What Is Known About This Topic

Poor children in the United States are less healthy than other children, and poverty is persistent across generations.

What This Study Adds

Research demonstrates that widespread public health and nutrition interventions for the poor have substantive positive benefits for children that last well into adulthood. Policies that reduce low-income children’s contemporaneous health problems may also be wise investments in terms of reducing future public expenditures.

Implications for Practice and Policy

The body of research makes clear that large-scale public health and nutrition interventions provide far reaching benefits for poor children, though these improvements will not be apparent in an official poverty measure based entirely on household cash income. Nevertheless, because these programs improve adult health, earnings and overall self-sufficiency, they are crucial levers to reducing the intergenerational transmission of poverty, and may also reduce future public expenditures.

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

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Poor children in the United States are less healthy than other children, which may be a central factor in why poverty persists across generations. Research approaches that use geographic and over time variation in the generosity of public health and nutrition programs let researchers disentangle the effects of a program from other correlated factors. These approaches confirm that programs such as Medicaid, SNAP and WIC have broad benefits. They also suggest that access to these programs in early life improves children’s economic well-being as adults, which likely transmits to the next generation.

Poverty is strongly persistent across generations. Studies show that children whose family income is in the bottom 20 percent have a 34 percent chance of remaining in the bottom quintile when they reach adulthood. Studies have also established that poor health in childhood reduces economic success in later life. Thus, poorer health may be one of the mechanisms that contribute to the intergenerational transmission of poverty.

Federal health and nutrition programs are an important part of the safety net for low-income children. Three of these are Medicaid, SNAP and WIC. The body of research shows the widespread benefits health and nutrition programs have for children in poor households. Early life access to these programs is associated with higher birth weight, improvements in adult health, greater lifetime earnings and higher tax payments. One recent study estimated that gains resulting from the 1980s and 1990s Medicaid expansions will lead the government to recoup at least 56 cents of each $1 spent on childhood Medicaid by the time the affected children reach age 60.

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Introduction

In 2015, nearly 20% of American children under age 18 lived in families with incomes below the poverty level. The child poverty rate was 58% higher than the poverty rate among working age adults (12.4%), and more than double the elderly poverty rate (8.8%). Recent analyses indicate that one in ten American children spends at least half of their childhood in poverty (Wagmiller and Adelman, 2009).

Poor children in the United States are less healthy than other children. The relationship between family income and health appears early in life and grows throughout childhood, so that children from income disadvantaged households enter adulthood with worse health, with more serious chronic health conditions, and having missed more days of school (Case, Lubotsky and Paxson, 2002). They are more likely to experience asthma and other respiratory conditions, digestive disorders, hearing problems, heart conditions, and mental health problems (Case, Lubotsky and Paxson, 2002; Currie and Lin, 2007; Newacheck, Jameson and Halfon, 1994). These differences may arise from a number of factors including poor families’ relatively lower access to medical care, higher rates of food insecurity, and poorer nutrition.

Inferior health may in turn compromise low-income children’s chances for future economic success. Poverty is known to be strongly persistent across generations – adults in the U.S. who experienced at least one year of poverty during childhood are more than ten times as likely to be poor at age 35 as those whose families were never poor (Wagmiller and Adelman, 2009). A number of careful studies that emulate experimental research designs have also established that negative health experiences in childhood reduce educational and economic success in later life (e.g. Almond 2006; Barreca 2010; Chen and Zhou, 2007; Neelsen and Stratmann, 2012; Almond and Mazumder, 2011; Almond et al., 2009; Nilsson 2009; Sanders 2012; Isen et al., 2016). Thus, inferior health may be one of the mechanisms that contributes to the intergenerational transmission of poverty. This also suggests that policies that address low-income children’s health may be wise investments in terms of improving children’s long-term life chances and reducing future public expenditures.

Health and nutrition programs have long been an important part of the U.S. safety net serving low-income children, but as cash assistance has declined in the last twenty years, their relative importance has significantly increased. The two largest health and nutrition programs—Medicaid and the Supplemental Nutrition Assistance Program— together comprise nearly a quarter of U.S. expenditures on children (Edelstein et. al. 2016). The efficacy of these programs is regularly debated, however.

This paper will make an evidence-based case that large scale public health and nutrition interventions provide far reaching benefits for poor children, and that these programs are crucial levers towards reducing the intergenerational transmission of poverty, even if their benefits are not transparent in current official poverty statistics. Maintaining and further expanding the services provided through these programs could go a long way towards reducing poverty among subsequent generations of children. I will begin by providing an overview of major health and nutrition programs in the United States. I will then summarize findings produced by the rapidly expanding literature examining the short and long term impacts of childhood exposure to Medicaid, the Supplemental Nutrition Assistance Program, the Supplemental Nutrition Program for Women, Infants, and Children, and the National School Lunch and School Breakfast programs. These programs currently reach upwards of 45 million low income children in the United States, and at least 7 million low income children in California.

