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Contemporaneous and Long-term Effects of Children's Public Health Insurance Expansions on Supplemental Security Income Participation

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ABSTRACT

Project Number

D-MP-17-06

Title

Contemporaneous and Long-term Effects of Children's Public Health Insurance Expansions on Supplemental Security Income Participation

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Date

May 2018

Key findings and policy implications

This study explores the interplay between two important public programs for vulnerable children: Medicaid and the Supplemental Security Income (SSI) program. Medicaid eligibility for children expanded in the late 1990s and early 2000s, primarily due to the creation of the Children's Health Insurance Program (CHIP). We use a measure of simulated eligibility as an exogenous source of variation in Medicaid generosity to identify the effects of Medicaid eligibility expansions on SSI outcomes. Simulated eligibility varies over states and time only because of state-specific Medicaid thresholds.

We find the following:

- Increased Medicaid generosity for children leads to reductions in SSI applications and awards in states where SSI recipients did not automatically receive Medicaid. A 10 percentage point increase in the estimated share eligible for Medicaid (or 21 percent relative to the mean) was associated with an 11 percent decrease in SSI applications. We attribute the difference in findings to the higher transactions costs associated with entering Medicaid via SSI in such states.
- In the long run, increased Medicaid eligibility during childhood appears to reduce adult SSI applications to some extent, consistent with recent findings that Medicaid coverage in youth improves adult health and economic outcomes. We found that one more year of eligibility during childhood reduced SSI applications by about 3 percent for those ages 20 to 28.

The policy implications of the findings are:

- We find some evidence of substitution away from SSI when children were able to obtain Medicaid coverage elsewhere in states with higher transaction costs for Medicaid enrollment. This substitution could result in significant fiscal cost savings from children who would be accepted to SSI but choose not to apply when there is another way for them to obtain Medicaid. In most states with additional criteria to receive Medicaid, the additional

criteria is simply filing an application that will be accepted with certainty. Therefore, most new SSI awardees would end up receiving health insurance coverage through Medicaid anyway. Expanding Medicaid therefore reduced expenditures on SSI benefit payments in these select states. This implies that expanding Medicaid could induce cost savings in federal benefit programs.

- Increased Medicaid exposure during childhood can improve health and economic outcomes, leading to reduced eligibility and applications to SSI as young adults. This rules out complementarity between SSI and Medicaid, whereby Medicaid beneficiaries learn about and eventually apply for SSI through their Medicaid coverage, either by further understanding the social safety net landscape or by recommendations to apply from health professionals.
- If proposals to reduce Medicaid eligibility or funding go into effect, some of the cost savings associated with the cuts could be lost due to increases in SSI program participation in states where the two programs appear to be substitutes. The effects might accumulate over the course of many years if they influence long-term participation. Similarly, any expansion in Medicaid might not be as costly to the federal government as initially expected because it might be accompanied by reductions in SSI participation. As such, understanding the potential spillover effects on childhood SSI receipt is an important input for the full accounting of potential benefits and costs of Medicaid and CHIP eligibility.

I. INTRODUCTION

There is broad interest in the interaction between social programs, specifically how changes in eligibility for one safety net program affect participation in others. The relationship between public health insurance coverage through Medicaid and participation in other programs is particularly relevant given current debates about the optimal level of Medicaid coverage. Under the Affordable Care Act (ACA), 31 states and the District of Columbia expanded Medicaid to cover most households with income up to 138 percent of the federal poverty level (FPL). However, not all states chose to expand Medicaid, and Congress recently considered substantial cuts to Medicaid as part of efforts to repeal the ACA.

The relationship between Medicaid and Supplemental Security Income (SSI) participation is important to policymakers. SSI provides cash benefits to low-income households where a person, either adult or child, has a disability, and nearly always confers Medicaid coverage to the recipient. Therefore, the availability of Medicaid through a different route could lead to substitution away from SSI if obtaining Medicaid coverage was an important driver of SSI participation. Though there has been extensive research on the effects of changes in providing public health insurance on health and labor market outcomes (for example, Finkelstein et al. 2012; Dague et al. 2017; Kaestner et al. 2017), the literature on the interaction of Medicaid and participating in other safety net programs is relatively sparse, with inconclusive results. Burns and Dague (2017) and Maestas et al. (2014) found evidence of substitution between Medicaid and SSI for adults; Schimmel Hyde et al. (2017), Chatterji and Li (2017), and Baicker et al. (2014) found generally insignificant effects of increases in Medicaid coverage on SSI and Social Security Disability Insurance outcomes.

Enacted in 1997, the Children's Health Insurance Program (CHIP) was designed to help close coverage gaps for children from low-income families who cannot afford private coverage but whose household incomes are too high to qualify for Medicaid. The rollout of CHIP, which occurred in the late 1990s through the early 2000s, along with concurrent Medicaid expansions in some states to children ages 15 to 17 in families with incomes at or below the FPL, led to a dramatic increase in children's public insurance eligibility. From 1997 to 2010, the percentage of children publicly insured rose from about 20 percent to 45 percent (Leininger and Levy 2015).

In this paper, we study the effect of CHIP-era expansions in Medicaid eligibility on children's contemporaneous SSI participation, and the long-run effects of greater Medicaid eligibility during childhood on participating in the SSI program as a young adult. To isolate the plausibly causal effect of Medicaid and CHIP eligibility on SSI outcomes, we used the simulated eligibility approach first introduced by Currie and Gruber (1996a, b). Several recent, related studies have also followed their approach (for example, Brown et al. 2017; Miller and Wherry 2017). Our approach isolates variation in the generosity of the coverage expansions within (1) state over time and (2) state across ages to estimate the causal impact of Medicaid eligibility on SSI outcomes. This approach exploits the eligibility expansions that occurred in all states by taking advantage of the variation in the timing and extent of the expansions across states and across age groups within states.

On average, we found no evidence of a meaningful impact of the CHIP-era insurance expansions on contemporaneous SSI applications and awards among children. Increases in simulated eligibility did not affect SSI applications or awards; point estimates are small and fairly precisely estimated.

Although the aggregate results suggest no effect of Medicaid eligibility on SSI applications and awards, there is substantial state heterogeneity in this relationship. In the 33 states where an SSI recipient automatically receives Medicaid, there was a small, statistically insignificant relationship between Medicaid eligibility expansions and SSI applications. However, in the 18 states with additional criteria to receive Medicaid, increases in Medicaid eligibility led to a large, statistically significant reduction in child SSI applications; a 10 percentage point increase in simulated eligibility (an approximate 21 percent increase over the baseline rate of 47 percentage points) was associated with an 11 percent decrease in SSI applications. We attribute the larger impact in these states to the fact that the expansion led to a larger reduction in the transaction costs of entering Medicaid in these states relative to other states. Before the expansion, the primary transaction cost in states with additional criteria was needing to file a separate application for Medicaid. Further, in some of these states the income criteria were more stringent to qualify, meaning that in some states SSI recipients might not qualify for Medicaid. Transaction costs therefore fell more in states with additional criteria, indicating that the availability of an alternative route to Medicaid coverage might be particularly appealing to potential SSI applicants.

As a check on the causality of these estimates, we verified that changes in Medicaid eligibility at income levels above the SSI income threshold had no detectable effect on SSI applications or awards. Similarly, we also found no association between simulated eligibility and SSI applications and awards among the elderly (ages 65 and older), for whom the CHIP-era expansions providing health insurance to children should have had no effect. The primary results were also consistent across a series of robustness tests assessing sensitivity of the regression specification.

In the long-term, increased Medicaid eligibility during childhood appears to reduce adult SSI applications to some extent. We found that one more year of eligibility during childhood reduced SSI applications by about 3 percent for those ages 20 to 28. The relative reduction in awards was of a similar magnitude, though statistically insignificant. The effects were most pronounced for increases in eligibility during the teenage years. These findings are consistent with recent findings from Miller and Wherry (2017) that increased Medicaid eligibility improves long-term health and education.

II. INSTITUTIONAL BACKGROUND AND RELATED LITERATURE

A. SSI

SSI benefits provide a cash payment to help low-income parents care for their children with disabilities. To be eligible for benefits, children must meet the Social Security Administration (SSA) definition of disability and come from families with sufficiently low income and resources. The definition of disability means that a child must have a serious mental or physical impairment that has lasted or is expected to last a year or longer, or result in death.

Applying for SSI involves submitting paperwork and taking part in an interview at a local field office. This interview includes providing the local claims representative with information about every doctor, therapist, hospital, and clinic visited; medications; and names of schools attended along with teachers, psychologists, and therapists who have worked with the individual. Families must also provide information on income and resources in the form of pay stubs and bank account statements. The considerable effort required to submit an application might deter some families from applying (Deshpande and Li 2017). After collecting all of this information, the field office forwards the case to the state's Disability Determination Service (DDS). The DDS first determines if an individual meets the income test and then conducts a medical review to assess eligibility for benefits. It sends its decision to SSA, which may review the decision and either award or deny benefits. Applicants often appeal denials, and a substantial share of appeals result in awards—usually after many months, or even years.

