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Effects of Affordable Care Act (ACA) Marketplace Plans on Disability Claiming

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Abstract

Health insurance marketplaces, a.k.a. “exchanges”, were established through the Affordable Care Act (ACA) to facilitate individual access to affordable health insurance following the implementation of the individual mandate. People with qualifying disabilities can alternatively obtain health insurance through Supplemental Security Income (SSI) and SSI for children programs. This study examines the relationship between the pricing of the ACA marketplace plans and disability claiming. Specifically, I focus on the effect of state-level and Geographic Rating Area (GRA)-level changes in the prices of health plan for a 30-year-old with two children on the number of SSI and SSI child applications per 10, 000 individuals at the state level and GRA level using a linear fixed-effect model. I find no statistically significant effect of the changes in the prices of a 30-year-old-with-two-children health plan on the number of disability applications per 10, 000 individuals at the state level and GRA level from the primary analyses. However, I find evidence that certain subgroup populations are less likely to apply for SSI programs if the premium of a 30-year-old-with-two-children health plan increases, such as populations living in states or GRAs with higher unemployment rates, poverty ratios, and high school graduation rates, as well as individuals living in states where a higher percentage report work limitations. I also find evidence that specific subgroup populations apply to SSI programs if the cost of the premium of a 30-year-old-with-two-children health plan increases, such as populations living in GRAs where there is a higher percentage of non-Hispanic white, reporting difficulties, and work limitations.

Keywords: Affordable Care Act, Health Insurance, Disability Policy, Supplemental Security Income

JEL Classification Codes: I13, I18, H55

1. Introduction

Among many other disability-claiming programs, the Supplemental Security Income (SSI) program provides health insurance benefits for children and adults with low income and work-limiting disabilities in the United States. The SSI program also offers financial support for low-income, aged, blind, or disabled individuals. 5.7 million out of 69.1 million people received Social Security benefits in 2019[1], which increased to 7.9 million people in January 2020, totaling $56.2 billion per year in federal cash payments (Social Security Administration 2020). Another source of health insurance is health insurance marketplaces, also known as "exchanges," which were established through the Patient Protection and Affordable Care Act (ACA)[2] as health plan platforms to provide an affordable and stable source for an individual to buy health insurance through different premium plans. People with an income threshold at or below 138% (recently changed for a few states to 200%) of the federal poverty line (FPL) receive health insurance coverage under the universal health coverage of the ACA Medicaid expansion[3]. This paper aims to study whether receiving health insurance through ACA marketplace plans affects SSI participation.

Understanding the connection between the price of health plans that individuals can obtain through exchanges and SSI and SSI child with disability program participation is essential because SSI beneficiaries can buy health insurance through ACA marketplace plans at low costs. And if health plan prices increase and it seems not affordable to buy health insurance plans through exchanges, SSI beneficiaries can shift to the SSI programs to get their health insurance. A person's decision to participate in SSI programs or similar kinds of mean-tested or transfer programs may be influenced by the changes in the characteristics of the disability or those programs themselves (Moffitt 1992). If the current and upcoming SSI participants are not interested in participating in SSI programs because of the accessibility of the outside and low-cost health insurance benefits, the outcomes could be reduction of the costs for the programs and the overall benefits in social welfare.

[1] Fast Facts and Figures about Social Security 2020.
https://www.ssa.gov/policy/docs/chartbooks/fast_facts/2020/fast_facts20.html

[2] The ACA was originated in order to boost the access to health care for all uninsured Americans regardless of their health and disability status, pre-existing conditions. It was enacted in 2010 and most of the mandates were implemented in 2014 except for the ACA dependent coverage mandate.

[3] https://www.medicaid.gov/medicaid/national-medicaid-chip-program-information/medicaid-childrens-health-insurance-program-basic-health-program-eligibility-levels/index.html

Suppose the cost of premiums for health plans through ACA health insurance marketplaces increases. In that case, people with low incomes and disabilities could intend to obtain health insurance through SSI programs, which would increase the programs' participation. Alternatively, SSI participation might decrease if the cost of premiums is affordable for low-income and disabled individuals through the marketplaces, and the ACA would help to improve access to healthcare and create a disincentive to participate in the SSI programs for those individuals. A few empirical studies support that SSI participation and health insurance are net substitutes as SSI participation may increase due to the determination of disability necessary to get Medicaid (Baicker et al. 2014; Maestas et al. 2014). In this study, I contribute to the literature by understanding and finding the substitution effects among the SSI program's participation and the health insurance premiums of health plans through ACA health insurance marketplaces.

The paper uses both publicly available and administrative data to determine whether receiving health insurance through ACA marketplace plans increases SSI participation. Mainly, I examine whether if the cost of health plan premiums for one individual age 30 and two children increases, the applications of SSI and SSI child with disabilities programs will increase. The publicly available data includes the State Agency Monthly Workload Data (SAMWD), HIX (Health Insurance Exchange Comparison) compare data, Kaiser Family Foundation (KFF), the University of Kentucky Center for Poverty Research (UKCPR), and the Current Population Survey (CPS) from the Integrated Public Use Microdata Series (IPUMS) -CPS. The administrative data is created for me and shared with me by the Social Security Administration (SSA). The publicly available and administrative data from SAMWD and SSA are used for the outcome variables at the state level and GRA level, respectively. HIX compare data is used for the main independent variable. The rest of the data sources are used for the institutional and socio-demographic characteristics.