Overview of Means-tested U.S. Health and Nutrition Programs

Table 1, which draws heavily from information provided in Hoynes and Schanzenbach (2015), provides an overview of the five primary health and nutrition programs targeting low income children and families in the United States:
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<td><strong>Medicaid</strong> 82.8 billion</td>
<td>Low-income individuals; 36.8 million children</td>
<td>Provides medical benefits to low-income individuals. All states must cover a basic set of mandatory benefits (such as hospitals services and laboratory services). States may expand benefits to include additional services (such as prescription drugs and hospice care).</td>
<td>Generally defined by the relationship between Modified Adjusted Gross Income (MAGI) and the federal poverty line, with different thresholds for different groups and states. Eligibility thresholds for children range from 141% to 375% of the FPL (2016). States can also expand coverage to low income adults, disabled adults, and the medically needy.</td>
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<td><strong>Supplemental Nutrition Assistance Program (SNAP), formerly FSP 33.2 billion</strong></td>
<td>Low-income households; 20 million children</td>
<td>Monthly benefit issued electronically via Electronic Benefit Transfer (EBT) card account and calculated based on Thrifty Food Plan. Maximum monthly allotment through 2015: $194 for 1 person household, $511 for 3 person household, and $925 for 6 person household. Average benefit amount for FY 2015 was $126.83 per person and $257.73 per household.</td>
<td>Household gross monthly income of &lt;130% of poverty. Meet countable resource limit of $2,250 or $3,250 for elderly or disabled; TANF, SSI, and GA recipients eligible; legal, qualified aliens may be SNAP eligible; some households may be required to meet employment, service, and training requirements; individuals without a Social Security number, most postsecondary students, and strikers not eligible.</td>
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<td><strong>Special Supplemental Nutrition Program for Women, Infants, and Children (WIC)</strong> 5.6 billion</td>
<td>Low-income pregnant or postpartum women, infants (&lt;1), and children (&lt;5); 6.1 million children</td>
<td>Food instrument or cash-value voucher (some states on EBT) to purchase specified nutritious foods rich in protein, iron, calcium vitamins, A, C, and D; nutrition education; screening and referrals to health and other social services. Food package assignment varies by situational need.</td>
<td>Pregnant, postpartum, or breastfeeding women, infants, or children &lt; 5; must be individually determined to be at &quot;nutritional risk&quot; by a health professional; meet State residency requirement; gross income ≤ 185% of FPL.</td>
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<td><strong>National School Lunch Program (NSLP)</strong> 11.7 billion</td>
<td>Low-income children; 30.5 million children; 19.8 million receiving free lunch; 2.2 million receiving reduced price lunch</td>
<td>Nutritionally balanced daily lunches conforming to the latest Dietary Guidelines for Americans standards; 1/2 daily nutrition requirements. Avg. reimbursement rate = $3.07/ free meal, $2.67/reduced price meal, in schools where 60% or more of meals are subsidized and meeting Healthy, Hunger-free Kids Act requirements (SY15/16)</td>
<td>Free lunch if income ≤ 130% poverty; reduced-price lunch if income ≤ 185% poverty. SNAP recipients automatically qualify for free meals.</td>
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<td><strong>School Breakfast Program (SBP)</strong> 3.9 billion</td>
<td>Low-income children; 14.1 million children; 11.1 million receiving free breakfast; 0.9 million receiving reduced price breakfast</td>
<td>Nutritionally balanced daily breakfast meeting latest Dietary Guidelines for Americans standards. Schools received $1.66-$1.99 per free breakfast, $1.36-$1.69 per reduced price breakfast, and $0.29 per paid breakfast, depending on overall school need (SY15/16).</td>
<td>Child eligibility rules are the same as NSLP.</td>
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Medicaid, the Supplemental Nutrition Assistance Program (SNAP, formerly the Food Stamp Program), the Supplemental Nutrition Program for Women, Infants, and Children (WIC), National School Lunch Program (NSLP), and School Breakfast Program (SBP). Medicaid is the largest means-tested program in the United States. It is the primary source of health insurance for low income children and provides a large range of both outpatient and inpatient services, including prenatal and post-partum care for mothers. Costs are shared by federal
and state governments, but each state manages its own Medicaid program within the federal guidelines. The Affordable Care Act of 2010 mandated access for all children living in families with incomes below 133% of the federal poverty line, and most states cover children to higher income levels. Medicaid benefits are often provided through managed care plans that contract with the state. In 2015, the program (together with the Children’s Health Insurance Program) covered approximately 45 million U.S. children at a cost of $91.7 billion. Medi-Cal is California’s Medicaid program, and together with California’s CHIP program, it reached 6.8 million children in 2015.

SNAP is a food assistance program provided for both adults and children living in households with incomes below 130% of the poverty line. It provides vouchers that can be used to purchase most types of food in grocery stores or other retailers. The average monthly benefit in 2014 was $257 per household, or $125 per person (Hoynes and Schanzenbach, 2015). In 2015 SNAP benefits were provided to 45.8 million individuals. Approximately 20 million of these were children. Under the CalFresh program in California, over 2 million children receive benefits every year.

While there is debate among economists about whether SNAP acts primarily as an in-kind transfer or an income transfer (e.g. Hoynes and Schanzenbach, 2009; Beatty and Tuttle, 2015), nearly all studies find that it increases families’ food expenditures. Prenatal and early life nutrition are in turn considered to be important determinants of later life health. If families respond to SNAP as they would to a cash transfer then SNAP may also affect children’s health outcomes by changing other parental expenditures and behaviors, or by reducing parents’ financial stress, which is also believed to affect child health.

The goal of the WIC program is to improve nutrition among pregnant women and children under the age of five who are considered to be at nutritional risk. Recipients must live in households with income below 185% of the poverty line or participate in the Temporary Assistance for Needy Families (TANF) or SNAP programs. Unlike SNAP benefits, which can be used to purchase a relatively wide range of foods, WIC benefits are specified for foods with high levels of protein, calcium, iron, and other specific vitamins. Recipients obtain these foods using vouchers or electronic benefit transfers at participating grocery outlets. Many WIC participants also receive nutrition education and referrals to health care and social services. In 2014 WIC benefits were provided to just under 2 million women and 6.3 million children at a total cost of $6.3 billion (Hoynes and Schanzenbach, 2015). Approximately 285,000 women and 980,000 children received benefits in California during 2015, at a cost of $1 billion.

The NSLP and SBP fund meals for low-income children in public schools. Students must live in households with income below 130% of the poverty line to receive free meals, and 185% of the poverty line to qualify for reduced price meals. The combined costs of the two programs in 2015 were $13.7 billion. Twenty-two million U.S. children were served by the School Lunch Program, and 12 million U.S. children were served by the SBP. In California, 3.1 million children received benefits under the School Lunch Program, while 1.6 million participated in the School Breakfast Program.

Together, these five programs comprise about 30% of United States’ federal government spending on children. Figure 1 provides additional detail on the relative importance of these programs. In 2015, federal expenditures on children totaled $471 billion, including outlays on all federal means-tested programs (such as those listed above, and programs like Temporary Assistance to Needy Families and Head Start) as well as refundable tax credits and other tax breaks to families (such as the Earned Income Tax Credit), and spending on education, child care, and foster care. A complete list of federal child-related expenditures is provided in Edelstein et al. (2016). When these expenditures are combined, children’s share of the federal budget is roughly 10% (Edelstein et al. 2016). Of this, tax provisions, such as dependent deductions, comprise approximately 40% of federal investments in children, but health and nutrition programs are the next two largest categories of spending. Child-related Medicaid expenses make up 17.6% of total expenditures on children, and child-related SNAP expenses are another 7%. Child nutrition programs including WIC, NSLP and the SBP are 5.6% of
total federal expenditures on children.

**Figure 1. Federal Expenditure on Children by Program, 2015**

*Source: Edelstein et al., 2016*

**Figure 2** shows that the importance of these programs has grown significantly since passage of the Personal Responsibility and Work Reconciliation Act of 1996, which lead to a substantial drop in the prevalence of cash assistance. In 1990 the primary safety net program was Aid to Families with Dependent Children (AFDC), which provided cash assistance to many (primarily single parent) low income families with children. Per capita spending on AFDC at that time was $134 per person. In 2015, nearly twenty years after the 1996 reform of welfare, cash assistance through the renamed TANF program was only $24 per person. It is clear that a large share of children who would have obtained AFDC benefits before welfare reform are no longer getting these benefits. At the same time, both Medicaid and SNAP benefits have increased greatly, with per person spending going from $310 and $112 per person in 1990 to $1,081 and $230 per person in 2015. These programs are thus both relatively, and absolutely, more important to the child safety net than they have ever been.