The maximum monthly SSI payment in 2016 was $733. Generally, for every $2 increase in income, the SSI payment is reduced by $1. For children, who do not have their own income, parental income is deemed onto children, with a proportion of the parents' income considered in determining the benefit payment. There is not a defined income threshold for benefit payments; rather, a person is considered to be ineligible if the monthly payment he or she would receive is

$0. The rules for benefit offsets depend on the size of the household, the number of eligible children, and both earned and unearned income. Appendix A, Table A.1 shows the maximum income threshold to qualify for SSI as a function of the number of parents and children in the household. Assuming no unearned income, the threshold ranges from 177 to 235 percent of the FPL for most families. Assuming no earned income, the threshold to qualify for SSI is lower.

SSI eligibility almost always confers Medicaid eligibility to the recipient. Medicaid coverage can be particularly valuable for children with disabilities, because it covers a broad range of medical and supportive services at zero or minimal cost-sharing to families. In 32 states and the District of Columbia, child SSI recipients automatically receive Medicaid. In the remaining 18 states, SSI recipients must meet additional criteria to receive Medicaid benefits. For 7 states[1], the only additional criterion is filing a separate application that will be accepted with certainty. The remaining 11 states[2] have at least one additional eligibility criterion for recipients to also receive Medicaid benefits, such as less generous income thresholds for Medicaid; small shares of SSI recipients in these states are not eligible for Medicaid.

The SSI program serves as an important safety net program for poor children with disabilities, providing benefits to about 1.3 million children in 2015 (SSA 2015). More than two-thirds of child recipients had a qualifying behavioral health diagnosis; this share grew markedly with age, ranging from 11 percent for children ages birth to 3 to 80 percent of older children ages 13 to 17 (SSA 2015). The program serves a disproportionate number of older children, with about 120,000 children in the birth to 3 age range served in 2015 compared with more than 450,000 in the 13 to 17 age range (SSA 2015).

[1] Alaska, Idaho, Kansas, Nebraska, Nevada, Oregon, and Utah.

[2] Connecticut, Hawaii, Illinois, Indiana, Minnesota, Missouri, New Hampshire, North Dakota, Ohio, Oklahoma, and Virginia.

Child SSI applications and awards increased dramatically in the early 1990's due to the Supreme Court's *Sullivan v. Zebley* decision (493 U.S. 521), which eased disability criteria for children, particularly those with mental disorders, to qualify for SSI benefits (Levere 2017). In response to this increase, Congress tightened children's eligibility criteria as part of the Personal Responsibility and Work Opportunity Reconciliation Act of 1996. That legislation was followed by a decrease in child SSI enrollment (Deshpande 2016). Since 1997, no significant legislative changes have affected children's eligibility for SSI benefits, though the number of recipients has increased consistently over time.

B. Medicaid and CHIP

Medicaid is a critically important support for low-income children with special health care needs, including but not limited to those receiving SSI. Federal law requires that all state Medicaid programs cover a comprehensive set of services under the Early and Periodic Screening, Diagnostic, and Treatment benefit. Included in this definition are home-based long-term care services—which private insurance policies typically do not cover—for children whose medical needs might otherwise necessitate institutionalization. In contrast to private insurance, state Medicaid programs typically require either zero or very minimal out-of-pocket expenditures by beneficiary families. This combination of generous service coverage and low out-of-pocket costs offered by both Medicaid and CHIP constitutes a valuable benefit for medically vulnerable children in low-income families, including those covered by SSI.

Historically, Medicaid was targeted to certain categories of very low-income individuals, with eligibility typically tied to receipt of cash welfare benefits. Beginning in the mid-1980s, Congress instituted a number of incremental changes to the Medicaid program, effectively expanding Medicaid eligibility to low-income pregnant women and children not tied to the welfare system, with considerable state flexibility in the timing and size of the expansions.

Overall, the Medicaid expansions of the late 1980s and early 1990s substantially boosted the eligibility threshold for children.

The creation of CHIP in 1997 as Title XXI of the Social Security Act further increased public health insurance coverage for children. Enacted when the numbers of uninsured low-income children had been rising, the program sought to help close coverage gaps for low-income children whose families could not afford private coverage but whose incomes were too high to qualify for Medicaid. The rollout of CHIP, which was phased in during the late 1990s and early 2000s, along with concurrent Medicaid expansions to children ages 15 to 18 as a result of states' phasing in Medicaid eligibility to all children in poverty, led to a dramatic increase in public insurance eligibility for children, from about 20 to 45 percent from 1997 to 2010 (Leininger and Levy 2015). Illustratively, before the expansions, only three states had set Medicaid eligibility levels at or exceeding 200 percent of the FPL for all children up through age 18; when CHIP was fully implemented, children in families with incomes up to 200 percent of the FPL were eligible for public insurance in nearly every state (Cohen-Ross et al. 2009).

A robust literature has emerged documenting the positive impacts of the expansions on children's coverage, access to care, and health outcomes (for example, LoSasso and Buchmueller 2004; Currie et al. 2008). Less is known, however, about potential spillovers of the CHIP-era expansions on enrollment into other safety net programs serving similar populations. The overarching objective of our research is to help address this research gap.

C. Interaction between Medicaid and SSI

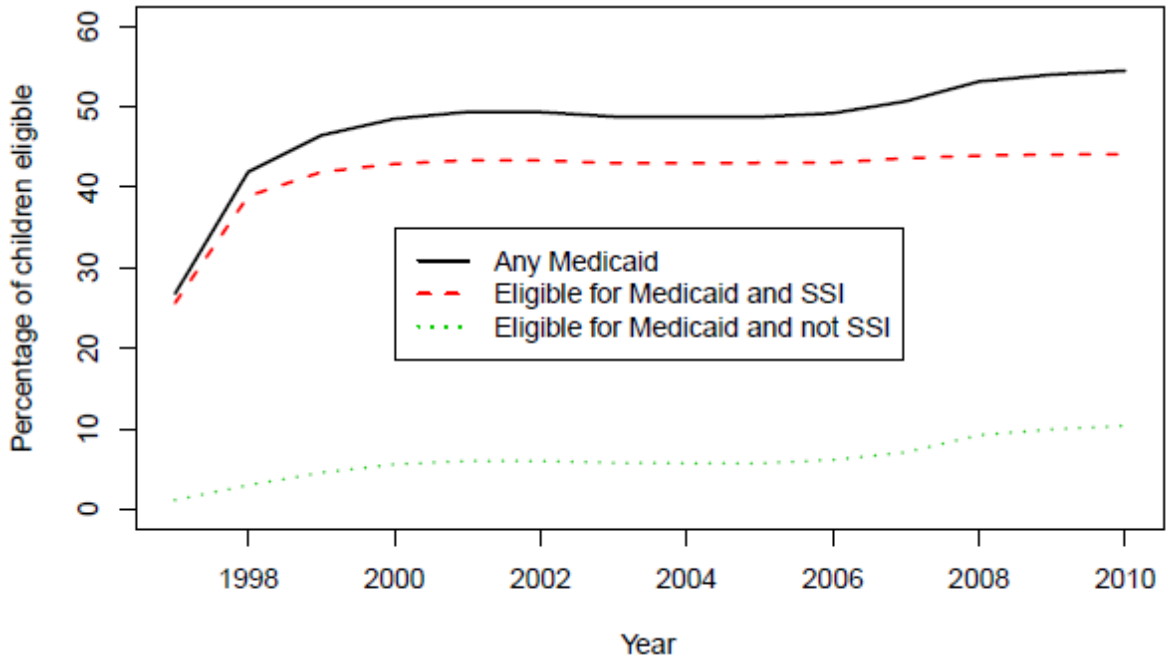
Public insurance expansions can, in theory, be expected to reduce SSI applications if health insurance is a particularly important component of an SSI award. The CHIP-era expansions made more people eligible for Medicaid and made it easier for those eligible to take up Medicaid as a result of simpler administrative processes (Lewit 2014). Many states eliminated or reduced

complicated income disregards and reporting requirements, shortened applications, and increased the time between recertification intervals for public coverage, making it easier for those eligible to qualify for Medicaid. For those who might have been eligible for SSI, Medicaid expansions reduced the relative value of an SSI award. A reduced value of a new award would likely lead people on the margin to no longer apply for benefits.

Substitution between the two programs should occur, though, only if those eligible for Medicaid have low enough incomes to potentially qualify for SSI. SSI primarily serves poor and near-poor families. Excluding the income from SSI payments, about 58 percent of child recipients live in households with incomes under 100 percent of the FPL, and another 19 percent live in households with incomes from 100 to 150 percent of the FPL (Bailey and Hemmeter 2013). Figure II.1 shows the percentage of children estimated to be income-eligible for Medicaid from 1997 to 2010. Eligibility for Medicaid increased substantially, particularly from 1997 to 2002, with almost all children covered by Medicaid also estimated to be income-eligible for SSI. On average, about 42 percent of children were income-eligible for both Medicaid and SSI, whereas about 6 percent of children were income-eligible for Medicaid but not SSI. Those newly eligible for Medicaid with incomes too high for SSI are unlikely to substitute between programs.