I employ a linear fixed-effect model to estimate the effects of the premium on SSI and SSI child participation per 10,000 population at the state-year level and SSI participation per 10,000 population at the GRA-year level. I find that the SSI and SSI child participation per 10,000 population at the state-year level and SSI applications per 10,000 population at the GRA-year level have a negative relationship with the premium of a 30-year-old-with-two-children health plan without controlling for the time-invariant characteristics. The premium of a 30-year-old-with-two-children health plan does not significantly affect the SSI and SSI child applications per 10,000 population in the state-year level and SSI applications per 10,000 population in the GRA-year level when I control for these time-invariant characteristics. Kennedy and Blodgett (2012) predicted that the private insurance market could be more accessible and affordable for all workers and those with disabilities due to the premium credits and cost-sharing credits implemented by the ACA. Subsequently, fewer people with disabilities would depend on the disability program to get their health insurance.

I evaluate heterogeneity impacts through subgroup analyses by interacting the premium of a 30-year-old-with-two-children health plan with individual covariates such as Medicaid expansion, unemployment rate, poverty ratio, the fraction of high school diploma, percentage of the population reporting any difficulty, and percentage of the population with work limitations. I find evidence of the decline in SSI and SSI child programs participation from state-level and GRA-level data when I take the interaction between covariates, such as unemployment rate, poverty ratio, and a high school diploma. After taking the interaction between the premium variable and covariate (work limitations at the state level), I also find evidence of a fall in SSI and SSI child applications. Heterogeneous analyses also reveal a statistically significant increase in SSI participation using the interaction between the premium of a 30-year-old-with-two-children health plan and covariates such as percentage white, reported any difficulty, and work limitations in the GRA level.

My results suggest that an increase in the premium of a 30-year-old-with-two-children health plan decreases the SSI program participation for specific subgroups. One possible explanation could be that the insurers may be aiming at individuals who are not applying for disability programs, as these people are possibly not qualified for SSI. Therefore, it may have more price in elastic demand for health insurance for individuals that the insurers are targeting. A further likelihood is that access to health insurance can improve health, leading to lower rates of disability in the future and, thus, lower applications. In other words, fewer new applications will be left over on the margin for individuals living in the states where more of the population is already accessing public assistance. So, insurers could raise prices where fewer people are prone to be eligible for public assistance and where economies are better. To conclude, these subgroups receive health insurance through ACA marketplaces, which can contribute to decreasing disability applications and costs to the SSA.

2. Background

This study discusses the connection between participation in two different programs: the SSI and health insurance marketplaces and their substitution effects.

2.1. ACA marketplaces

The Patient Protection and Affordable Care Act (ACA), generally recognized as Obamacare, is a universal health insurance coverage for all US citizens. The ACA's major provisions took effect in 2014 with mandates, subsidies, Medicaid expansions, and health insurance marketplaces. 30 states are federally-facilitated marketplaces, 18 states are under the state-based marketplaces, and the remaining three states use the federal platform; however, they are considered state-based marketplaces (Kaiser Family Foundation 2022). Marketplaces allow families, individuals, and small businesses to compare different health plans and purchase plans that meet coverage standards. Prior to 2014, people with disabilities had difficulty purchasing healthcare insurance in the individual commercial market because insurers would not provide coverage for people with pre-existing conditions.

An individual can choose any of the following ways to apply for and enroll in marketplace health insurance coverage: (i) use the online platform healthcare.gov and create an account, (ii) obtain assistance from local people and organizations in an individual's ZIP code, (iii) take assistance from an approved enrollment partner that could be an insurance company or online health insurance agent, (iv) get assistance from the Marketplace Call Center by communicating over the phone and lastly, (v) fill out a paper copy of the application and mail it to the Department of Health and Human Services; individuals will receive eligibility results in the mail within two weeks.

2.2. SSI participation

The SSI program is the most extensive nationwide assistance program directed through the SSA that provides financial assistance to people with disabilities. The financial assistance includes providing health insurance benefits to people with disabilities. SSI took effect in 1972 and began paying benefits in 1974. An individual is required to have limited income and resources[4], citizenship status[5], and to be in one of three categories of individuals to qualify for the SSI benefits[6]. The SSA is accountable for assessing eligible individuals and provides awards after screening. However, the officials use a review process for all individuals who apply for this program because of the many medical conditions. Determining low income and disability under SSI programs includes five steps, and the process is time-consuming. The application can take an average of four months for disabled individuals who are qualified after these five steps. If the applicants are denied after these five steps, their applications will then be re-evaluated. If the applicants are rejected again, they may plead their cases to an administrative law judge. The time to reach determination of disability benefits for the applicants who make a petition to an administrative law judge may take two years.

If people with disabilities get SSI disability benefits and have Medicaid, they do not need to buy a marketplace plan or pay the penalty that people without coverage must pay. However, the application and eligibility of people with disability for Medicaid depend on their states. SSI beneficiaries automatically qualify for and receive Medicaid without applications in many states. In some states, SSI ensures Medicaid eligibility, but applicants must sign up for it. Some other states do not guarantee Medicaid eligibility though people with disabilities are eligible.

2.3. Literature review

This study adds to the literature assessing the relationship between the pricing of the ACA marketplace plans and disability claiming. Previous literature primarily focused on demographic, economic, and epidemiological SSI participation (Black et al. 2002; Rupp 2012; Rupp and Stapleton 1995; Schmidt 2012). Some literature has focused on the demand for marketplace plans (Abraham et al. 2017), the relationship between hospital concentration and premiums (Boozary et al. 2019), the effect of the expansion of Medicaid on risk pools and premiums in the market (Sen

[4] Determining the limited income and resources a couple has, only one person is eligible for the SSI.
[5] Some exceptions to be considered for non-citizen (see Daly and Burkhauser, 2003 for more detailed discussion on SSI eligibility criteria).
[6] The SSI considers three categories of individuals: children with disabilities under age 18, adults with disabilities aged 18-64, and individuals with disabilities or no disabilities if aged above 64. I focus on SSI and SSI for children with disabilities in my analysis for the state level and 0-18, 19-34, 35-44, 45-54, 55-64, and 65+ age categories aggregated for the GRA level.

and DeLeire 2018), and the response of cost-sharing reduction (CSR) subsidies and Advance Premium Tax Credits (APTCs) to premiums in the urban and rural areas (Anderson et al. 2019).

