2.689)	-0.023** (0.011)
Age ∈ [0, 7)	9.480** (3.730)	-0.027* (0.016)	11.889*** (3.114)	-0.021** (0.010)
Age ∈ [0, 8)	10.487** (4.244)	-0.024 (0.015)	12.857*** (3.585)	-0.019** (0.010)

We specify two-stage least squares regressions. The instrument is an indicator that a child was born below the 1,200-gram cutoff for SSI eligibility. The second stage shows the estimated effects of an additional month on SSI on cumulative Medicaid costs through age 8. Robust standard errors are in parentheses. Each cell represents separate regression results. First stage F statistics are all above 10. Regressions include the same covariates as in Table 2.
*, **, ***: significant at <0.1, <0.05, <0.001.

Appendix Table 5. Health condition impacts of birthweight eligibility for SSI.

	Age ∈ [0, 3)	Age ∈ [3, 6)	Age ∈ [6, 8)	Age ∈ [0, 8)
SSI, ever	0.153*** (0.052) [0.284]	0.097* (0.053) [0.320]	0.069 (0.054) [0.317]	0.136*** (0.051) [0.364]
SSI, # months	6.076*** (1.572) [5.959]	2.395 (1.807) [10.052]	1.961 (1.227) [6.899]	10.431** (4.148) [22.909]
Fever of unknown origin	-0.030 (0.056) [0.438]	-0.099** (0.050) [0.270]	0.028* (0.016) [0.025]	-0.046 (0.056) [0.553]
Malnutrition	-0.033** (0.013) [0.021]	-0.008 (0.008) [0.008]	0.013* (0.007) [0.004]	-0.015 (0.015) [0.027]
Anemia	-0.016 (0.044) [0.177]	-0.012 (0.027) [0.081]	-0.002 (0.009) [0.014]	-0.011 (0.046) [0.218]
Obesity	-0.013 (0.020) [0.025]	0.025 (0.029) [0.074]	-0.039 (0.030) [0.095]	-0.023 (0.037) [0.136]
Vision defect	0.030 (0.038) [0.146]	-0.011 (0.050) [0.240]	-0.008 (0.022) [0.042]	-0.015 (0.052) [0.330]
Hearing impairment	-0.014 (0.047) [0.204]	-0.006 (0.036) [0.112]	0.008 (0.012) [0.014]	0.011 (0.051) [0.256]
Upper respiratory tract infection	-0.058 (0.042) [0.829]	-0.077 (0.048) [0.744]	0.015 (0.028) [0.115]	-0.058** (0.028) [0.926]
Lower respiratory tract infection	-0.038 (0.056) [0.545]	0.033 (0.048) [0.225]	-0.009 (0.014) [0.024]	-0.041 (0.053) [0.634]
Asthma	-0.042 (0.055) [0.396]	-0.003 (0.054) [0.341]	0.042 (0.032) [0.105]	-0.037 (0.055) [0.506]
Diseases of the digestive system	-0.081* (0.046) [0.751]	0.042 (0.056) [0.537]	-0.002 (0.054) [0.365]	0.009 (0.032) [0.891]
Diseases of the genitourinary system	-0.083** (0.038) [0.117]	0.012 (0.036) [0.098]	0.007 (0.021) [0.037]	-0.065 (0.047) [0.218]
Urinary tract infection	-0.064** (0.030) [0.079]	-0.004 (0.024) [0.047]	0.009 (0.013) [0.014]	-0.054 (0.036) [0.126]
Allergic reactions	0.052 (0.055) [0.380]	-0.022 (0.048) [0.209]	-0.035 (0.023) [0.047]	0.033 (0.056) [0.485]
Injury	-0.008 (0.056) [0.475]	0.064 (0.056) [0.388]	-0.020 (0.032) [0.113]	0.024 (0.052) [0.655]
Burn	-0.047** (0.020) [0.024]	-0.015 (0.011) [0.013]	0.006 (0.006) [0]	-0.056** (0.022) [0.035]
Anxiety	(no cases)	0.004 (0.012) [0.013]	0.001 (0.010) [0.006]	0.009 (0.015) [0.018]
Developmental delay	-0.034 (0.048) [0.679]	-0.111** (0.053) [0.358]	-0.014 (0.037) [0.141]	-0.040 (0.046) [0.726]
Early intervention/Special education	-0.052 (0.048) [0.659]	-0.099* (0.053) [0.344]	-0.054 (0.048) [0.242]	-0.061 (0.046) [0.702]
Health outcome index^	-0.192* (0.103)	-0.175* (0.103)	-0.012 (0.098)	-0.157* (0.081)
Logged Medicaid costs (2009$)	-0.238** (0.101) [$120323]	-0.284* (0.152) [$20952]	-0.304* (0.178) [$11366]	-0.260*** (0.098) [$152642]

N= 1,348.