Alternatively, increases in public insurance eligibility may have increased children's participation in SSI. The expansions likely brought some families into the social service safety net for the first time, potentially increasing awareness of social programs more broadly, including SSI. Moreover, as posited in a federal report (Government Accountability Office 2012), greater access to medical care facilitated by newly available Medicaid coverage might have led to more opportunities to receive qualifying—and documented—diagnoses, which could particularly increase SSI participation in the longer term.

Figure II.1. Share of children ages 1 to 16 income-eligible for Medicaid and SSI



Source: Authors' calculations using the March Annual Social and Economic Supplement to the Current Population Survey, Medicaid eligibility thresholds, and SSI income deeming rules. These calculations assume households only have earned income.

Despite anecdotal reports that some low-income individuals with disabilities apply for federal disability benefits solely because of the accompanying Medicaid coverage (Joffe-Walt 2013), little empirical research demonstrates how the dramatic increase in eligibility for Medicaid coverage over the past 25 years has affected SSI applications and awards among children. Several recent studies examine the effect of public insurance coverage expansions on application and participation in SSI, although all focus on adults. Taken together, the findings across these studies are decidedly mixed. These papers studied several different changes in Medicaid eligibility, from the Affordable Care Act (Schimmel Hyde et al. 2017; Chatterji and Li 2017; Gouskova 2016) and Massachusetts health insurance expansion (Maestas et al. 2014) to Medicaid expansions for childless adults in the early 2000s (Burns and Dague 2017) and the Oregon randomized Medicaid expansion (Baicker et al. 2014).

The expansions of the Medicaid program to children during the 1980s and 1990s could also have had meaningful long-run impacts on SSI participation. On the one hand, a promising new literature documents that the health benefits associated with eligibility for public health insurance in early childhood emerge over time, yielding large health benefits throughout adolescence and young adulthood (Bourdeaux et al. 2016; Goodman-Bacon 2017; Miller and Wherry 2017; Wherry and Meyer 2016). Better health outcomes could lead to reduced SSI receipt throughout the life course, even in the absence of contemporaneous enrollment impacts. On the other hand, additional interactions with the health care system due to Medicaid coverage could increase the likelihood that doctors diagnose conditions and recommend applying for SSI benefits, leading longer-term SSI participation to increase.

The only existing analysis of the impact of expansions of public coverage in childhood on participation in disability programs during adulthood is by Goodman-Bacon (2017), who used the introduction of the Medicaid program in 1966 to 1970 and data from the 2000 to 2014 U.S. Census and American Community Survey to estimate the long-run impact of the insurance on health, labor market outcomes, and program participation. He found that Medicaid improved adult health outcomes, including improvements in functional capacity, and reduced disability benefit receipt during adulthood.

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III. DATA

We drew data for this study from three main sources. First, we used SSA's Supplemental Security Record, which captures the complete application and award history for any person applying to SSI since 1974. This includes denied applicants, indicating the reason for denial, such as if an application was denied for nonmedical reasons (referred to as technical denials) and thus did not receive a medical evaluation. We obtained annual frequency counts of SSI applications, awards, and technical denials by age, state, and year covering the period 1997[3] through 2015.

Second, we used Medicaid and CHIP eligibility income thresholds for a given age-state-year combination from 1980 through 2010. Income thresholds are expressed as the maximum share of the FPL under which a family could qualify for Medicaid. Brown et al. (2017) put together these income thresholds at the age-state-year level in their analysis of the impacts of total childhood Medicaid exposure on adult labor market earnings and Earned Income Tax Credit payments. These data are publicly available through 2006 from one of the authors,[4] and we updated the thresholds through 2010 using reports from the Kaiser Family Foundation.[5]

Third, we used data from the March supplement of the Current Population Survey (CPS) for two primary purposes. First, we calculated simulated eligibility for Medicaid, consistent with the methods developed by Cutler and Gruber (1996) and Currie and Gruber (1996a, b). Simulated Medicaid eligibility measures the percentage of children who would be eligible for Medicaid

[3] We start with data in 1997 as this is the year that CHIP was created. In addition, SSI applications data before 1997 could still be affected by the post-*Zebley* easing of child SSI standards, as standards did not change until the Personal Responsibility and Work Opportunity Reconciliation Act of 1996.

[4] The thresholds can be downloaded from http://www.econ.yale.edu/~ak669/BKL.Calculator.Appendix.zip.

[5] Reports are available from https://www.kff.org/medicaid/report/annual-updates-on-eligibility-rules-enrollment-and/.

based on the income thresholds for a given age-state-year eligibility regime. Second, we used CPS data to construct various control variables that we incorporated into our regressions, such as the percentage of families in poverty in a given age-year-state.

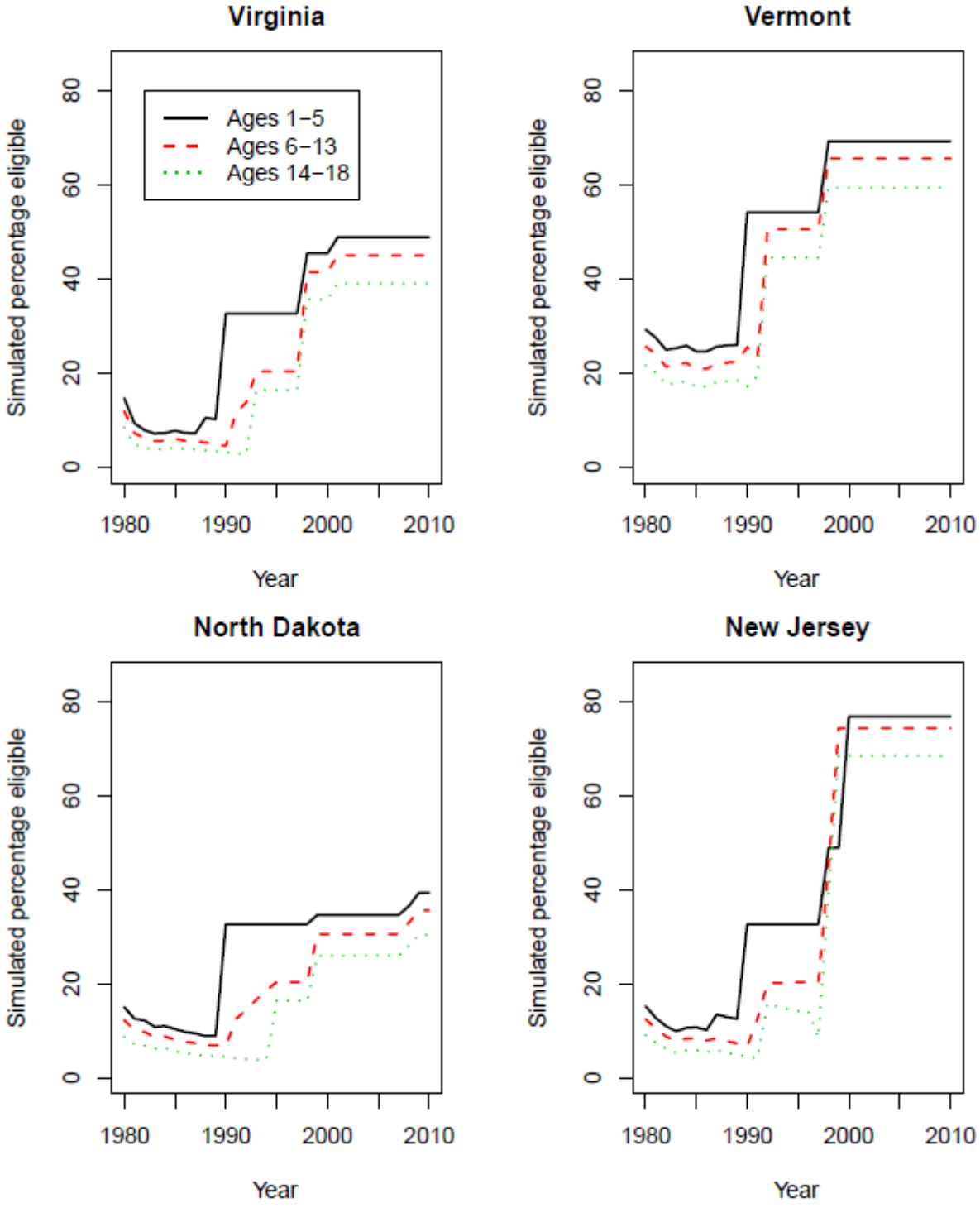
We calculated simulated eligibility via the following steps using all people in the 1996 March CPS. For the full national sample of children who are less than 1 year old, we calculated the percentage who were eligible for Medicaid in each state in 1980 given the income threshold for children who are less than 1 year old. We then repeat the analysis for cohorts of children who are 1 year old, 2 years old, and so on until 18 years old. Next, using the same full national sample of children in the 1996 March CPS who are less than 1 year old, we calculate the percentage eligible for Medicaid in each state in 1981, and repeat this for all children ages 1 through 18 in 1981. We then repeat this process for the years 1982 through 2010. By using a national sample, we isolate variation in state legislative policies, avoiding any potentially endogenous population composition differences that might bias associations between observed eligibility and SSI receipt. By using a constant base year, we avoid confounding changes in eligibility due to rules changes with changes due to the strength of the economy. Figure III.1 demonstrates how simulated eligibility varies over time by age group across four example states.