The literature on the effects of ACA marketplace plans on SSI participation remains absent. Some literature has described the effects of health insurance reform, Medicaid eligibility, Medicaid expansions, Medicaid coverage, and children's public health insurance expansions via ACA on SSI and Social Security Disability Insurance (SSDI) programs. Recently, others (Schmidt et al. 2020) have looked at the impact of the ACA Medicaid expansion on SSI and SSDI participation. They found no significant effects of the ACA Medicaid expansion on SSI and SSDI participation. Defining the average Medicaid expenditures for blind SSI receivers as Medicaid coverage, Yelowitz (1998) discovered that Medicaid expenditure increased SSI participation among low-income and disabled adults. These increases explain 20% of the SSI growth. Burns and Dague (2017) limited their study to nonelderly, nondisabled adults without dependent children and studied the effect of Medicaid eligibility on SSI participation from 2001 to 2013. They found that Medicaid coverage for the childless, nonelderly, and nondisabled adults decreases SSI participation.

Maestas et al. (2014) estimated the impacts of Massachusetts (MA) Health Reform on SSI and SSDI programs compared to the other non-reformed states. The authors found that the applications of SSI and SSDI programs increased to some extent after the MA Health Reform occurred relative to the neighboring states. They also found that SSI participation declined in low-insurance counties. Li (2015) studied the effects of the ACA on federal disability insurance (DI) eligibility using a dynamic interaction model and observed that the ACA improved health and therefore decreased DI eligibility. A study by Dillender (2016) reviewed information about the ACA's potential effects on disability insurance and worker's compensation. The author pointed out that some evidence suggests the ACA's potential impact could be to improve the population's health and thus help protect them from being disabled or injured during work. This ultimately helps to avoid disability-insurance-claiming behaviors.

Anand et al. (2018) studied the impact of ACA Medicaid Expansions on SSI and SSDI applications. They found a slighter decrease in SSI application rates in expansion states compared to non-expansion states after the Medicaid expansion took effect in 2014. Levere et al. (2019) studied the relationship between the Children's Health Insurance Program (CHIP) and SSI program. They found that increased CHIP eligibility did not affect the children's SSI applications or awards. Health insurance protects people from substantial economic damage when they face harmful health shocks. People with disabilities can access Medicaid coverage, which helps pay for medical expenses and may be one reason to apply for SSI. Using administrative data, Levere et al. (2021) analyzed the effect of the ACA dependent mandates on SSI claims among young adults. The authors found that the rates of SSI applications and recipients increased in the months around the adults' 26th birthday after the policy was enacted in 2010.

Recent studies show that marijuana laws and SNAP-associated work requirements affect disability claims. Maclean et al. (2019) showed that state medical marijuana laws' (MMLs) adoption increased SSDI and SSI applications and new beneficiary rates and lowered their termination rates. The authors (Maclean et al. 2021) also examined the effects of recreational marijuana laws' (RMLs) use on new SSDI and SSI applications and allowances. They found similar results to their study from MMLs in that the RMLs legalization increased the SSDI and SSI applications. Stith (2022) looked at the effects of work requirements under the Supplemental Nutritional Assistance Program (SNAP) on SSI applications and receipts. The researcher found no overall changes in SSI applications and recipients due to work requirements. However, a small, vulnerable subgroup may be affected by work requirements and switch to the SSI programs.

Most of the above literature indicates that people with disabilities can obtain health insurance through SSI or SSDI programs. The researchers found no effect, mixed effects, or adverse effects of the availability of or receiving health insurance on SSI or SSDI programs participation or receipts. None of the previous literature has studied the effect of ACA marketplace plans on disability program participation. This paper is the first effort to look at the effects of having a 30-year-old-with-two-children health plan via ACA marketplaces on the applications of SSI and SSI child programs. This study also examines whether receiving health insurance through a 30-year-old-with-two-children health plan via ACA marketplaces leads to an increase in SSI program participation among subgroups.

3. Conceptual Framework

The paper provides a conceptual framework for the demand for the premium of ACA marketplace plans and SSI participation. I conceptualize the cost of premium and SSI benefits as a utility-maximization framework following the well-established methodologies in the literature (Blundell et al. 1988; Moffitt 1983; Moffitt 1992), where individuals can reasonably evaluate the change in the price of premium and the applications of the SSI. Individuals who want to maintain SSI eligibility or apply for the program depend on whether the utility or net benefit exceeds from participating in the program compared to purchasing the premium from the ACA marketplace plans at affordable costs, holding other factors constant. Therefore, throughout this context, I hypothesize that eligibility or application for SSI is a function of the individual's income and disability status, and demand for healthcare access is a function of the individual's income and their choices of health plans from the ACA marketplaces at low costs.

The benefits of the SSI program include income support for low-income adults and healthcare support via Medicaid for adults and children. The benefits of purchasing health insurance through ACA marketplace plans include the availability of various health plans at affordable prices for uninsured individuals regardless of their financial, health, or disability status. The non-financial SSI program costs include exploring expenses about the program, collecting evidence for low income, and gathering information for disability. The costs of applying through ACA marketplaces are very similar or even more straightforward than the SSI program because ACA marketplaces do not require proof of any evidence of disability or health status. Sometimes the program exploration expenses that establish where to apply and how to apply can differ significantly and can prohibit individuals from applying for social benefits or disability programs (Currie 2004; Deshpande and Li 2019), including the SSI program.