**Do Health and Nutrition Programs Make a Difference to Children’s Well-Being?**

Changes in the composition of safety net programs, along with increasing appreciation for the important relationship between early life health and other measures of well-being, have generated increased interest in documenting the effects of major health and nutrition programs on children’s short and long term outcomes. The studies described below are a subset of recent research, and are differentiated by their attention to the careful establishment of causal relationships. That is, they harness quasi-experimental approaches based on variation in policy parameters that compare “treatment” (or exposed to the program) and “control” (not exposed) groups of children.

Unlike the physical and biological sciences, where experiments and clinical trials are common, social scientists rarely have opportunities to evaluate the impact of government programs in truly experimental settings. Instead, they are often forced to glean information from correlational studies, many of which inaccurately describe correlations between program participation and children’s outcomes as program “effects” when they also reflect the effects of other factors that caused the family to participate in the program. For example, comparing the health outcomes of infants born to mothers who received WIC during their pregnancy to the health outcomes of infants whose mothers who did not receive WIC during their pregnancy, is likely to generate estimates of WIC “effects” that underestimate the program’s true impact because WIC participants are, in general, more disadvantaged than non-participants.

“Quasi” experimental research designs try to emulate real experimental settings by comparing outcomes among individuals who are very similar but receive differential exposure to a program because of differences in the timing of the program’s implementation or structure, geographic variation in determinants of program eligibility or benefits, or other program rules that create differential access among otherwise nearly identical individuals. This approach allows the researcher to differentiate true program effects from other family background characteristics that might be correlated with program participation, which is crucial for meaningful program evaluation. By using this type of policy variation to identify program effects, researchers can disentangle the effects of family characteristics that cause parents to enroll in safety net programs from the effects of the program itself.
I discuss the findings of recent research using these approaches below. When studies are confined to those that harness these strategies—which are the most plausibly “causal” —the findings are remarkably consistent. Taken as a whole, there is an emerging consensus that health and nutrition interventions lead to improvements in a broad range of short and long run outcomes. In addition to improving low-income children’s well-being and later life success, the findings also have implications for reducing future government expenditures.

**Figure 2. Per Capita Federal Expenditure on Means-Tested Programs, 2015 Dollars**

![Figure 2. Per Capita Federal Expenditure on Means-Tested Programs, 2015 Dollars](image)

*Source: WIC, SNAP, NSLP, and SBP®*

**Medicaid**

The Medicaid program has undergone many changes since its inception in 1965. Many of these changes have been designed to increase the number of low income individuals, particularly children, who are covered. States have had some degree of autonomy in the extent to which they have expanded their Medicaid program, and in when the changes have been adopted. This state level variation in generosity and timing has been used by social scientists to create “treatment” and “control”
groups of children whose outcomes can be compared.

In this vein, the impact of the 1980s and early 1990s Medicaid expansions on children’s health and well-being have been extensively studied. Until the 1980s, Medicaid coverage for pregnant women and children was primarily limited to families who received cash welfare under the Aid to Families with Dependent Children Program (AFDC). AFDC income eligibility thresholds varied by state, and were generally much lower than the federal poverty line, so similarly poor families had different abilities to access Medicaid, depending on the state in which they lived. Those living in states with higher AFDC income eligibility thresholds were more likely to be “treated” by Medicaid than those living in states with low AFDC income eligibility thresholds.

In addition, AFDC eligibility was largely restricted to single parent families with very low income. This meant that the vast majority of low income children and pregnant women living in two parent families were not eligible for Medicaid, nor were most unmarried women who were pregnant for the first time. States had the option of covering first time pregnant women and children who would otherwise be income eligible for AFDC, but only a small number of states did so. Intuitively, this means that prior to the 1980s we can think of low income children, pregnant women living in two parent families, and unmarried women who were pregnant for the first time as a “control” group.

Medicaid eligibility was expanded dramatically in the early 1980s with the specific intent of broadening coverage for low-income pregnant women and children who were not otherwise tied to the welfare system. Pregnant women who enrolled in Medicaid received coverage for prenatal care and services, hospital and postpartum care, and (at least) one year of Medicaid eligibility for their newborns (Currie, 1995). Many women also received counseling from medical providers about how to enroll in other social safety net programs, such as WIC (Miller and Wherry, 2015). Medicaid coverage was also extended to children under the age of five who were born after September 30, 1983 and were living in families that met the AFDC income requirements. Thus, many children with the same income and demographic characteristics as the “controls” described above, became “treated” as a result of the expansions. Researchers are able to obtain estimates of the program’s impacts by comparing these treatment and control groups.

Between 1986 and 1990 a series of additional changes led to further expansion of coverage, and these changes provided researchers with additional treatment and control groups that are determined by differences in the timing and extent to which states broadened eligibility. Initially coverage was expanded to pregnant women who were resource eligible for AFDC regardless of family structure; then states were given the option of covering pregnant women and infants whose family incomes were below the federal poverty line (which was higher than the AFDC threshold). Throughout this period, states were first allowed, and then mandated, to increase the eligibility income limits and the age limits for child coverage. By 1990 all pregnant women and children under the age of six with family incomes below 133% of the poverty line were eligible for Medicaid, as well as all children under the age of 19 and born after September 30, 1983 with family incomes below 100% of poverty line.9

Researchers have used state differences in the timing and generosity of these expansions to create treatment and control groups who had differential access to Medicaid. This allows them to emulate an experimental setting, with which they can examine a wide range of program impacts. Taken as a whole, studies find that the expansions lead to contemporaneous gains in health insurance coverage (Buchmueller, Ham and Shore-Sheppard, 2015), and health care utilization (e.g. Currie and Gruber, 1996; Dubay, Joyce, Kaestner and Kenny, 2001; Dave, Decker, Kaestner and Simon, 2008; Currie and Gruber, 2001).

Arguably, the most influential study on the impact of Medicaid on children’s health outcomes is by Currie and Gruber (1996), who were the first to employ this methodological approach. They found that the program’s improvements in health were particularly pronounced for children who gained access to Medicaid while in utero: a ten percentage point increase in the fraction of children...
covered by Medicaid in utero reduced the incidence of low birth weight by .63% and reduced the infant mortality rate by 2.8% (Currie and Gruber, 1996). Subsequent studies suggest that these estimates are too large, however, at least in part because the timing and generosity of the state Medicaid expansions were partly correlated with other changes in states that affected birth weight and infant mortality. Research that has addressed these concerns finds mixed evidence demonstrating improvements in infant health (e.g. Dave, Decker, Kaestner and Simon 2008).