Using these data, we also calculated the cumulative eligibility from ages 0 to 18 for cohorts born in 1980–1992 for all states by summing the simulated eligibility for the corresponding cohort over their childhood. The long-term analysis uses cumulative eligibility.

Table III.1 presents some basic summary statistics. Averaged across ages 1 through 16, [6] years 1997 through 2010, and all states, approximately 0.53 percent of the child population

[6] All analyses exclude newborn children because low birthweight rules substantially increase application rates. Children aged 17 are also excluded because applications increase in anticipation of the change in SSI eligibility rules at age 18, when disability status is determined according to the adult standard and parental deeming rules no longer apply.

Figure III.1. Estimated yearly eligibility for Medicaid, by age group



Sources: Authors' calculations using CPS data. FPL thresholds come from Brown et al. (2017).

Note: Simulates the percentage of the 1996 national CPS sample that would be eligible for Medicaid coverage by age in each state and year.

Table III.1. Summary statistics for children ages 1 to 16 from 1997 to 2010

	Mean (percentage points)	Standard Deviation
SSI applications per capita	0.53	0.33
SSI awards per capita	0.20	0.11
Simulated share eligible for Medicaid	46.71	12.63
Children in poverty	17.98	8.58
Children in single-parent households	27.29	9.32
Male	51.13	8.15
Black	13.99	15.37
State unemployment rate	5.42	2.00
Population in additional Medicaid criteria state	25.38	--
Observations	11,424	

Note: Table presents the mean across all age-state-year cells (16 age groups, 51 states, and 14 years) for each variable. The first two rows come from SSA's Supplemental Security Record data. Most other rows are estimates from the CPS. The final row expresses the percentage of the population across all age groups in 1997 in states with an additional criteria to qualify for Medicaid.

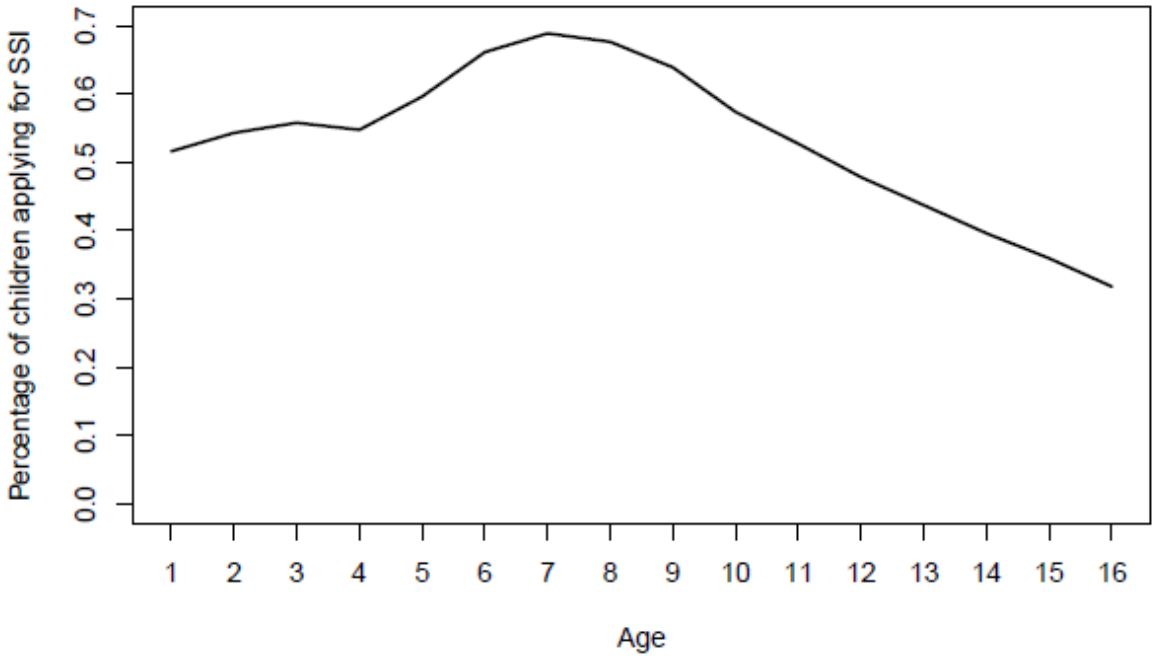
applies for SSI in a given year. This masks substantial heterogeneity in application trends by age. Figure III.2 shows that applications increase nearly linearly until age 7 and then decrease linearly after that. On average, 47 percent of the population is eligible for Medicaid. About one-fourth of the population resides in the 18 states where SSI recipients must satisfy additional criteria to receive Medicaid.

Our contemporaneous analysis focuses on three main outcome measures: SSI applications, SSI awards, and technically denied SSI applications for a given age-state-year cohort. Our long-term analysis focuses on adult SSI applications and awards.[7] The latter outcomes are calculated annually from 1998 to 2015 for a given birth year-state cohort for people born from 1980 to 1987 for when they are at least 18 years old. All outcomes are reported per capita,[8] so that states with higher populations do not mechanically have higher application counts.

[7] We do not report impacts on technical denials in the long-term specification. Because there were many fewer technical denials than applications or awards, we had to pool technical denials across multiple age cohorts in the contemporaneous specification. In the long-term specification, we had only 8 birth-year cohorts, compared with 16 individual age cohorts in the contemporaneous specification. Pooling would therefore lead to very few birth year cohorts, leaving us with little variation in Medicaid eligibility.

[8] Population data are publicly available from the University of Missouri Census Data Center back to 1990: https://census.missouri.edu/population-by-age/.

Figure III.2. Application trends in SSI, by age



Source: Authors' calculations using SSA administrative data.

Among these outcome measures, we hypothesized that changes in Medicaid eligibility most likely affected SSI applications. Filing an application incurs minimal financial cost, though it can incur considerable time cost in navigating administrative requirements. If a family was on the margin of submitting an application but became newly eligible for Medicaid due to an expansion, the value of an SSI award would decline because Medicaid enrollment is now available by other means. The decrease in the value of an SSI award could persuade some families not to apply. We hypothesized that awards were somewhat less likely to be affected for children in households living in poverty because SSI cash benefits for the child are likely to be a relatively important source of income. Exploring technically denied applicants, which are primarily applications denied because income or resources are too high, enables us to determine the primary drivers of changes in applications. Because some states expanded Medicaid to many higher-income families, we might expect technical denials to decline.

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IV. EMPIRICAL STRATEGY

To isolate the plausibly causal effect of Medicaid and CHIP eligibility on SSI applications, we use the simulated eligibility approach first introduced in Currie and Gruber (1996a, b) that remains in frequent use in related studies. Our primary regression specification is as follows:

$$(1)\quad y_{ast} = \alpha + \beta_s + \beta_t + \delta_1 SIM_{ast} + \beta_1 X_{ast} + e_{ast}$$

The outcome, y_{ast}, measures the count of the relevant SSI outcome (for example, applications) per capita for a given age *a*, state *s*, and year *t*.[9] We control for state fixed effects (β_s) and year fixed effects (β_t). We also control for age trends in SSI applications using a linear spline with a knot at age 7, because child SSI applications increase until age 7 and then decrease thereafter (Figure III.2).[10]

The regression also controls for basic variables X_{ast} from the March CPS averaged across a given age-state-year, including simple race and gender demographics, the percentage of households in poverty, the percentage with single-parent households, the percentage receiving Supplemental Nutrition Assistance Program benefits, the percentage with any person receiving SSI benefits, the percentage with any person receiving Temporary Assistance for Needy Families benefits, and the educational breakdown of the primary parent (percentage with no education, less than high school, high school, some college, or college and above). We also include

[9] Our primary specification is unweighted, and includes one observation per age-state-year. Implicitly, estimated effects are for the average state. To obtain effects for the average person, we also run specifications in which we weight observations by the population in that age-state-year cell. The results are qualitatively similar. To preserve space, we do not report these weighted regressions, though results are available upon request.

[10] Our results are sensitive to including this linear spline in age. If we did not control for age patterns, we would spuriously attribute the relatively higher applications at younger ages to the higher level of eligibility at these ages. Because patterns of application change sharply at age 8, we estimated whether the relationship between Medicaid eligibility and SSI participation outcomes differs above and below this threshold, controlling separately for a linear trend in age. We find that the impacts of additional eligibility are relatively similar for those younger and older than 8 (results not reported).

measures of the state-year unemployment rate from the Bureau of Labor Statistics and state-year real gross domestic product per capita from the Bureau of Economic Analysis..

The key explanatory variable is the simulated eligibility measure SIM_{ast}, the probability that an individual is eligible for Medicaid. This variable represents the generosity of Medicaid and CHIP eligibility for each age group in a given state in a given year. Differences across states, years, and age groups in Medicaid income thresholds drive the changes in this variable. Consistent with Cutler and Gruber (1996), Currie and Gruber (1996a, b), and Brown et al. (2017), we interpret variation in eligibility for public coverage as plausibly exogenous, enabling us to estimate the causal impact of changes in Medicaid and CHIP eligibility on SSI outcomes.