On the other hand, a platform called "marketplaces" and sometimes called "exchanges" offers individuals shopping and enrollment services for different health plans via call centers, in-person help, and websites. Some states run their marketplaces, and others utilize the federal marketplaces. One common thing under both SSI and ACA marketplaces is that people can apply online. Still, all prospective applicants do not necessarily have internet access. Foote et al. (2019) found that online applications decreased transaction costs to SSDI applicants, and thus, lower transaction costs encouraged more applicants to enter the SSDI program.

The determination process for SSI is lengthy and time-consuming, whereas the eligibility process for ACA health plans is fast and straightforward. In terms of the determination and eligibility process, the benefits of ACA marketplace plans are more significant than the benefits of the SSI program. Individuals may not apply for the SSI because of the lengthy determination process, which may take up to two years if the applicant appeals for an initial denial. Additionally, one must collect proof of disability status from a registered doctor to be eligible for applying for

SSI. On the contrary, individuals do not need to submit proof of health status from a physician to be eligible to buy health insurance plans from marketplaces or wait for a long determination process. Dillender (2016) shows that SSI applicants are concerned about whether or not they are eligible for benefits and whether they can be out of work during the wait time for their disability status to be established. However, the author also states that eligibility for a health plan through exchanges and subsidized coverage from the ACA does not require employment or work status.

Economic, demographic, and institutional factors, such as age, sex, education, earnings, poverty status, race and ethnicity, health status, Medicaid expansion, other private and public health insurance program, and other mean-tested programs as explained in the literature section, can contribute to increase or decrease of the SSI participation. CSR subsidies, APTCs, hospital concentration, and Medicaid expansion affect the premiums in the marketplaces (Anderson et al. 2019; Boozary et al. 2019; Sen and DeLeire 2018).

In sum, getting health insurance through the ACA marketplace plans could reduce SSI participation if the premium cost is affordable for low-income individuals and people with disabilities. Assuming that the premium cost is not affordable for low-income individuals and people with disabilities, individuals could switch to the SSI program, which ultimately increases SSI program participation. Some individuals might still be willing to apply for the SSI program because they suffer from severe disabilities that can prevent them from working for a long time. Others can also shift to ACA marketplace plans regardless of higher premium prices to avoid the wait time during the determination process of the SSI program.

4. Data and Variables

4.1. Data

This study uses different data sources to measure the effect of ACA marketplace plans on disability claiming. For independent variables, I use plan-level data from HIX Compare (Robert Wood Johnson Foundation 2020), public use files of individuals, and small-group-insured markets in all fifty states, including Washington, D.C. The plan-level data have information on health plan characteristics, such as premiums and benefits from 2014 to 2022. I utilize data for outcome variables from two primary sources: SAMWD and the restricted version of administrative data from SSA. SAMWD is publicly available data downloaded from the Social Security

Administration website[7]. I collect data from the UKCPR[8] (University of Kentucky Center for Poverty Research 2021) and the KFF[9] for institutional control variables. For socio-demographic characteristics, I use CPS data at the state-year level.

The smallest area in SAMWD data is only available at the state level. I merged it with HIX Compare data at the state and year level, though they have the smallest area at the GRA level. The timeframe for this study is 2015-2019. I exclude 2014 because of missing observations in some states and 2020-2022 because of the COVID-19 pandemic. To create a final dataset from all different sources, I collapse SAMWD data at the state and year levels. Then I append individual HIX Compare files from 2015-2019 and collapse the average premiums at the state and year levels. These data are then merged with SAMWD, UKCPR, and CPS data at the state and year levels. The total observations consist of 255 state-year observations.

As the HIX compare data have the smallest area at the GRA level, I requested the county-level data from the SSA. The restricted version of administrative data is constructed at the county-level counts of SSI applications. These counts are constructed by board age groups in months and years from 2015-2019. SSA suppressed the SSI application counts by county-year and age groups in each cell if they were between 1 and 9. Some missing values occurred from the suppression. I attribute the missing cell in three ways: either with a random number between one and nine, with a median of five, or by dropping the missing values. Foote et al. (2019) use a random number between zero and nine to impute the county-level age-group missing values for the SSDI applications, appeals, and allowances. Schmidt et al. (2020) recode the missing values with five. County-level SSI applications data allow me to merge the county-level data with GRA-level HIX compare data using the County to Rating Area Crosswalk included in each year's HIX compare data files. I use the rating area definitions from the Centers for Medicare and Medicaid Services (CMS)[10]. States may have different rating area definitions by market (small group vs. individual)

[7]SSA State Agency Monthly Workload Data, https://www.ssa.gov/disability/data/ssa-sa-fywl.htm

[8] University of Kentucky Center for Poverty Research Data, http://ukcpr.org/resources/national-welfare-data

[9] https://www.kff.org/medicaid/issue-brief/status-of-state-medicaid-expansion-decisions-interactive-map/

[10]Each state set number of GRAs followed by the Market Rules and Rate Review Final Rule (45 CFR Part 147). This rule provides that all issuers must uniformly use their rate setting within a state. Metropolitan Statistical Areas (MSAs) within each state are the default GRAs for that state. If the area of a state is not included in MSAs, counties or zip code are considered as GRAs for that area. GRAs could be a single MSA, county, zip code, or combination of more than one of them. See more information: https://www.cms.gov/CCIIO/Programs-and-Initiatives/Health-Insurance-Market-Reforms/state-gra

and year. I use individual markets for the County to Rating Area Crosswalks from the same market and year. To create a final dataset for the GRA-year[11] level, I first collapse the imputed administrative data at the county and year level, then merge the county to GRA each year. I also collect the population counts by county and year level from the National Center for Health Statistics Vintage 2020 estimates (National Center for Health Statistics 2021) and merge county to GRA each year to make SSI applications per capita. The total observations consist of 2,489 GRA-year observations with imputation and 1,470 without imputation. I further merged these data with CPS for socio-demographic characteristics, KFF for Medicaid expansion, and the Bureau of Labor Statistics (BLS) Local Area Unemployment series for the unemployment rate to adjust for the socio-economic and demographic characteristics. The total observations then consist of 877 GRA-year observations with imputation and 802 without imputation.