^ Created by principal components analysis and grouping all the 18 conditions in the table. Each index has a mean of zero and standard deviation of one.

We report the ITT effects of SSI (β_1 in equation 1) on having any visits with primary conditions related to those conditions in the above table. Robust standard errors are in parentheses. Control group means are in brackets. Each cell represents separate regression results. Regressions include the same covariates as in Table 2.

*, **, ***: significant at <0.1, <0.05, <0.001.

Appendix Table 6. The effects of birthweight eligibility for SSI by SNAP enrollment at birth.

	Sample with preterm restriction			Sample without preterm restriction		
	Main specification	SNAP households at birth	Non-SNAP households at birth	Main specification	SNAP households at birth	Non-SNAP households at birth
SSI, ever	0.136***	0.166**	0.075	0.165***	0.220***	0.118*
	(0.051)	(0.070)	(0.082)	(0.044)	(0.060)	(0.070)
SSI, # months	10.431**	12.376**	6.470	12.630***	15.676***	9.723*
	(4.148)	(5.612)	(6.455)	(0.012)	(4.877)	(5.436)
Logged Medicaid costs (2009$)	-0.260***	-0.325**	-0.194	-0.262***	-0.303***	-0.199
	(0.098)	(0.129)	(0.164)	(0.087)	(0.115)	(0.141)
Observations	*1348*	*738*	*610*	*1871*	*1016*	*855*

We report the ITT effects of SSI (β_1 in equation 1) on cumulative SSI enrollment and Medicaid costs from birth through age 8 among subgroups classified by SNAP enrollment at birth and preterm (born at 32 weeks or earlier). Robust standard errors are in parentheses. Each cell represents separate regression results. Regressions include the same covariates as in Table 2.
*, **, ***: significant at <0.1, <0.05, <0.001.

Appendix Table 7. Impacts of SSI on healthcare utilization by initial conditions by age 8.

	Congenital anomalies		Medicaid costs of initial hospital stay	
	No	Yes	Below median	Above median
Logged Medicaid costs (2009$)^	-0.307* (0.170)	-0.425** (0.211)	-0.300 (0.211)	-0.571*** (0.216)
Hospitalization, ever	-0.036 (0.071)	-0.170** (0.066)	0.055 (0.088)	-0.214** (0.084)
# hospitalization	-0.246 (0.412)	-0.595 (0.631)	-0.012 (0.540)	-0.988* (0.568)
Length of stay, sum (days)#	-5.119 (6.683)	-18.760* (9.602)	-9.496 (10.675)	-20.867** (9.725)
# specialist visits	-8.699*** (2.825)	-9.867* (5.717)	-13.029*** (3.808)	-5.345 (4.093)
Observations	*761*	*587*	*674*	*674*

^ Costs incurred during initial hospital stays are excluded.
We report the ITT effects of SSI (β_1 in equation 1) among subgroups classified by congenital anomalies and initial medical spending (indicated in the first two rows). Robust standard errors are in parentheses. Each cell represents separate regression results. Regressions include the same covariates as in Table 2.
*, **, ***: significant at <0.1, <0.05, <0.001.

Appendix Table 8. Impacts of birthweight eligibility for SSI on childhood immunization by age 8.

	Binary outcome		Continuous outcome	
	All recommended vaccinations were administered	All vaccinations were administered "on-time"	# vaccines given	# vaccines given "on-time"
Below the cutoff	0.020 (0.024)	-0.002 (0.018)	-0.620 (0.659)	-0.332 (0.600)
Control group mean	0.064	0.045	12.124	10.133

N=1,348.
We report the ITT effects of SSI (β_1 in equation 1) on childhood vaccination outcomes. Robust standard errors are in parentheses. Each cell represents separate regression results. Regressions include the same covariates as in Table 2. Essential vaccinations include 3 shots for Hepatitis B, 4 for DTaP, 4 for Haemophilus Influenza, 4 for polio, 2 for MMR, and 2 for varicella since birth (total of 20 shots). We use age-in-days criteria for determining on-time vaccination for each vaccine administration following Sohn et al. (2011).
*, **, ***: significant at <0.1, <0.05, <0.001.

Appendix Table 9. The effects of birthweight eligibility for SSI on cumulative maternal health outcomes and fertility until 8 years since birth.