The key coefficient of interest is δ_1, which can be interpreted as the impact of a 1 percentage point increase in Medicaid eligibility on the SSI outcome variable (where the simulated eligibility is measured as a percentage). Including state and time fixed effects controls for any state-specific characteristics that are constant over time and any secular trends common to all states, respectively. The source of identifying variation in SSI outcomes is therefore deviations from the general age pattern in SSI outcomes within a given state and year. Standard errors are clustered by state. We report all results using a linear probability model.

As discussed earlier, in most states, receipt of SSI benefits also confers automatic receipt of Medicaid. However, some states require an additional application for Medicaid (despite the fact that one would automatically qualify if receiving SSI benefits) and some states have more stringent income requirements than SSI to qualify for Medicaid so that an SSI recipient might not be eligible for Medicaid. We test for differences in the impact of the Medicaid and CHIP expansions across these two groups of states by reestimating Equation (1) for our main outcome

variables, including an interaction between a binary variable *Additional Criteria*$_s$ and the simulated eligibility variable.

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V. CONTEMPORANEOUS RESULTS

Table V.1 shows the estimated impact of a 1 percentage point increase in the simulated share of a given age-state-year cohort that is eligible for Medicaid on per capita SSI applications, controlling for general age trends in applications. The estimated coefficient in Column (1), which does not include fixed effects, is not significant. Our preferred specification in Column (2), which adds state- and year-fixed effects, indicates no effect of increased Medicaid eligibility on SSI applications. In response to a 10 percentage point increase in the share eligible for Medicaid (a 21 percent increase relative to the mean, Table III.1), SSI applications per capita decrease by .01 percentage points, or a .02 percent decrease relative to the mean. The estimates are fairly precise, as the 95 percent confidence interval rules out an increase or decrease in applications per capita larger than 3 percent from a 21 percent increase in the simulated share eligible. Column (3) includes state-by-year fixed effects. State and year fixed effects are the preferred specification because they do not soak up as much variation as state-by-year fixed effects. However, using state-by-year fixed effects is a preferred robustness check adopted in the literature (Currie and Gruber 1996b), and yields little change in the results.[11]

Table V.1. Impact estimates on SSI applications

	(1)	(2)	(3)
Simulated eligibility	0.0010 [0.0010]	-0.0001 [0.0007]	-0.0003 [0.0008]
Fixed effects	None	State, year	State by year
Observations	11,424	11,424	11,424

Note: Table presents estimates of the effect of a 1 percentage point increase in simulated eligibility on the number of SSI applications per capita, or an estimate of δ_1 from Equation (1). SSI applications per capita are measured at the age-state-year level from 1997 to 2010 for all states and children ages 1 to 16. All specifications include basic controls and a linear spline in age matching the general pattern in the outcome by age. Standard errors are shown in brackets and are clustered by state.

* Indicates significance at the 5 percent level.

[11] A specification including state and year fixed effects—but excluding state-by-year fixed effects—implicitly assumes that various states' SSI outcomes would have moved in parallel absent the CHIP-era expansions. A specification including state-by-year fixed effects relaxes this assumption, instead allowing for differential trends by state.

Although the aggregate results suggest no effect of Medicaid eligibility on SSI applications, there is substantial state heterogeneity in this relationship. We classify states by whether they automatically confer Medicaid after an SSI award.[12] The top panel of Table V.2 repeats the overall impact of simulated eligibility on SSI applications from Columns (2) and (3) of Table V.1; the bottom panel shows the estimates for each group of states. There is a significant, negative relationship in the states that have additional criteria to receive Medicaid, and a small, insignificant relationship in the states that automatically enroll SSI awardees. The magnitude of the impacts in the additional criteria states are large—a 10 percentage point increase in the share eligible leads to an 11 to a 23 percent reduction in SSI applications, whereas the same 10 percentage point increase leads to a 1 to 4 percent increase in SSI applications in states where children automatically qualify for Medicaid after an SSI award.[13]

A plausible explanation of the results concerns the higher transaction costs in states with additional Medicaid criteria of enrolling in Medicaid via obtaining SSI eligibility—on top of the transaction cost of obtaining SSI, which exists in all states. For those considering filing an SSI application primarily motivated by health insurance, the CHIP expansions reduced the transaction costs to gain Medicaid coverage by more in states with an additional criteria. In states without additional criteria, the new Medicaid enrollment option replaced the transaction costs of applying for SSI with the transaction costs of applying for Medicaid, but in states with additional criteria the new option replaced the transaction costs of applying for SSI and subsequently separately applying for Medicaid with transaction costs of applying for Medicaid only. Our finding of a differential

[12] SSI application rates were significantly lower in states with an additional criteria required to qualify for Medicaid, averaging just 0.38 percentage points compared with 0.60 percentage points in automatic qualification states. However, acceptance rates are comparable across the two types of states, indicating that the disability severity of applicants is likely similar.

[13] The percentage of children eligible by age is nearly identical across the two types of states, so a 10 percentage point increase in the share eligible is therefore a similar percentage change in coverage in both types of states.

impact in substitution away from SSI application into Medicaid coverage in states with additional criteria to qualify for Medicaid is therefore consistent with health insurance motivating some SSI applications.

Table V.2. Impact estimates overall and by state for SSI outcomes

	Applications		Awards		Technical denials	
	(1)	(2)	(3)	(4)	(5)	(6)
Overall						
Simulated eligibility	-0.0001 [0.0007]	-0.0003 [0.0008]	0.0001 [0.0003]	-0.0006* [0.0003]	0.0001 [0.0001]	0.0000 [0.0000]
State heterogeneity						
Automatic Medicaid award with SSI qualification states	0.0008 [0.0009]	0.0023 [0.0015]	0.0004 [0.0003]	-0.0003 [0.0003]	0.0002^ [0.0001]	0.0000 [0.0001]
Additional criteria to get Medicaid after SSI qualification states	-0.0041* [0.0013]	-0.0087* [0.0031]	-0.0010* [0.0004]	-0.0019* [0.0007]	-0.0003^ [0.0002]	-0.0001 [0.0002]
Fixed effects	State, year	State by year	State, year	State by year	State, year	State by year
Observations	11,424	11,424	11,411	11,411	4,220	4,220

Note: Table presents estimates of the effect of a 1 percentage point increase in simulated eligibility on the column's outcome per capita, or an estimate of δ_1 from Equation (1). SSI applications and awards per capita are measured at the age-state-year level from 1997 to 2010 for all states and children ages 1 to 16. Technical denials are measured at the age cohort-state-year level from 1997 to 2010 for all states and children in age groups 1 or 2, 3–5, 6–8, 9–11, 12–14, and 15 or 16. All specifications include basic controls and a linear spline in age matching the general pattern in the outcome by age. Standard errors are shown in brackets and are clustered by state.

*/^ Indicates significance at the 5/10 percent level, respectively.

This is an example of transaction disutility—negative features of a transaction that can discourage an individual from undertaking the transaction even if, in the absence of those features, the individual would choose to do so (Thaler 1983). In this case, the Medicaid expansion reduces the transactional disutility of enrolling in Medicaid by more in the additional criteria states than in the automatic eligibility states. That might lead to a differential reduction in applications in such states.

The rest of Table V.2 shows both the overall and state heterogeneity impacts of increased Medicaid eligibility on SSI awards and technical denials. We precisely estimate no overall effect

of Medicaid eligibility on awards. However, similar to the findings on applications, this average effect masks heterogeneity by state; we find a large statistically significant reduction in SSI awards resulting from increases in Medicaid eligibility in additional criteria states. Medicaid eligibility has a similar small, insignificant overall effect on technical denials, with significant reductions in technical denials in additional criteria states. Results across all outcomes are generally similar whether using state and year fixed effects or state-by-year fixed effects.

Taken together, these findings imply that the people in additional criteria states who substitute away from SSI and instead rely on Medicaid eligibility for health insurance coverage include some who are eligible for SSI benefits. The relative size of the decrease in applications from a 10 percentage point increase in the share eligible (11 percent) is of slightly larger magnitude than the comparable reduction in awards (7 percent), meaning that a disproportionate share of those induced not to apply for SSI would have been found ineligible had they applied.

Robustness checks

We implement several checks to demonstrate the robustness of our results. First, we show that increases in the share eligible for both Medicaid and SSI drove reductions in applications, awards, and technical denials found in additional criteria states, with no impact for increases in the share eligible for Medicaid but not SSI. As described in Section II, we expect to find that any changes in application behavior due to expansions in Medicaid should occur only where the expansions in Medicaid affected those who might also be eligible for SSI. For example, expansions to an income threshold of 400 percent of the FPL should have no additional impact on SSI applications relative to an expansion to 250 percent of the FPL because those with income above 250 percent of the FPL have incomes that are too high to qualify for SSI (Appendix A, Table A.1).