This research's limitation includes the inability to use monthly data for both HIX Compare with SAMWD data or restricted data because of a mismatch in the dates, though they are available.

4.2. Variables

The outcome variables are the applications of SSI and SSI for children at the state-year level from the SAMWD and applications of SSI aggregated at the GRA-year level from the restricted version of administrative data from SSA. I use applications' information to see if having experience with increasing premium prices can lead people to shift more on SSI and SSI Child with disability applications. Therefore, the explanatory variable of interest is the cost of the premium for one individual aged 30 and two children aged 0-14 from the HIX Compare. The HIX Compare data have the cost information on the other health plan categories: premium for a child aged 0-14, premium for an individual aged 27, premium for an individual aged 50, and premium for two individuals aged 30 and two children aged 0-14. The premium for a child aged 0-14 is removed due to missing observations. I have chosen the premium of a 30-year-old-with-two-children health plan for two reasons. First, I focus on the premium of a 30-year-old-with-two-children health plan, assuming it could most likely impact the SSI Child program. Second, the premium for an individual aged 27, the premium for an individual aged 50, and the premium for two individuals aged 30 and two children aged 0-14 move together with the premium of a 30-year-old-with-two-

[11] GRA level data allow me to find more variation between SSI applications and premium that could lead to more robust outcomes compared to state-level data.

children health plan, causing multicollinearity. The premium of a 30-year-old-with-two-children health plan itself could capture the impact of changes in other health plans. So, I remove the premium for an individual aged 27, the premium for an individual aged 50, and the premium for two individuals aged 30 and two children aged 0-14 from my main analyses. Table A1 shows the correlation matrix between premium variables.

5. Empirical Model

5.1. Ordinary Least Squares

I use locally weighted regressions to compare the correlation between SAMWD outcome measures and the premium of a 30-year-old-with-two-children health plan. Then a linear fixed-effect model is estimated by Ordinary Least Squares (OLS) for primary analysis in the following:

$$Y_{st} = \beta_0 + \beta_1 Premium_{st} + X_s + \delta_s + \theta_t + \varepsilon_{st} \quad (1)$$

where Y_{st} represents the SAMWD outcome measures in state s in year t, adjusted by population per 10, 000. $Premium_{st}$ is a continuous variable for the average premium of a 30-year-old-with-two-children health plan in state s and year t. X_s includes a vector of state-level control variables, such as whether a state expanded Medicaid, the unemployment rate, the poverty ratio (fraction of the population below the FPL), percentage of the population that reported any difficulty, percentage of the population with work limitations, the fraction of population by race/ethnicity, the fraction of population ages (27-64), by gender (female or male), and the fraction of high school diploma. These variables help control for time-varying factors that could affect SSA applications. For example, controlling for Medicaid Expansion[12], the percentage of the population that reported any difficulty and the percentage of the population with work limitations is particularly important, as many people with disabilities can obtain health insurance through SSI. The unemployment rate is another essential variable, as Autor and Duggan (2003) show that the increase in SSDI lowered

[12] Schmidt et al. (2020) have looked at the impact of the ACA Medicaid expansion on SSI and SSDI participations and found no significant effects. Burns and Dague (2017) limited their sample for nonelderly, nondisabled adults without dependent children and studied the effect of Medicaid eligibility on SSI participation from 2001 to 2013. They found that the Medicaid coverage for childless, nonelderly, nondisabled adults decreases the participation in SSI.

the unemployment. The poverty ratio is used to control for general economic conditions. δ_s and θ_t are the state-fixed effects and year-fixed effects, respectively. Standard errors are clustered at the state level to account for arbitrary correlation and heteroskedasticity. Table A2 shows the descriptive statistics for control variables at the state-year level. Fig. 3 and Fig. 4 show the locally weighted regression line to discuss the relationship between SAMWD outcome measures and the premium of a 30-year-old-with-two-children health plan.

In addition to my primary model, I conduct robustness checks using the variation of (1). I look at the effects of different health plans, such as the premium for an individual aged 27, the premium for an individual aged 50, and the premium for two individuals aged 30 and two children aged 0-14 as it existed in the HIX Compare data, on SSI and SSI child applications. My final robustness checks include using GRA-year levels information in the following form:

$$Y_{gt} = \beta_0 + \beta_1 Premium_{gt} + X_g + \delta_g + \theta_t + \varepsilon_{gt} \qquad (2)$$

where Y_{gt} represents the outcome measures in GRA g in year t, adjusted by population per 10,000. $Premium_{gt}$ is the average premium of a 30-year-old-with-two-children health plan in GRA g and year t. X_g includes a vector of control variables mentioned above at the GRA level. Table A6 shows the descriptive statistics for control variables at the GRA-year level from all three imputation methods.

5.2. Interaction with covariates

I also test the interaction of the state-level and GRA-level controls with the premium of a 30-year-old-with-two-children health plan to generate differential impacts on various groups of people with disabilities at the state-level and GRA-level using Equation (3). Covariates include Medicaid expansion at the state level, unemployment rate, poverty ratios, the fraction of white population, the fraction of high school diploma, percentage of the populations that reported any difficulty, and percentage of the individuals with work limitations.

$$Y_{st/gt} = \beta_0 + \beta_1 Premium_{st/gt} * \text{Interaction term} + X_{s/g} + \delta_{s/g} + \theta_t + \varepsilon_{st/gt} \quad (3)$$

where *Interaction term* is the control variable mentioned above for either state or GRA level.