In contrast, studies that control for these factors do find consistent evidence that expanding Medicaid coverage has generated positive long-term effects. Focusing on health conditions that have been previously linked to the fetal environment, Miller and Wherry (2015) find that in utero exposure to the program reduces the likelihood of obesity and associated conditions in later life. They also find that early life Medicaid exposure reduces later life hospitalizations. In another study, Wherry and Meyer (2016) find that Medicaid expansions reduced mortality rates among black teens (but not among white teens). This suggests that the health enhancing effects of Medicaid are generated by mechanisms that do not directly affect birth weight or infant mortality.

Analyses based on other policy changes also produce strong evidence that childhood access to Medicaid makes a positive difference in later life health. Goodman-Bacon (2015) identifies the effects of in utero exposure to Medicaid by using geographic variation in program roll-out during the 1960s and 1970s, and finds that mortality fell more rapidly among infants and children in high Medicaid eligibility states. Using a similar design, Boudreaux, Golberstein and McAlpine (2016) find that childhood exposure to Medicaid reduced the likelihood of having a chronic health condition in adulthood.

Thus, there is a rapidly growing body of evidence that early life access to Medicaid improves later life health across a number of dimensions. These improvements are likely to reduce future health expenditures. They may also translate into improved earnings potential, which could reduce welfare participation and increase tax revenues. In fact, there is also strong evidence that childhood exposure to Medicaid improves later life economic outcomes. Using the 1980s Medicaid expansions, Brown, Kowalski and Lurie (2015) find that early exposure to the program had a positive effect on adult earnings and tax contributions. For women, each additional year of Medicaid eligibility from birth to age 18 is associated with additional cumulative wages by age 28 of $656. Earnings at age 28 are predictive of later life earnings, so this difference is expected to grow substantially as women age. While the authors find no evidence of wage improvements for men, they do find that an additional year of Medicaid eligibility is associated with a $127 increase in men’s cumulative tax payments to age 28, which would be expected to increase as they grow older. For women, the comparable effect of Medicaid on tax payments is $247.

Similarly, there are now several studies documenting that early life access to Medicaid lead to increases in educational attainment. Brown et al. (2015) find that one additional year of Medicaid eligibility increases the probability of having attended college by age 20 by 0.4 percentage points for women, and 0.2 percentage points for men. This is a non-trivial change as it implies that access to Medicaid throughout childhood (from birth to age 18) would increase the probability of attending college by about 7 percentage points for women and more than 3.6 percentage points for men. In 2014 about 40 percent of 18-24 year olds were enrolled in college. Cohodes, Grossman, Kleiner and Lovenheim (2016) find that a 10 percentage point increase in Medicaid eligibility during childhood decreases the high school dropout rate by 0.4 of a percentage point and increases college attendance by 0.3 of a percentage point, and Miller and Wherry (2015) find that a 10 percentage point increase in prenatal eligibility increases the probability of graduating from high school by 0.2 percentage points. Levine and Schanzenbach (2009) find that childhood Medicaid exposure is associated with an increase in test scores.

Supplemental Nutrition Assistance Program

Recent studies harnessing treatment/control research designs also show that SNAP improves
children’s short and long term well-being. Currie and Moretti (2008) and Almond, Hoynes and Schanzenbach (2011) compare birth outcomes among children born in counties that were early adopters of the Food Stamp program to birth outcomes among children born in counties that adopted the program a few years later. Figure 3, taken from Almond et al., shows that there were substantial cross-county differences in the timing of Food Stamp “roll-out.” Using this variation to create treatment and control groups of children who were otherwise very similar, both studies estimate that the incidence of low birth weight among infants who had prenatal access was substantially reduced. Almond et al. estimate that Food Stamp exposure lowered the incidence of low birth weight by about seven percent for whites and about three percent for blacks.

**Figure 3. Food Stamp Implementation by County**

![Map of Food Stamp Implementation by County](source.png)

Source: Hoynes and Schanzenbach (2009)

Applying the same methodology to longitudinal data available in the Panel Study of Income Dynamics, which allows them to follow individuals from birth through mid-life, Hoynes, Schanzenbach and Almond (2016) find that children who gained access to the Food Stamp program during its early years experienced a large decline in the prevalence of “metabolic syndrome” (e.g. obesity, high blood pressure, heart disease, diabetes) in adulthood, and an increase in individuals’ reporting that they were in good health. Specifically, children who were fully exposed to Food Stamps during their mother’s pregnancy and the first five years of life experienced a 0.3 standard deviation reduction in the incidence of later life metabolic syndrome. The program appears to be most beneficial when benefits are received before the age of four, which is consistent with biological evidence that early life is important in the development of glucose and lipid metabolism.

Hoynes, Schanzenbach and Almond (2016) also estimate that disadvantaged children with full access to the Food Stamp program from conception to age five were 0.2 standard deviations more likely to be economically self-sufficient in adulthood than those who did not have access. The estimate is largely driven by the effect of early life Food Stamp access on educational attainment. Consistent with some previous studies of other types of early life interventions, they find that the economic impacts are concentrated among girls. The effects for self-sufficiency are large and statistically significant for women, but small and not distinguishable from zero for men.

One disadvantage of the studies listed above is that their experimental setting relies on differences in children’s exposure during the early years of the program. It could be argued that program effects might be different today, as today’s children are growing up in a different policy and social environment. Another recent study makes headway on this concern by creating treatment and control groups that are generated by changes in immigrant parents’ eligibility for Food Stamps following the Personal Responsibility and Work Opportunity Reconciliation Act of 1996. These changes varied across states and over time. Specifically, in the wake of PRWORA, many documented foreign-born adults lost eligibility for Food Stamps. Eligibility was subsequently restored between 1998 and 2003, with the timing of restoration varying across states. East (2016) makes use of these policy changes to examine groups of immigrant children with differential access to Food Stamp benefits because of the state and year in which they were born. She focuses on health outcomes among U.S. born children of immigrant mothers who had a high school degree or less, and finds that an additional year of parental eligibility in early childhood reduces the likelihood that the child is reported to be in poor, fair or good health (relative to very good or excellent health) by 6%.
While the policy variation that provides the foundation for this study only allows analyses of a subset of SNAP recipients (immigrant children), an advantage is that, relative to the other causal studies listed above, it provides estimates for more recent generations of children growing up in a different environment from the children who gained access to Food Stamps in the early years of the program.