In Table V.3, we modify Equation (1) by dividing the simulated Medicaid eligibility measure into two categories: the share eligible for both Medicaid and SSI and the share eligible for

Table V.3. Impact estimates by overlapping Medicaid and SSI income eligibility

	Applications		Awards		Technical denials	
	(1)	(2)	(3)	(4)	(5)	(6)
Overall						
Share eligible for both Medicaid and SSI	0.0000 [0.0012]	0.0003 [0.0008]	-0.0001 [0.0005]	-0.0007^ [0.0003]	0.0000 [0.0002]	0.0002* [0.0001]
Share eligible for Medicaid only	-0.0002 [0.0009]	-0.0021 [0.0013]	0.0004 [0.0004]	-0.0006 [0.0006]	0.0002 [0.0002]	-0.0005 [0.0003]
State heterogeneity						
Automatic Medicaid award with SSI qualification states						
Share eligible for both Medicaid and SSI	0.0016 [0.0014]	0.0032* [0.0014]	0.0002 [0.0005]	-0.0002 [0.0004]	0.0001 [0.0002]	0.0002* [0.0001]
Share eligible for Medicaid only	-0.0002 [0.0011]	-0.0001 [0.0020]	0.0005 [0.0004]	-0.0002 [0.0008]	0.0004 [0.0003]	-0.0004 [0.0003]
Additional criteria to get Medicaid after SSI qualification states						
Share eligible for both Medicaid and SSI	-0.0053* [0.0020]	-0.0079* [0.0031]	-0.0013* [0.0005]	-0.0019* [0.0007]	-0.0003^ [0.0002]	0.0001 [0.0002]
Share eligible for Medicaid only	-0.0009 [0.0015]	-0.0141^ [0.0073]	-0.0005 [0.0007]	-0.0035 [0.0023]	-0.0004 [0.0003]	-0.0016* [0.0008]
Fixed effects	State, year	State by year	State, year	State by year	State, year	State by year
Observations	11,424	11,424	11,411	11,411	4,220	4,220

Note: Table presents estimates of the effect of a 1 percentage point increase in simulated eligibility for both Medicaid and SSI and simulated eligibility for Medicaid and no SSI on the column's outcome per capita. SSI applications and awards per capita are measured at the age-state-year level from 1997 to 2010 for all states and children ages 1 to 16. Technical denials are measured at the age cohort-state-year level from 1997 to 2010 for all states and children in age groups 1 or 2, 3–5, 6–8, 9–11, 12–14, and 15 or 16. All specifications include basic controls and a linear spline in age matching the general pattern in the outcome by age. Standard errors are shown in brackets and are clustered by state.

*/^ Indicates significance at the 5/10 percent level, respectively.

Medicaid only, based on the thresholds for families with only earned income. In state heterogeneity specifications, we also include the interaction between each of these separate simulated eligibility measures with an indicator for additional criteria states. In results using state and year fixed effects (our preferred specification; shown in the first, third, and fifth columns), increases in the share eligible for Medicaid and SSI lead to reductions in applications, awards, and technical denials in additional criteria states, whereas increases in the share eligible for Medicaid only have no effect. Our primary result of a reduction in additional criteria states is thus driven

only by changes in eligibility at income levels at which changes in Medicaid eligibility could plausibly lead to substitution away from SSI. This finding reinforces the interpretation of the impact of the Medicaid expansion as the causal effect on SSI outcomes.

As a placebo test, we confirmed that there is no effect of child eligibility on old age SSI outcomes. People older than 65 can qualify for SSI, with eligibility determined entirely by income rather than any disability status. There should be no relationship between states' CHIP expansions, targeted to children, and SSI outcomes for people ages 65 and older. We reestimate Equation (1) using applications at age $a + 65$ rather than age a as the outcome variable. Table V.4 shows there is no significant relationship between simulated eligibility for children and the corresponding old age SSI applications and awards in the specifications with state and year fixed effects.[14] Importantly, the results for old age applications indicate no pattern across states. Hence, it seems unlikely that general factors driving SSI applications drive the main finding for children in additional criteria states.[15]

[14] We do not include technical denials in these old age robustness checks because there is no disability decision made in old age applications, suggesting that all denials are technical denials.

[15] There are no Medicaid eligibility changes for the elderly. Because there are changes to Medicaid eligibility during this period for working-age adults, such as expansions to childless adults in some states, we do not conduct a comparable placebo test for working-age adults.

Table V.4. Impact estimates overall and by state for old age SSI outcomes (robustness)

	Applications		Awards	
	(1)	(2)	(3)	(4)
Overall				
Simulated eligibility	0.0005 [0.0009]	-0.0040* [0.0008]	0.0007 [0.0004]	0.0004 [0.0005]
State heterogeneity				
Automatic Medicaid award with SSI qualification states	0.0010 [0.0010]	-0.0026* [0.0010]	0.0010* [0.0005]	0.0014^ [0.0008]
Additional criteria to get Medicaid after SSI qualification states	-0.0014 [0.0018]	-0.0086* [0.0031]	-0.0006 [0.0008]	-0.0029^ [0.0016]
Fixed effects	State, year	State by year	State, year	State by year
Observations	11,243	11,243	11,123	11,123

Note: Table presents estimates of the effect of a 1 percentage point increase in simulated eligibility on the column's outcome per capita, or an estimate of δ_1 from Equation (1). SSI applications and awards per capita are measured at the age-state-year level from 1997 to 2010 for all states and individuals ages 66 to 81. All other independent variables are exactly as specified in the primary estimates using the corresponding age group that is exactly 65 years younger. All specifications include basic controls and a linear spline in age matching the general pattern in the child outcome by age. Standard errors are shown in brackets and are clustered by state.

*/^ Indicates significance at the 5/10 percent level, respectively.

In Table V.5 we demonstrate the sensitivity of our results to various alternate specification checks, focusing on results from models in which we interact the simulated eligibility with the additional criteria state indicator. First, we varied the regression specification in several ways to exploit the source of variation in Medicaid eligibility. Column (2) shows the estimate from a specification with state and age fixed effects, allowing variation at the year level and controlling for a linear time trend as applications to child SSI increased linearly over time. The results are similar to our preferred specification, with a significant, negative impact of increased Medicaid eligibility on SSI applications in additional criteria states. We also estimated the same specification with age and year fixed effects, allowing variation at the state level and including dummies at the regional level covering SSA's 10 administrative regions to control for broader geographic trends in outcomes. Column (3) shows a significant negative impact on SSI applications in both types of

states. However, we cannot rule out that broader differences across states leading to substantial state heterogeneity in SSI participation, such as changes in state supplemental payments, drive these results. Though we controlled for region, estimates from this specification are almost certainly biased to some degree due to unobserved local variables that influence both Medicaid eligibility and SSI applications. Results for SSI awards are generally less robust. We find a significant positive effect on awards in automatic qualification states and no effect in additional criteria states when using age and state fixed effects, though the model with age and year fixed effects matches our main specification. The noisiness of these results suggests that the findings for awards should be taken with caution.

Table V.5. Impact estimates with varying specifications and robustness checks

	Baseline specification	State and age fixed effects	Age and year fixed effects	Varied base year
	(1)	(2)	(3)	(4)
Applications				
Automatic Medicaid award with SSI qualification states	0.0008 [0.0009]	0.0009 [0.0008]	-0.0011* [0.0003]	0.0008 [0.0009]
Additional criteria to get Medicaid after SSI qualification states	-0.0041* [0.0013]	-0.0039* [0.0013]	-0.0044* [0.0004]	-0.0041* [0.0013]
Awards				
Automatic Medicaid award with SSI qualification states	0.0004 [0.0003]	0.0010* [0.0003]	0.0000 [0.0001]	0.0005 [0.0003]
Additional criteria to get Medicaid after SSI qualification states	-0.0010* [0.0004]	-0.0002 [0.0004]	-0.0015* [0.0001]	-0.0009* [0.0004]

Note: Table presents estimates of the effect of a 1 percentage point increase in simulated eligibility on the column's outcome per capita using a variety of specifications. SSI applications and awards per capita are measured at the age-state-year level from 1997 to 2010 for all states and children ages 1 to 16. The first column mimics the specification in Table V.2 Column (1) for applications and Table V.2 Column (3) for awards. The second column includes state and age fixed effects, rather than state and year fixed effects, controlling for a linear trend in years because applications generally increase linearly from 1997 to 2010. The third column includes age and year fixed effects, controlling for differences between regions of states using 10 dummies for each SSA administrative region. The fourth column uses a similar regression specification as the first column, but calculates the share eligible using each year of the CPS from 1996 to 2010 as the base sample, and then averages across all such specifications. Standard errors are shown in brackets and are clustered by state, except in the third column where they are clustered by year.

*/^ Indicates significance at the 5/10 percent level, respectively.

Second, we vary how we calculate the simulated eligibility measure. The primary specification uses a fixed national cohort from the 1996 CPS to calculate the percentage eligible by age, state, and year. The fixed cohort ensures that simulated eligibility varies only due to changes in state policies over time, rather than from changes in broader macroeconomic conditions or decisions on where to locate. As a robustness check, we separately simulate eligibility using each year of the CPS from 1996 to 2010 to produce separate estimates for the impacts of the share eligible on SSI outcomes, and then take the mean across all specifications. The final column of Table V.5 shows that using 1996 as the base year was not important, as results for both applications and awards averaging across all separate estimates of the share eligible measure nearly mirror the preferred specification in Column (1).[16]

[16] We also estimate results focusing only on the period from 1997 to 2002 when the main eligibility expansions through CHIP occurred, which does not affect the results (not shown). In addition, we estimated regressions taking the log of the outcome variables to control for outliers, which also does not affect the results (not shown); we prefer the unlogged specification because the outcome variable has already been scaled by the population to account for any potential outliers.