	Child's birthweight is below the cutoff	Control group mean
Anxiety	-0.035 (0.044)	0.294
Mood disorder	0.009 (0.032)	0.089
Substance-related disorder	0.012 (0.025)	0.061
Alcohol-related disorder	-0.007 (0.016)	0.033
Pregnancy	-0.045 (0.042)	0.808
Contraceptive utilization	-0.046 (0.046)	0.753
Logged Medicaid cost (2009$)	-0.080 (0.088)	$39097
Hospitalization, ever	-0.012 (0.040)	0.827
# hospitalization	-0.102 (0.131)	1.781
# specialist visits	0.316 (1.911)	11.153

N=1,268.
We report ITT effects of child's low-birthweight eligibility for SSI on maternal outcomes. Robust standard errors are in parentheses. We link the 2006-2010 cohort to their biological mothers by using administrative case numbers and birth dates. Each cell represents separate regression results. Regressions include mother's age at birth as well as the same covariates as in Table 2.
*, **, ***: significant at <0.1, <0.05, <0.001.

Appendix Table 10. Association of the birthweight eligibility for SSI with SSI enrollment.

	By 3 months of age		By 6 months of age		By 9 months of age		By 12 months of age	
Panel A. Outcome: Indicator for SSI enrollment								
Below the cutoff	0.137*** (0.045)	0.152*** (0.044)	0.153*** (0.049)	0.154*** (0.048)	0.151*** (0.050)	0.154*** (0.049)	0.156*** (0.051)	0.157*** (0.049)
Panel B. Outcome: Months on SSI								
Below the cutoff	0.464*** (0.131)	0.512*** (0.140)	0.880*** (0.238)	0.960*** (0.251)	1.311*** (0.351)	1.399*** (0.369)	1.788*** (0.466)	1.880*** (0.490)
Delivery hospital FE		√		√		√		√
Control group mean	0.068		0.113		0.143		0.168	

N=1,348.
We report the ITT effects (β_1 in equation 1) on SSI enrollment measures over the first 3, 6, 9, and 12 months of children's lives with and without the delivery hospital fixed effects included to explore if certain hospitals do better at getting birthweight-eligible babies enrolled in SSI. Robust standard errors are in parentheses. Each cell represents separate regression results. Regressions include the same covariates as in Table 2.
*, **, ***: significant at <0.1, <0.05, <0.001.

Appendix Table 11. Test of sample selection bias.

	Outcome: Probability of continuous enrollment in Medicaid		
	By age 3	By age 6	By age 8
Below the cutoff	-0.005 (0.031)	0.025 (0.031)	0.027 (0.031)
Enrolled in SNAP at Birth	0.181*** (0.023)	0.225*** (0.024)	0.231*** (0.023)
Below the cutoff * Enrolled in SNAP at Birth	-0.001 (0.034)	-0.007 (0.034)	-0.028 (0.034)

N=3,690.

We report ITT effects of SSI (β_1 in equation 1) using the sample that includes all infants whose birthweights $\in$ (900gram, 1,500gram), born in New York State in 2006-2010, and born at 32 weeks of gestation or earlier. Outcome measures are the indicators that a child has been continuously on Medicaid for 3, 6, and 8 years. Robust standard errors are in parentheses. Each cell represents separate regression results. Regressions include the same covariates as in Table 2.

*, **, ***: significant at <0.1, <0.05, <0.001.

Appendix Table 12. Test of sample selection bias: Regression on cumulative outcomes by age 3 varying by study sample.

Outcome measures	Sample: Continuously enrolled in Medicaid		
	By age 3	By age 6	By age 8 (main specification)
SSI, ever	0.175*** (0.040)	0.157*** (0.047)	0.153*** (0.052)
SSI, # months	6.636*** (1.190)	6.374*** (1.408)	6.076*** (1.572)
Logged Medicaid costs (2009$)	-0.180** (0.082)	-0.209** (0.093)	-0.238** (0.101)
Observations	*2217*	*1637*	*1348*

We report ITT effects of SSI (β_1 in regression equation 1) with study samples varying by different continuous enrollment restrictions. Outcome measures are SSI enrollment and cumulative Medicaid costs from birth through age 3. Robust standard errors are in parentheses. Each cell represents separate regression results. Regressions include the same covariates as in Table 2.
*, **, ***: significant at <0.1, <0.05, <0.001.

Appendix Table 13. ITT effects of birthweight eligibility for SSI on cumulative outcomes by age 6: Using an extended sample.

	Main study population (2006-2010 cohort)	Extended sample (2006-2012 cohort)
SSI, ever	0.142*** (0.045)	0.161*** (0.040)
SSI, # months	9.677*** (2.632)	10.087*** (2.337)
Logged Medicaid costs from birth through age 6 (2009$)	-0.224** (0.088)	-0.243*** (0.082)
Observations	*1348*	*2089*

We report ITT effects of SSI (β_1 in regression equation 1). Outcome measures are SSI enrollment and cumulative Medicaid costs from birth through age 6. Robust standard errors are in parentheses. Each cell represents separate regression results. Regressions include the same covariates as in Table 2.
*, **, ***: significant at <0.1, <0.05, <0.001.