Supplemental Nutrition Program for Women, Infants, and Children

Using a similar approach to the Food Stamp study by Almond, Hoynes and Schanzenbach (2011), Hoynes, Page and Stevens (2011) emulate an experimental design by using cross-county variation in the timing of the WIC program’s initial implementation. Hoynes et al. find that when WIC is made available by the third trimester, average birth weight among infants born to women with low levels of education increases by approximately seven grams, and the probability of being born below the low birth weight threshold falls by 1.4%. The effects appear to be most pronounced in poor counties. Haeck and Lefebvre (2016) employ a similar approach to study a similar program in Canada and find evidence of even larger effects.

While the Hoynes et al. paper is based on children growing up in the 1970s, Rossin-Slater (2013) extends this research design to more recent 2005-2009 cohorts by using administrative data on the locations and dates of all WIC clinic openings and closings that occurred in Texas during the time period. Like Hoynes et al. (2011), she links the program data to infant health data from U.S. Vital Statistics. An important innovation, however, is that she is able to identify siblings. This allows her to compare outcomes across infants born to the same family, who had differential access to WIC because of changes in the program’s local availability. This allows her to control even more tightly for family background characteristics that might affect both an infant’s health, and the probability of participation in WIC. Her data also provide information on WIC food receipt, a wide range of pregnancy behaviors, and on breastfeeding at the time of hospital discharge. She finds that WIC is associated with an average increase in birth weight of 27 grams that is mostly concentrated on the middle of the birth weight distribution. She also finds limited evidence of a reduction in the probability of being a low birth weight baby. Finally she documents that WIC has a positive effect on breastfeeding for women with a high school diploma or less (an increase of about 6% at the time of hospital discharge). Given the positive linkages that have been documented between breastfeeding and later health (Eidelman and Schanler, 2012), this finding is suggestive of longer-term health effects.

Careful quasi-experimental studies of WIC’s long term effects on health and economic success have not yet been conducted, but a separate literature has documented that low birth weight is a predictor of many measures of future well-being, including future earnings (e.g. Black, Devereaux and Salvanes, 2007; Royer 2009), so the finding that WIC improves birth weight is indicative of longer term effects beyond its important impact on birth weight and breastfeeding.

National School Lunch Program and School Breakfast Program

Unlike studies of Medicaid, SNAP and WIC, the results of studies on the National School Lunch Program and School Breakfast Program that come closest to experimental designs have produced a less consistent set of results. In the only study to examine long term program impacts, Hinrichs (2015) looks at the educational effects of the NSLP by comparing educational attainment among children who were differentially exposed to the program because of early changes in the funding formula that affected the allocation of NSLP dollars across states. He finds that a ten percentage point increase in access to NSLP lead to increases in completed schooling (about one additional year of education for men, and a little over a third of a year of education for women) but did not affect children’s long term health outcomes.

On the other hand, studies that use other methodologies to simulate “treatment” and “control” conditions find less evidence of positive effects. As noted earlier, to qualify for NSLP family income needs to be below 130% (free meals) or 185% (reduced meals) of the poverty line. Schanzenbach (2009) compares students whose family incomes are just on either side of these
thresholds, and finds that those who qualify for a school lunch subsidy are 16% more likely to be obese than students who just miss qualifying for the subsidy. Using the same methodology, Millimet, Tchernis and Husain (2010) find similar effects. These findings are worrisome, as childhood obesity predicts a number of adult health problems, but several studies also document that NLSP succeeds at improving nutrition and food security among children (e.g. Gleason and Suitor, 2003; Nord and Romig, 2006). Additional research is clearly needed to sort out these results.

The SBP program has undergone several policy changes that provide researchers with opportunities to study its impacts by forming “treatment” and “control” groups of children. Frisvold (2015) makes use of state variation in statutes requiring school participation in the SBP, following the Child Nutrition Act of 1989. In some states, when a certain fraction of students qualified for free or reduced price meals, schools were mandated to provide the SBP. The fraction of students needed to “turn on” this requirement varied across states but was usually between 10 and 40%. Frisvold compares achievement outcomes for students attending schools with higher and lower fractions of qualifying children that were located in states with different thresholds. He also compares outcomes among students attending schools that were close to, but on either side of, the threshold. Across these different methodological approaches, he finds that participation in the SBP improves test scores in math by around 8% of a standard deviation. As with the NLSP, there is some evidence that these test score improvements may result from improvements in dietary quality (Battacharya, Currie and Haider, 2006).

**Policy Implications**

The research summarized above makes clear that large scale public health and nutrition interventions provide far reaching benefits for poor children. Although improvements in the outcomes described above represent clear increases in child well-being, they will not be immediately transparent in the official U.S. poverty measure because it only counts cash income and provides no information about well-being conditional on being poor. Similarly, point in time measures of poverty do not reflect reductions in poverty that will occur in the future as a result of programs that increase later life earnings and health. Nevertheless, because the programs described above increase educational attainment, adult health, earnings, and overall self-sufficiency, they are crucial levers towards reducing the intergenerational transmission of poverty.

Comprehensive cost-benefit analyses of health and nutrition programs that take the full range of benefits described above into account are non-existent, but they are crucial to determining whether the programs are worthwhile investments in children. Recent legislative discussions suggest that not all policymakers consider that the costs of these programs are worth sustaining. The best evaluation to date is provided by Brown, Kowalski and Lurie (2015) as part of their estimation of the long term effects of childhood exposure to Medicaid. As described earlier, the authors find that the increased childhood access to Medicaid that occurred as a result of the 1980s and 1990s expansions to Medicaid and the State Children’s Health Insurance Program lead to increased tax payments in later life, reductions in the probability of receiving Earned Income Tax Payments, and, for women, higher wages.

They go on to use their estimates of the effect of Medicaid on children’s later life economic outcomes to consider the relative costs and benefits associated with the program. Using data from the Medicaid Statistical Information System, they estimate that the government spent $872 for each additional year of Medicaid eligibility induced by the expansions. Putting this together with the estimated increase in tax payments, they estimate that the government recoups at least 56 cents of each $1 spent on childhood Medicaid by the time the exposed children are age 60. This is a lower bound estimate. Under alternative, reasonable, assumptions, the government recoups all of its investment by the time the child is age 36. Importantly, these estimates do not take into account the government savings that accrue after age 60. Nor do they include any savings in health care costs as a result of individuals’ improved health.

Similar estimates are not available for SNAP
or WIC. By imposing a number of assumptions, however, and applying them to Hoynes et al.’s (2016) estimates of the SNAP program’s long term effect on earnings, I can provide some simple intuition regarding the program’s relative costs and benefits. To do this I follow the approach used by Kline and Walters (2014) to estimate the long term earnings benefits associated with the Head Start program. They predict what future earnings would be for current Head Start participants if Head Start were not available by combining an estimate of the intergenerational income elasticity (Lee and Solon, 2009) with their own estimate of the average earnings of current participating households relative to the average American household, then applying this estimate to Chetty, Friedman and Rockoff’s (2014) estimate of discounted lifetime earnings for the average American ($522,000 in 2010 dollars).