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VI. LONG-TERM ANALYSIS

We also assess the impact of exposure to public insurance coverage as a child on adult SSI applications and awards. To do so, we use a cohort approach modeled after recent work by Miller and Wherry (2017) and Bodreaux et al. (2016); both studies examined the effects of parental and child Medicaid expansions on adult health outcomes. This approach leverages variation in cumulative childhood exposure to Medicaid and CHIP eligibility due to differences in the timing and magnitude of states' Medicaid and CHIP expansions. Because we track Medicaid eligibility for cohorts by birth year going back to 1980, variation in the cumulative childhood exposure to Medicaid is driven not only by changes as part of the CHIP-era expansions, but also by expansions during the 1980s and 1990s that expanded Medicaid to low-income pregnant women and children outside of the welfare system.

A. Regression specification

Our primary regression specification is as follows:

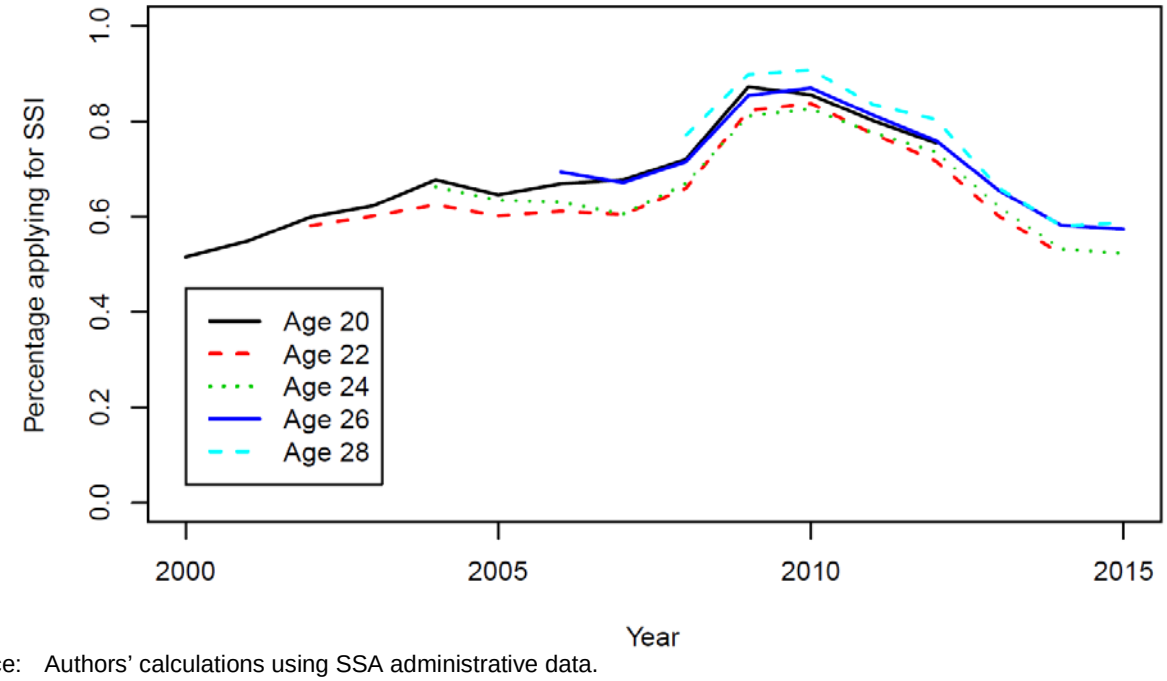
(2) $y_{bst} = \alpha + \beta_{st} + \gamma_b + \gamma_s b + \delta_1 SIM_{bs} + \beta_1 X_{bs} + e_{bsa}$

The regression specification is fairly similar to the contemporaneous analysis regression (Equation [1]) in that it regresses an SSI outcome on a simulated share eligible, but it differs in several crucial ways. First, the contemporaneous analysis measures outcomes at the age-state-year level, but the long-term analysis measures outcomes annually at the birth year-state level (outcomes *y* observed in year *t* for a cohort born in a given birth year *b* in a given state *s*). This eligibility measure varies only at the birth year-state level, and is thus constant for a particular cohort across all years of outcomes. Second, the simulated share eligible indicates the number of years in childhood that people born in a given state and year were expected to be eligible for

Medicaid, calculated by summing the probability of qualifying for Medicaid at each age of childhood (the contemporaneous measure).

For each outcome, we pool observations across years for the birth year and state cohorts in the sample, controlling for the year of observation with state-by-year fixed effects (β_{sy}). We also run specifications including separate state and year fixed effects. Each specification controls for trends in applications over time; as shown in Figure VI.1, applications exhibit a clear countercyclical pattern, increasing during the Great Recession and decreasing thereafter. We include birth year fixed effects (γ_b) to account for any differences in outcomes by birth year, such as differences in age at the start of the Great Recession. We also include state-specific linear trends ($\gamma_s b$) to allow for general linear patterns in outcome variables across birth cohorts within each state.

Figure VI.1. Adult application trends in SSI over time, by age



Source: Authors' calculations using SSA administrative data.

Note: Shows the percentage of people at a given age that apply in a given year. In the analysis, we group by birth year cohort. As an example, the 1980 birth year cohort was 20 in 2000, 22 in 2002, 24 in 2004, and so on.

The sample used to estimate Equation (2) consists of cohorts born from 1980 to 1987, for whom we observe outcomes from age 20 through age 28 for all cohorts (as SSI data go through 2015). This preserves a balanced panel, ensuring that each birth year cohort has an equal number of observations in the regression.

The key coefficient of interest is δ_1, which can be interpreted as the impact of a one–year increase in Medicaid eligibility during childhood on the SSI outcome variable. We also control in the regression for demographic characteristics and overall education in the state in a cohort's year of birth. We include fewer control variables in the long-term regressions than the contemporaneous analysis because the CPS provides less detailed information going back to 1980. All variables are calculated across the complete population in the state in a given year. The complete list of control variables includes the percentage of the population that is black; the percentage that is another non-white race; the percentage that is married; the percentage with less than a high school education, the percentage who have completed high school; the percentage ages 0 to 4, 5 to 17, 18 to 24, 25 to 44, 45 to 64, and 65 and older; the unemployment rate; and real gross domestic product.

The identification assumption for the long-term analysis is therefore similar to the identification assumption in the contemporaneous analysis. Policy differences in relative eligibility throughout childhood and timing of expansions are the sole drivers of changes in simulated eligibility. We assume that increases in eligibility are random after controlling for state fixed effects. This assumption is consistent with the literature. However, one drawback is that this strategy essentially assumes that people do not move across states; it assigns the years of eligibility during childhood to the state where applications are filed. To the extent that moving is random and uncorrelated with relative eligibility for Medicaid, this introduces measurement

error, which attenuates the results. If moving is not random, it might impart some bias to our results.

B. Results

Table VI.1 presents the main results of the long-term analysis and is the analog to Table V.2 for the contemporaneous analysis in showing the impacts of additional eligibility for Medicaid on applications and awards. The coefficient on simulated eligibility of -0.0190 in Column (2) means that a one-year increase in Medicaid eligibility (or a 23 percent increase relative to the mean) during the course of childhood reduces applications to SSI by -0.0190 percentage points (or a 3 percent decrease relative to the mean). Results are generally similar using either the state and year or state-by-year fixed effects specifications, though these results are significant only for the state-by-year fixed effects. Though the results are significant, they are relatively small in magnitude, as we can rule out decreases of greater than 5 percent in either specification. A significant reduction in applications in states where SSI recipients automatically qualify for Medicaid primarily drove the significant decrease, though there is not a significant difference between the two types of states.

Although the earlier results found that Medicaid exposure in childhood did not affect childhood participation in SSI overall, these results indicate that the increased childhood exposure reduced adult applications to SSI. This means that changes in SSI receipt during childhood are likely not the primary driver of the long-term decrease in SSI applications from Medicaid exposure in youth. Rather, it is possible that increased Medicaid exposure during childhood improves health and economic outcomes for children at risk of SSI entry as young adults, leading to reduced SSI applications later. Such a result would be consistent with findings from Miller and Wherry (2017), who found improved health, educational, and economic outcomes for children with increased Medicaid exposure in childhood.

Table VI.1. Long-term impact estimates overall and by state for adult SSI outcomes

	Applications		Awards	
	(1)	(2)	(3)	(4)
Overall				
Simulated eligibility	-0.0119 [0.0119]	-0.0190* [0.0082]	0.0001 [0.0041]	-0.0037 [0.0033]
State heterogeneity				
Automatic Medicaid award with SSI qualification states	-0.0140 [0.0120]	-0.0237* [0.0084]	-0.0006 [0.0042]	-0.0046 [0.0034]
Additional criteria to get Medicaid after SSI qualification states	-0.0064 [0.0207]	-0.0068 [0.0193]	0.0017 [0.0068]	-0.0013 [0.0060]
Fixed effects	State, year	State by year	State, year	State by year
Observations	3,672	3,672	3,671	3,671

Note: Table presents estimates of the effect of a one-year increase in simulated eligibility during childhood on the column's outcome per capita, or an estimate of δ_1 from Equation (2). SSI applications and awards per capita are measured at the birth year-state-year level for cohorts born from 1980 to 1987 for adults ages 20 to 28 (covering years 2000 to 2015) for all states. All specifications include basic controls, state-specific linear trends, and a linear spline in year matching the general pattern in the outcome over time. Standard errors are shown in brackets and are clustered by state.