6. Results

6.1. Descriptive statistics

Fig. 1 shows the percentage of applications per 10,000 population for SSI and SSI for children over time.

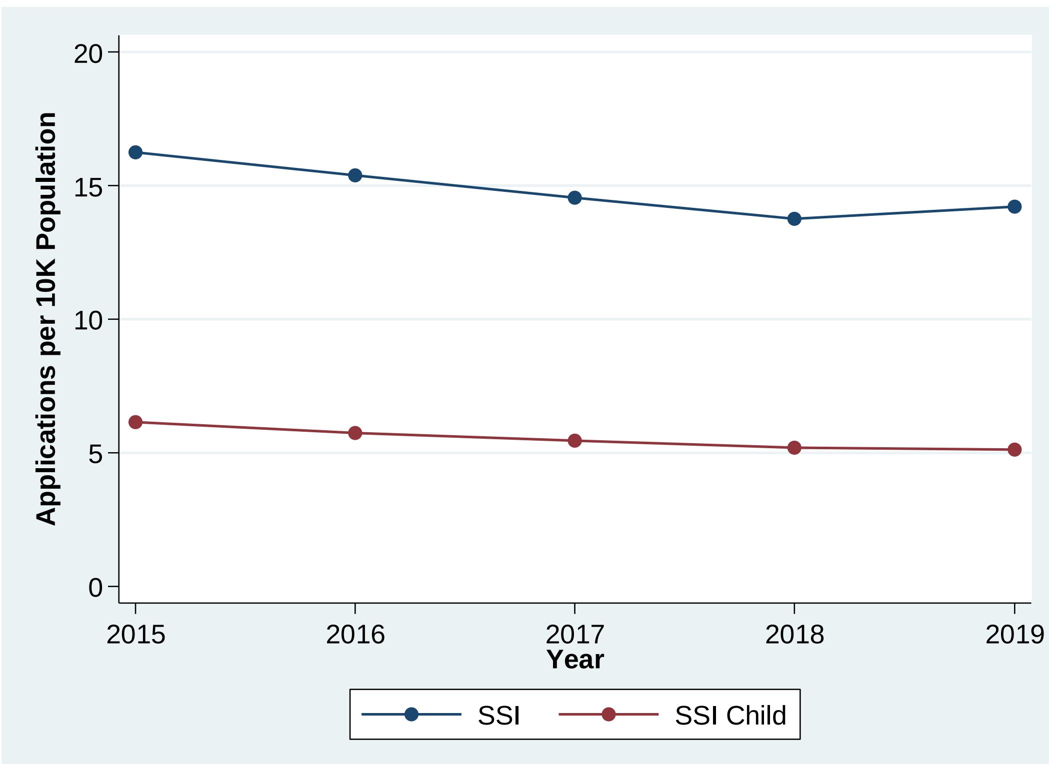

Fig. 1 SSA Applications by Year.

Source: SSA State Agency Monthly Workload Data

Fig. 1 indicates general decreases in all outcome measures over time, although the decline in SSI child applications is steepest. These general declines in trends are well explained in SSA Briefing Paper No. 2019-01 (Social Security Administration 2019). Fig. 2 shows the changes in the premium of a 30-year-old-with-two-children health plan over time. The cost of the premium of this plan has increased since 2018 in almost all states. This increase could be explained by the termination of CSR subsidies in 2017 (Anderson et al. 2019). The health plan also varies within the states. These variations could be by age, family status, tobacco use, and coverage types for people living in states, which is well documented in KFF Issue Briefs (Cox et al. 2011; Levitt et al. 2018). Table 1 shows the descriptive statistics for the outcome and main explanatory variable.