I conduct a similar exercise, replacing Kline and Walters’ estimate of average Head Start earnings with an estimate of average SNAP earnings calculated from the 2016 March Supplement of the Current Population Survey. First, I calculate that in 2015 the average household participating in the SNAP program had earnings that were 26% of the national average. This means that there is a 74% point gap between average SNAP household parents’ earnings and U.S. average earnings. However, Lee and Solon’s estimate of the correlation between parent and child income (0.4) implies that only 40% of that gap will be passed on to their child. This suggests that the earnings gap between children who participated in SNAP and “average” children will narrow down to $((1-0.26)*0.4) = 30% when the children are adults. I, therefore, calculate the typical lifetime earnings of SNAP children by multiplying Chetty, Friedman and Rockoff’s estimate of average lifetime earnings ($522,000) by 0.7. I then discount to age 3 and convert to 2015 dollars. Putting all of this together, I predict that in the absence of SNAP the average lifetime discounted earnings of current SNAP children would be $335,488 (in 2015 dollars). Suppose that the earnings increase associated with full access to the SNAP program between conception and age five is 3%. This choice is motivated by combining Hoynes et al.’s (2016) estimate of the program’s effect on the probability of graduating from high school (22% increase) with an estimate of the wage return to a high school diploma of 13%. If I assume that SNAP participation increases later life earnings by 3% then the increase in lifetime earnings associated with SNAP exposure during the first five years of life is approximately $10,100 ($335,488*0.03). I use this as an estimate of the SNAP benefit per person.

To calculate the per child cost, I use the estimates reported in Table 1. I calculate that in 2015 federal SNAP expenditure per child participant was $1,660. I multiply this number by 5 to generate an estimate of total SNAP expenditures per child participant between birth and age five. Then, using the USDA Food and Nutrition Service estimates of total federal SNAP expenditures and program participation, I calculate federal SNAP expenditure per adult to be $1,583. I use this as an estimate of the cost of providing SNAP during the prenatal year. Putting the two estimates together, the relevant measure of the cost of this intervention is $9,883 in 2015 dollars. Thus, the long-term earnings benefits of the program appear to be comparable to the program’s costs.

In addition to the government savings that are implied by these programs’ effects on children’s eventual labor market outcomes, the improvements in infant and later life health also generate reductions in health care expenditures. As an example, a recent report by the Kowlessar et al. (2013) estimates that the cost associated with an infant’s hospital stay immediately after birth is approximately $27,000 for a low birth weight newborn, compared to $3,000 for all newborns. Looking beyond the initial hospital stay, the March of Dimes Foundation (2008) calculates that in the first year of a life a typical birth incurs medical costs of approximately $4,500 per infant whereas for a premature or low birth weight baby these costs are closer to $50,000. These estimates are likely lower bounds as they exclude any extra medical burden experienced by mothers of low birth weight infants. Approximately 319,000 infants were born weighing less than the low birth weight threshold in 2014 (Hamilton et al., National Vital Statistics Report, 2015). Thus, even small reductions in the fraction of low birth weight infants could lead to
substantial reductions in health care expenditures, even in the first year of life. Many of these costs are borne by the public. For example, another March of Dimes report by Smith et al. (2014) calculates that the excess cost to Medicaid that results from a premature or low birth weight is about $12,000 per child (in 2009).

Reductions in the prevalence of later life metabolic syndrome also generate significant cost savings. Yang et al. (2013) estimate that the average per person cost of diabetes is approximately $11,000 per year, while the NCD Risk Factor Collaboration (2016) estimates direct medical costs per person of $4,700 per year. Zhou et al. (2014) estimate that the additional direct lifetime medical cost of being diagnosed with type 2 diabetes at age 40 is approximately $125,000 per person. Similarly large estimates exist with respect to cardiovascular disease (e.g. Mozaffarian et al., 2016). Obesity is also associated with higher medical costs. Finkelstein et al. (2009), for example, find that obesity was associated with additional medical costs of approximately $1,400 in 2006.

Multi-generational Effects of Health and Nutrition Programs

Taken as a whole, the existing literature generates two broad conclusions. First, many widespread public health and nutrition interventions targeted at children have substantial positive benefits that last well into adulthood. Second, from a policy perspective, the magnitudes of these effects are substantive. These calculations likely understate the full range of program benefits, however. Studies in both economics and biology suggest that the effects may endure to the next generation. The biological literature provides an accumulation of evidence based on animal experiments that the prenatal and early life health environment has trans-generational effects. As an example, studies have documented that rats that are malnourished before or during pregnancy produce offspring with smaller brains and reduced cognition even if the offspring receive sufficient nutrition after birth. Importantly, these effects are not only observed in the immediate offspring, but are present in the next generation as well (Zamenhof et al., 1971; Cowley and Griesel, 1966; Jimenez-Chillaron et al., 2009; Radford et al., 2014; Masuyama et al., 2015). Similar multi-generational patterns have been found with in utero exposure to alcohol, stress and smoke (Lam et al., 2000; Nizhnikov et al., 2016; Ward et al., 2013; Grundwald and Brunton, 2015; Rehan et al., 2012; Maritz and Mutemwa, 2014). One explanation for this pattern is that the biological precursors of the ova and sperm cells that will produce the next generation are already present at the fetal stage, and are therefore exposed to any insult experienced by the fetus.

While we cannot replicate this type of experimental approach in humans, there is every reason to believe that similar patterns will exist. Indeed, a handful of studies have documented that the impacts of widespread negative health shocks such as famines or influenza persist to the second generation’s outcomes. Painter et al. (2008) investigate the multi-generational impacts of the Dutch Hunger Winter of 1944-1945 which reduced the food consumption of a previously well-nourished population by more than 75% for a period of seven months. They find that the offspring of those who were prenatally exposed experienced worse health in later life. Van den Berg and Pinger (2016) investigate the trans-generational effects of pre-pubertorial exposure to the German famine of 1916-1918 and find evidence of mental health effects on later generations, which they attribute to biological rather than social processes. Looking beyond the effects of extreme nutritional deprivation to the trans-generational impacts of disease exposure, Richter and Robling (2013) find that the children of those who were prenatally exposed to the 1918-1919 influenza pandemic grew up to have lower levels of educational attainment.