*/^ Indicates significance at the 5/10 percent level, respectively.

Results for SSI awards are generally insignificant; they are of a similar magnitude to the effects on SSI applications, but have low precision. The results in Columns (3) and (4) indicate that we cannot rule out increases or decreases in SSI awards of less than 5 percent relative to the mean award rate, with the preferred point estimate in Column (4) indicating a 1.8 percent decrease in awards due to a 23 percent increase in eligibility during childhood.

The largest increases in Medicaid eligibility as a result of the most recent (post-1990) expansions were for older children. Before the CHIP expansions, income thresholds for teenagers to qualify for Medicaid were very low. The teenage years could also be particularly important to long-term applications because interactions with SSI during the years closest to becoming an adult might be especially correlated with adult SSI behavior simply given the proximity to adulthood. To allow for nonlinearities in the impacts by age group of exposure to Medicaid eligibility, we estimate the impacts of eligibility over various ages on SSI applications

and awards, rather than cumulative eligibility over the entire childhood. Table VI.2 shows the results of this analysis. Increased eligibility at older ages drove the significant negative impact we find in Column (2) of Table VI.1. The corresponding relationship in Column (2) of Table VI.2 is nearly monotonic, with one year of eligibility at each successive older age leading to generally larger negative impacts on SSI applications. This result is sensitive to the regression specification chosen, however, so should be considered cautiously.

Table VI.2. Long-term impact estimates with differing years of eligibility

	Applications		Awards	
	(1)	(2)	(3)	(4)
Years of eligibility at				
Less than age 1	-0.0804 [0.0691]	0.0096 [0.0434]	-0.0498* [0.0233]	-0.0326^ [0.0180]
Age 1–4	0.0062 [0.0293]	0.0027 [0.0217]	0.0010 [0.0077]	0.0004 [0.0058]
Age 5–9	-0.0159 [0.0196]	-0.0194 [0.0152]	-0.0026 [0.0080]	-0.0058 [0.0066]
Age 10–14	-0.0105 [0.0141]	-0.0189^ [0.0105]	0.0004 [0.0050]	-0.0039 [0.0045]
Age 15–18	-0.0194 [0.0192]	-0.0340* [0.0134]	0.0029 [0.0061]	-0.0033 [0.0042]
Fixed effects	State, year	State by year	State, year	State by year
Observations	3,672	3,672	3,671	3,671

Note: Table presents estimates of the effect of a 1 year increase in simulated eligibility during the range of years indicated in the row on the column's outcome per capita, or an estimate of δ_1 from Equation (2) with multiple measures of simulated eligibility. SSI applications and awards per capita are measured at the birth year-state-year level for cohorts born from 1980 to 1987 for adults ages 20 to 28 (covering years 2000 to 2015) for all states. All specifications include basic controls, state-specific linear trends, and a linear spline in year matching the general pattern in the outcome over time. Standard errors are shown in brackets and are clustered by state.

*/^ Indicates significance at the 5/10 percent level, respectively.

Though the results are somewhat mixed, a decrease in long-term SSI applications from increased Medicaid eligibility, particularly at older ages, rules out complementarity between government benefits programs. Such an effect might occur if participation in one government benefits program, and the accompanying deeper understanding of the social safety net landscape, led to increased participation in other similar programs. Those who become eligible only in the

teenage years might be the ones most likely to understand the complexities of eligibility, so if the programs were complementary, positive impacts would be most likely for eligibility expansions in the teenage years. We find the opposite.

C. Robustness checks

We implement two main robustness checks that are similar to the contemporaneous specifications. First, we vary the base year used to calculate the simulated eligibility. This produces no change in the results (not pictured). Second, we use old age applications as a placebo test. We estimate the exact same regressions, but use an outcome for the birth cohort that is exactly 47 years older. We use this birth cohort so that rather than estimate the effect on applications as children reach adulthood at age 18, we estimate the effect on applications as adults reach old age eligibility at age 65. Table VI.3 shows that there is no significant relationship between the falsified measure of eligibility during a different birth cohort's childhood years and the old age applications and awards from ages 67 to 75.

Table VI.3. Long-term impact estimates overall and by state for old age SSI outcomes (robustness)

	Applications		Awards	
	(1)	(2)	(3)	(4)
Overall				
Simulated eligibility	0.0074 [0.0149]	-0.0065 [0.0111]	-0.0097 [0.0099]	-0.0112 [0.0101]
State heterogeneity				
Automatic Medicaid award with SSI qualification states	0.0006 [0.0152]	-0.0095 [0.0120]	-0.0063 [0.0094]	-0.0080 [0.0099]
Additional criteria to get Medicaid after SSI qualification states	0.0250 [0.0173]	0.0011 [0.0158]	-0.0187* 0.0074	-0.0194* [0.0071]
Fixed effects	State, year	State by year	State, year	State by year
Observations	3,657	3,657	3,624	3,624

Note: Table presents estimates of the effect of a one-year increase in simulated eligibility during childhood on the column's outcome per capita, or an estimate of δ_1 from Equation (2). SSI applications and awards per capita are measured at the birth year-state-year level for cohorts born from 1933 to 1940 for adults ages 67 to 75 (covering years 2000 to 2015) for all states. All other independent variables are exactly as specified in the primary long-term estimates using the corresponding birth cohort that is born exactly 47 years later. All specifications include basic controls, state-specific linear trends, and a linear spline in year matching the general pattern in the outcome over time. Standard errors are shown in brackets and are clustered by state.

*/^ Indicates significance at the 5/10 percent level, respectively.

VII. CONCLUSION

We find no overall impact of increases in Medicaid eligibility on applications and awards to SSI, though there is a significant negative reduction in states where there was an additional criteria for SSI recipients to receive Medicaid. Substitution away from SSI when children were able to obtain Medicaid coverage elsewhere in states with higher transaction costs for Medicaid enrollment is consistent with health insurance playing an important role in the application decision. Our results are generally consistent with the literature on the relationship between health insurance coverage expansions and adult applications to disability benefit programs. Several studies have also found small results overall, with substantial state heterogeneity in the relationship (Schimmel Hyde et al. 2017; Chatterji and Li 2017).

We also find that increased Medicaid eligibility during childhood, particularly in the teenage years, reduces applications for SSI as young adults. Increased Medicaid exposure during childhood can improve health and economic outcomes, leading to reduced eligibility and applications to SSI. This also rules out complementarity between the two programs, whereby Medicaid beneficiaries learn about and eventually apply for SSI through their Medicaid coverage, either by further understanding the social safety net landscape or by recommendations to apply from health professionals.

There could be significant fiscal cost savings from children who would be accepted to SSI but choose not to apply when there is another way for them to obtain Medicaid. In most states with additional criteria to receive Medicaid, the additional criteria is simply filing an application that will be accepted with certainty. Therefore, most new SSI awardees would end up receiving health insurance coverage through Medicaid anyway. Expanding Medicaid therefore reduced

expenditures on SSI benefit payments in these select states. This implies that expanding Medicaid could induce cost savings in federal benefit programs.

These results are therefore important to consider when determining the appropriate level of public health insurance coverage. Despite the recent extension of the CHIP program, questions about the future of Medicaid and CHIP programs remain. Congress recently considered substantial cuts to Medicaid as part of efforts to repeal the ACA, and considered plans to change the financing structure of Medicaid, moving to a block grant model like CHIP. Such changes could result in eligibility rollbacks and funding shortfalls, jeopardizing coverage for low-income families. If proposals to reduce Medicaid eligibility or funding go into effect, some of the cost savings associated with the cuts could be lost due to increases in SSI program participation in states where the two programs appear to be substitutes. The effects might accumulate over the course of many years if they influence long-term participation. Similarly, any expansion in Medicaid might not be as costly to the federal government as initially expected because it might be accompanied by reductions in SSI participation. As such, understanding the potential spillover effects on childhood SSI receipt is an important input for the full accounting of potential benefits and costs of Medicaid and CHIP eligibility.

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APPENDIX A

MAXIMUM INCOME TO RECEIVE SSI BENEFITS

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Table A.1. Maximum income to receive SSI benefits (percentage of FPL)

Number of children	Only earned income		Only unearned income	
	One parent	Two parents	One parent	Two parents
1	222	235	109	116
2	212	205	116	110
3	186	190	110	109
4	177	183	111	111
5	173	176	113	112
6	170	171	116	113
7	161	149	114	101

Source: Authors' calculations using SSA federal benefit rate and parental deeming rules.

Note: Reports the income threshold at which a child's SSI payment would be exactly $0 as a percentage of the federal poverty level. The federal poverty level is calculated using the U.S. Census federal poverty thresholds by size of family and number of children. Calculations assume that there is no unearned income and that there is one eligible child in the household. The precise numbers are reported using the 2016 federal benefit rate of $733 for a single person and $1,100 for a couple; however, numbers are nearly identical if using other years.

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