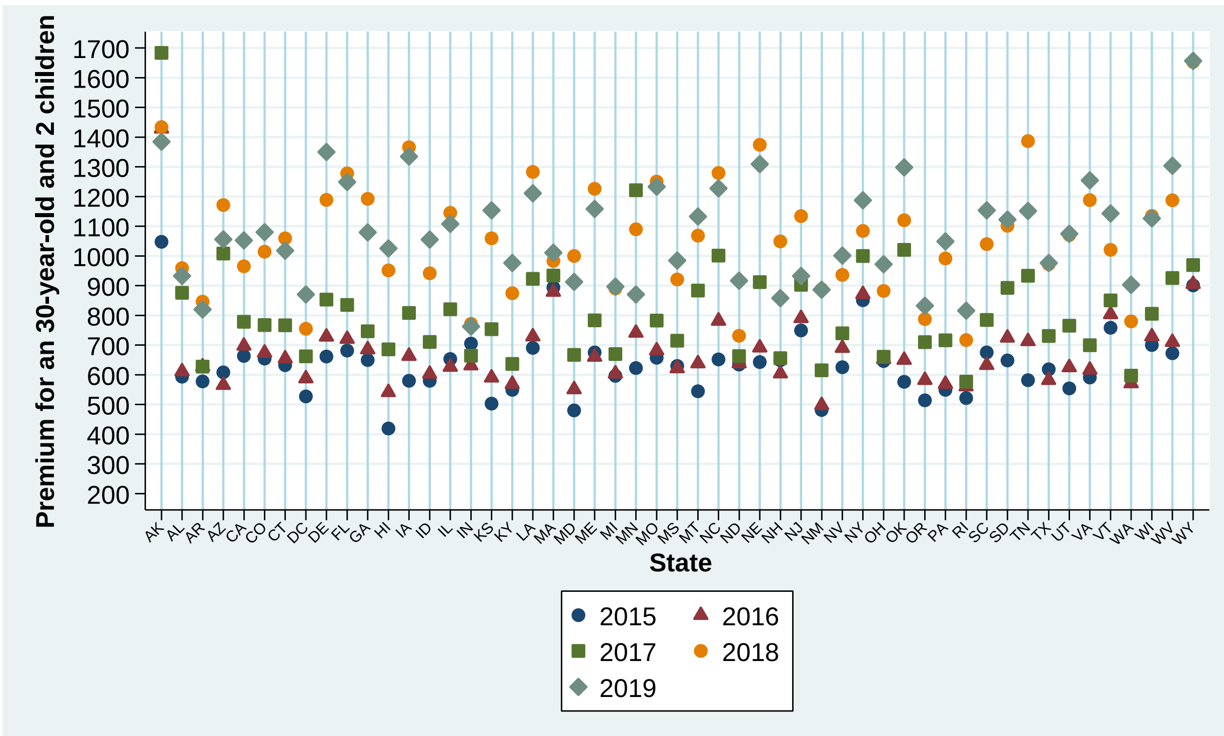

Fig. 2 Premiums change over time.

Table 1: Descriptive Statistics for State-Year level

	Mean	Std.	Min	Max
SSI Applications per 10,000	29.08	11.32	10.85	65.58
SSI Child Applications per 10,000	10.85	5.50	2.58	30.25
Premium for one individual age 30 and 2 children	852.58	247.66	419.31	1683.27
Observations	255			

Notes: Data cover the period from 2015-2019. All outcomes listed are from SAMWD. Independent variable is listed from the HIX Compare.

The sample means for SSI and SSI child applications per 10, 000 population are 29.08 and 10.85, respectively. The mean cost of premium of a 30-year-old-with-two-children health plan is 852.58.

In addition to the simple sample statistics, I find the between versus within summary statistics to dig into the between versus within variation reported in Table A3. The variation between states is slight (standard deviation is 11.15 and 5.44, respectively) compared to the overall variation (standard deviation is 11.32 and 5.50, respectively) for the SSI and SSI child. On the other hand, the variation between states is considerable (standard deviation is 136.25) compared to the overall variation (standard deviation is 247.66) for the premium of a 30-year-old-with-two-children health plan. Opposite to the between variation, the variation within states is large (standard deviation is 2.38 and 1.07, respectively) compared to the overall variation (standard deviation is 11.32 and 5.50, respectively) for the SSI and SSI child. The variation within states is slight (standard deviation is 207.52) compared to the overall variation (standard deviation is 247.66) for the premium of a 30-year-old-with-two-children health plan. I use state-fixed effect to adjust for the within-states variation.

Table B1 presents the descriptive statistics from all three imputation methods used to incorporate the missing values in the county to GRA conversion from the SSA-restricted version of county-level data. Imputation methods 1 (with a random value between one and nine for the suppressed value) and 2 (with a median of five) provide similar sample statistics. The sample mean for the SSI applications per 10,000 population for Panel A is 105.89 and 105.96 for Panel B. Dropping the missing value, the sample mean for the SSI applications per 10,000 population is 43.85. From all three imputation methods, the simple means for the premium of a 30-year-old-with-two-children health plan are 873.38, 873.38, and 803.31.

Table B2 represents the descriptive statistics for GRA-year-level SSI applications per 10,000, premium of a 30-year-old-with-two-children health plan, and other control variables when these data are merged with CPS. Similarly, imputation methods 1 and 2 provide similar sample statistics. The sample means for the SSI application per 10,000 population for Panel A and for Panel B are 103.26 and 103.25, respectively. Imputation method 3 provides the sample mean for the SSI application per 10,000 population as 65.73. From all three imputation methods, the simple means for the premium of a 30-year-old-with-two-children health plan are 830.09, 830.09, and 831.98.

6.2. Main regression results

I intend to examine whether increasing the premium cost of a 30-year-old-with-two-children health plan under ACA leads people to shift to SSI programs to gain health insurance. First, I use simple regressions to explore the relationship between SSI and SSI child applications per 10,000 population and the premium of a 30-year-old-with-two-children health plan. The results are presented in column 1 in Table 2 for SSI applications and column 1 in Table 3 for SSI child applications. The results suggest the premium of a 30-year-old-with-two-children health plan has a negative and statistically significant effect on the SSI and SSI child applications. However, the results are not adjusted for the time-invariant state-level characteristics and factors that could affect all states in a given period.

I incorporate these factors in Equation (1) and report the results in column 3 in Table 2 for the SSI applications per 10, 000 population and column 3 in Table 3 for the SSI child applications per 10, 000 population.

Column 2 in Table 2 represents the regression results for applications of SSI, including only state-fixed and year-fixed effects. One unit increase in the average premium of a 30-year-old-with-two-children health plan could lead to a 0.001-unit increase in the SSI application per 10, 000 population if the coefficient was statistically significant. However, the coefficient is not statistically significant. Column 3 in Table 2 represents the estimates from Equation (1) for my main analysis, including controls and state-fixed and year-fixed effects for the applications of SSI. The coefficient, 0.002, is not statistically significant and can be interpreted as the average premium one standard deviation above the mean experiencing an increase in SSI application per 10, 000 population of approximately 41.6 percent. The estimate could explain 1.43 percent of the increase in SSI applications per 10, 000 population for the average state between 2015 and 2019. Column 4 in Table 2 represents the regression results for applications of SSI, including controls and state and year fixed effects with adjusting of non-linearity by adding the squared term of the average premium of a 30-year-old-with-two-children health plan. The coefficient is 0.004 and is not statistically significant. The result is interpreted in column 3 of Table 2. The result could suggest that states with an average premium of a 30-year-old-with-two-children health plan one standard deviation above the mean experience an increase in SSI application per 10, 000 population of approximately 83 percent. And the estimate could explain 2.9 percent of the increase in SSI applications per 10, 000 population for the average state between 2015 and 2019.

Table 2: Regression Results - SSI Applications per 10,000 population.