These findings hint that the association between low family income and poor health that emerges in childhood and extends into adulthood might be passed on to the next generation of children through biological processes. Alternatively, impaired health in later life will also affect adults’ ability to work, and increase their chances of being poor. This would also likely contribute to the next generation’s health, and their eventual chances of escaping poverty. Existing multi-generational studies are not sufficient evidence, as they are based on extreme, negative, and historic health events.
There is still a great deal of work to be done to understand both the degree of, and mechanisms by which more common health experiences of low income children in the United States today will affect the next generation. Nevertheless, existing evidence that the effects of the early life health environment persist across generations suggests that the positive health effects of programs like WIC, SNAP, and Medicaid may also have the capacity to extend beyond the treated generation through their effects on nutrition, stress reduction or direct health interventions. In addition, as described above, there is evidence that early life exposure to Medicaid and SNAP affects individuals’ later life educational attainment and earnings. Moreover, we know that increasing parent’s education and income has positive, causal, effects on children’s health and economic outcomes. For example, studies of the intergenerational effects of the Earned Income Tax Credit find that it improves child health and educational achievement (Dahl and Lochner, 2012; Hoynes, Miller and Simon, 2015; Strully, Rehkopf and Xuan, 2010). Therefore, separate from biological mechanisms, early life public health and nutrition programs may break the cycle of poverty through their effect on the first generation’s economic well-being, the benefits of which then transmit to the next generation.

Knowing the magnitude of these spill-over effects onto later generations’ health is crucial for good policy. Substantive multiplier effects would suggest that existing cost- benefit calculations underestimate the true value of public health and nutrition programs.

To date, however, no study has looked at whether the benefits of the U.S. safety net transmit beyond treated cohorts to subsequent generations. My investigation of multi-generational effects begins with the Medicaid program, the largest source of health-related services for low-income children in the United States. Together with Chloe East (University of Colorado-Denver), Sarah Miller (University of Michigan) and Laura Wherry (University of California, Los Angeles), I build on research methodologies that document effects of Medicaid on the first generation, to begin to look at whether the benefits of the program extend to the second generation.

To do this, I harness data on infant health outcomes from the 1996-2013 U.S. Vital Statistics Natality files. These files contain information on a variety of markers of health at birth, including birth weight and length of gestation, for nearly every individual born in the United States. The files also contain information about the infant’s mother, including her year and state of birth. Using this information, I am able to link measures of Medicaid eligibility, which varied across states and over time, to each mother (first generation) from her conception year through to her late teenage years. I then compare birth outcomes among “treatment” and “control” infants (second generation) so defined based on their mothers’ childhood Medicaid access. Figure 4 provides further insight into how the data are constructed.

First, I apply the Medicaid rules to information on families’ income and other family characteristics that is available in the Current Population Survey (CPS). The CPS is a nationally representative sample of individuals in the United States that is conducted monthly; the CPS is jointly sponsored by the U.S. Census Bureau and the U.S. Bureau of Labor Statistics. Using information on state Medicaid eligibility rules in each year, I am able to estimate the fraction of children covered by Medicaid in each state and year, and for each year of childhood, by applying the eligibility rules to information in the CPS on the child’s age, family income, parents’ marital status, and other family characteristics. I then link these predicted eligibility measures to each birth record in the Vital Statistics files, based on the mother’s state and year of birth. This allows me to link estimates of the mother’s Medicaid access during her own childhood with measures of her offspring’s later health outcomes.

The nature of my question requires that I focus on variation in Medicaid eligibility several decades before the second generation is born (as peak fertility occurs between ages 25 and 35). My experimental design therefore makes use of changes in Medicaid eligibility rules during the 1980s. These are the Medicaid expansions that have been used in most existing studies of the effect of the program on the first generation’s long-term outcomes. As previously described, the Medicaid expansions of the 1980s lead to a dramatic
increase in the number of covered children. I use the Vital Statistics information on birth weight.

**Figure 4. Construction of Medicaid Access**

- **Start with:** Medicaid coverage rules (vary by state, year, child’s age, and family income)
- **Apply to:** Individuals in Current Population Survey; using family income, other characteristics, including child’s state of residence
- **Generates:** Measure of predicted childhood Medicaid eligibility that varies by state and year of birth
- **Link to:** Mothers in the U.S. Vital Statistics Natality Files by their state and year of birth
- **Observe:** Health of mothers’ newborn infants

gestation to construct indicators for whether the infant was low birth weight (below 2500 grams), very low birth weight (below 1500 grams), born preterm, or small for gestational age.¹⁶

As discussed above, these indicators are strongly correlated with other measures of infant health, and have also been shown to be predictors of later life socio-economic success. I also consider the APGAR score, which is based on tests done shortly after birth, and is used to quickly summarize the health of newborn children.

An important caveat to this analysis is that cohorts who were born during the 1980s Medicaid expansions have not completed their fertility. In other words, my analyses are restricted to births to young mothers.

**Table 2** provides early results from this project. The estimates represent the effects of a ten percentage point increase in the first generation’s prenatal Medicaid eligibility on the second generation’s health at birth. These early findings strongly suggest the effects of early life access to Medicaid are not confined to the treated generation, but also spill over to their offspring. In particular, a ten percentage point increase in mother’s prenatal eligibility leads to an increase in the average gestation length of 0.03 weeks and a decline in the incidence of preterm birth by 0.25 percentage points. Given that about 11% of births in the sample are preterm, this is a large decrease—about 2.3%.

We see a similar pattern when we look at the effects of the first generation’s access to Medicaid on the second generation’s birth weight. A ten percentage point increase in the first generation’s prenatal eligibility increases the second generation’s average birth weight by 8.7 grams and reduces the probability of being born below the low birth weight threshold by 0.23 percentage points. The effect on low birth weight does not appear to be driven by the reduction in preterm births alone; in column 6, we see that the probability that an infant is born small for gestational age also decreases, by 0.22 percentage points.

These estimates are based on analyses that control for a wide variety of other state and time varying factors, including general state trends in infant health. I also include variables that measure Medicaid access at other ages of childhood but find little consistent evidence of effects that persist to the second generation’s health. This finding is consistent with a large number of studies that highlight the particular importance of early life health on later outcomes.

Many of these preliminary estimates are large.¹⁷ This may be driven in part by the likely
Table 2. Estimated Effects of First Generation Medicaid Exposure on Second Generation’s Birth Outcomes

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Length of Gestation</th>
<th>Preterm Birth</th>
<th>Average Birth weight</th>
<th>Low Birth weight</th>
<th>Very Low Birth weight</th>
<th>Small for Gestational</th>
<th>Apgar Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated Effect of First Generation’s Prenatal Medicaid Eligibility</td>
<td>0.293*</td>
<td>-0.025*</td>
<td>86.82**</td>
<td>-0.023*</td>
<td>-0.005</td>
<td>-0.0022**</td>
<td>0.014</td>
</tr>
<tr>
<td></td>
<td>(0.156)</td>
<td>(0.013)</td>
<td>(38.30)</td>
<td>(0.011)</td>
<td>(0.004)</td>
<td>(0.010)</td>
<td>(0.041)</td>
</tr>
<tr>
<td>Mean of Outcome</td>
<td>38.77</td>
<td>0.114</td>
<td>3259</td>
<td>0.073</td>
<td>0.013</td>
<td>0.093</td>
<td>8.851</td>
</tr>
</tbody>
</table>

Notes: Standard errors are in parentheses. * statistical significance at 10% level, ** statistical significance at 5% level.

possibility that increases in Medicaid participation during the 1980s occurred among populations who were at greatest risk of health problems. Further expansions of the Medicaid program (or the CHIP expansions), which extended the program to reach families that are relatively less needy, would be expected to have smaller effects. It is also important to keep in mind that second generation estimates are larger than estimates produced by previous studies that have focused on the first generation’s birth outcomes. This suggests that there may be complex biological and economic mechanisms generating these spillovers. It also highlights the potential importance of taking multi-generational effects of policy interventions into account when determining their efficacy. Taken as a whole, these estimates provide the first suggestive evidence that Medicaid’s well documented effects on children’s short and long term well-being persist beyond their own health and economic outcomes to the next generation. Since intergenerational effects have not previously been considered in the evaluation of health and nutrition programs, the benefits of these programs have likely been underestimated.

Conclusion

In this paper, I have made an evidence-based case that large scale U.S. public health and nutrition programs provide far reaching benefits for poor children, and that these programs are crucial levers towards reducing the intergenerational transmission of poverty. In addition to providing a brief overview of these programs, I have summarized findings from the set of studies that come closest to emulating experimental conditions by using over time and geographic variation in program parameters to estimate program effects on children. When focusing on studies that carefully invoke these methodologies the findings are remarkably consistent—indicating that health and nutrition interventions lead to improvements in a broad range of short and long run outcomes. My own preliminary analyses also suggest that the positive impacts of the Medicaid program may extend even further than previously realized, by spilling over onto the next generation’s health. Taken as a whole, current research strongly suggests that the return to these government investments in children likely exceeds the costs. Health and nutrition interventions appear to be important tools towards breaking the cycle of poverty.
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UC CENTER SACRAMENTO 2016-2017


**Reports**


Smith, Mark W., Kay Miller, Susan Raetzman, Anika Hines, and Michael Udwin. 2014. “The excess cost of premature or low birth weight births and complicated deliveries to Medicaid.” Truven Health Analytics. http://images.info.truvenhealth.biz/Web/TruvenHealthAnalytics/%7Bb0c5901d2-056a-4d78-8aa5-1f5499e79ee7%7D_GOV_15222_1214_MarchOfDimes_rebrand_WEB.pdf


Endnotes

1 The Children’s Health Insurance Program (CHIP) was created in 1997 to provide public health insurance to low-income children in families with incomes too high to qualify for Medicaid but who could not afford private insurance. States were given block grants for a ten-year period, with the amount of the block grant depending on the number of uninsured children and the state’s relative per capita health care costs. Compared with Medicaid, states were given more flexibility in designing their CHIP programs. In some states there is effectively no difference between Medicaid and CHIP. In other states CHIP is a separate program from Medicaid, with a different set of benefits and eligibility rules. In 2015 36.8 million children were enrolled in Medicaid and another 8.4 million children were enrolled in CHIP. Child related Medicaid expenditures were $82.8 billion. Expenditures on CHIP were $8.9 billion (Edelstein et al., 2016).

2 The guideline is slightly higher for residents of Alaska and Hawaii.

3 CalFresh is California’s SNAP program.

4 Nutritional risk is broadly defined and most income eligible families meet this requirement. Factors determining nutritional risk can include: low weight gain during pregnancy, inadequate physical growth during infancy and childhood, anemia, dietary deficiencies, over-weight, homelessness, migrancy, drug abuse and alcoholism.

5 These numbers are taken from Edelstein et al. (2016). As a fraction of overall government spending, however, these programs are small: in 2015 Medicaid expenditures on children accounted for 2.2% of total federal outlays, SNAP child-related expenditures accounted for 0.9% of federal outlays, WIC comprised 0.15% of federal outlays and the NSLP and SBP programs together constituted 0.43% of federal outlays.

6 http://www.urban.org Child nutrition category includes NSLP, SBP, the Child and Adult Care Food Program (CACFP), the Summer Food Service Program (SFSP), and Special Milk. Total list contains over 80 federal programs that target participants’ health, nutrition, income security, education, housing, and more. Estimated total federal expenditures on children are $471.2 billion.

7 Some of the increases in Medicaid spending reflect increases in the overall cost of health care. Some of the changes in SNAP spending reflect eligibility changes which made it easier to get program benefits during the Great Recession.


9 The Omnibus Budget Reconciliation Act of 1981 limited the ability of states to provide AFDC payments to first-time pregnant women but authorized a new optional Medicaid eligibility category for this group. The Deficit Reduction Act of 1984 mandated Medicaid access for all first-time pregnant women, as well as pregnant women in two-parent families whose principal earner was unemployed, with incomes below the AFDC eligibility thresholds. The newly eligible women would have closely resembled the already-covered AFDC population in terms of income but would not have previously qualified due to categorical eligibility requirements associated with AFDC. The Consolidated Omnibus Budget Reconciliation Act of 1985 removed the AFDC categorical eligibility requirement for pregnant women, allowing all pregnant women with incomes below AFDC eligibility thresholds to enroll in Medicaid regardless of their family structure. Finally, the 1986 Omnibus Budget Reconciliation Act gave states the option of expanding Medicaid eligibility to pregnant women in families earning up to 100 percent of the Federal Poverty Level. Unlike the previous two expansions, this expansion was optional and left to the discretion of the states.

10 At the time of the study approximately 6.8% of births in the United States were below the low birth weight threshold and the infant mortality rate was approximately 1%. Today, approximately 8% of
U.S. births are low birth weight, and the infant mortality rate is .06%.

11 Source: Hoynes and Schanzenbach (2009)

12 The estimate is not quite statistically significant at conventional levels of significance (p-value is 0.14).

13 Their index of self-sufficiency is based on the individual’s level of education, earnings, poverty status and participation in public assistance programs. Their index of metabolic syndrome is based on measures of obesity, high blood pressure, diabetes, heart attack and heart disease.

14 The Supplemental Poverty Measure does include many in-kind transfers.

15 Two useful reviews are provided by Hochberg et al. (2011) and Gluckman et al. (2008).

16 Infants are designated as small for gestational age if they are at the 10th percentile of the birth weight distribution given the number of weeks of pregnancy.

17 We are continuing to explore whether other factors could be responsible for the large magnitude of these estimates but have not yet found evidence to this effect. We are in the process of collecting additional control variables to examine further mechanisms.

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