	(1) SSI	(2) SSI	(3) SSI	(4) SSI
Premium for one individual age 30 and 2 children	-0.009***	0.001	0.002	0.004
	(0.003)	(0.002)	(0.002)	(0.005)
Premium for one individual age 30 and 2 children^2				-0.000
				(0.000)
Constant	36.948***			
	(2.498)			
Observations	255	255	255	255
R-squared	0.041	0.980	0.983	0.983
Controls	-	-	Yes	Yes
State Fixed Effects	-	Yes	Yes	Yes
Year Fixed Effects	-	Yes	Yes	Yes

Based on 255 state-year observations. Outcomes are measured per 10,000 population. Controls include the state expanded Medicaid, the unemployment rate, the poverty ratio (fraction of the population below the FPL), the percentage of the population that reported any difficulty, the percentage of the population with work limitations, the fraction of the population by race/ethnicity, the fraction of population ages (27-64), by gender (female or male), and fraction with a high school diploma. All regressions include state-fixed and year-fixed effects with standard errors clustered at the state level and reported in parentheses, except for column 1.

I find very similar results for the SSI child participation as reported in Table 3. Including only state- and year-fixed effects, the coefficient is 0.001 in column 2 in Table 3. The result can be interpreted similarly to column 2 in Table 2. Adding controls with state- and year-fixed effects, column 3 in Table 3 shows the coefficient is still 0.001; this is my main analysis for SSI child application per 10,000 population. However, adjusting for the non-linearity by adding the squared term of premium in column 4 in Table 3, I find that the coefficient is 0.005. This result is illustrated similarly in column 4 in Table 2. The average premium one standard deviation above the mean experiences an increase in SSI child application per 10, 000 population of approximately 104 percent. The estimate could explain 0.96 percent of the increase in SSI child applications per 10, 000 population for the average state between 2015 and 2019. All coefficients from all specifications for the SSI child applications are not statistically significant.

Table 3: Regression Results - SSI Child Applications per 10,000 population.

	(1) SSI Child	(2) SSI Child	(3) SSI Child	(4) SSI Child
Premium for one individual age 30 and 2 children	-0.004***	0.001	0.001	0.005
	(0.001)	(0.001)	(0.001)	(0.003)

Premium for one individual age 30 and 2 children^2				-0.000
				(0.000)
Constant	14.515***			
	(1.216)			
Observations	255	255	255	255
R-squared	0.038	0.980	0.984	0.984
Controls	-	-	Yes	Yes
State Fixed Effects	-	Yes	Yes	Yes
Year Fixed Effects	-	Yes	Yes	Yes

Notes: *** p<0.01, ** p<0.05, and * p<0.1 indicate levels of significance. Each cell represents a separate regression based on 255 state-year observations. Outcomes are measured per 10,000 population. Controls include the state expanded Medicaid, the unemployment rate, the poverty ratio (fraction of the population below the FPL), the percentage of the population reported any difficulty, the percentage of the population with work limitations, the fraction of the population by race/ethnicity, the fraction of population ages (27-64), by gender (female or male), and fraction with a high school diploma. All regressions include state-fixed and year-fixed effects with standard errors clustered at the state level and reported in parentheses, except for column 1.

6.3. Robustness checks

HIX Compare data have information on other health plans such as premium for an individual aged 27, premium for an individual aged 50, and premium for two individuals aged 30 and two children. I have run some robustness checks to see how other health plans affect the SSI and SSI child programs. Tables A5 and A6 display the results of these robustness checks. The six robustness checks are run utilizing either the premium for an individual aged 27, or premium for an individual aged 50, or premium for two individuals aged 30 and two children health plan instead of premium for an individual aged 30 and two children health plan for SSI and SSI child applications per 10,000 population. Both tables show no effect on the application for SSI and SSI child programs.

Table B3 demonstrates the results of GRA-level regression without adjusting for the controls and GRA-fixed and year-fixed effects from the aggregated SSI applications in the GRA-year level, adjusted by 10,000 population and using the three imputation methods. Columns 1 and 2 present the same estimates from imputation method 1 and 2, imputing the missing values by a random number between one and nine and by a median of five for the SSI applications. The result suggests that one unit increase in premium for one individual-aged-30-and-two-children health plan leads to 0.063 units decrease in SSI application per 10,000. However, column 3 shows that if the premium price for an individual-aged-30-and-two-children health plan increases by one unit, it leads to a decrease in SSI application per 10,000 population by 0.078 units. These results are consistent with the simple regression results presented in column 1 in Table 2 and 3 for state-level data without including controls and adjusting for the time-invariant state-level characteristics and factors that could affect all states in a given period.

Table B4 shows a similar pattern of results, including only GRA-fixed and year-fixed effects compared to state-level results from all imputation methods. One unit increase in the average premium for one-individual-and-two-children health plan could lead to a 0.015-unit, 0.016-unit, and 0.016-unit, respectively, increase in the SSI application per 10, 000 population if the coefficient was statistically significant. However, the coefficient is not statistically significant.

Table B5 presents the estimates using Equation (2) and the three imputation methods presented in column 1 (for method 1), column 2 (for method 2), and column 3 (for method 3). Again, the results are similar using imputation methods 1 and 2, which is a positive coefficient of 0.021, and are not statistically different from zero. The coefficient is 0.029 from column 3, using imputation method 3, and still shows no significant effect of premium for one-individual-and-two-children health plan on the SSI applications per 10,000 at the GRA-year levels. Overall, the GRA-year level results are consistent with the state-year level analyses, including all controls for the primary model.

6.4. Interaction results with covariates

I run some specifications with the interaction between the premium of a 30-year-old-with-two-children health plan and control variables, such as Medicaid expansion, unemployment rate, poverty ratio, the fraction of high school diploma, percentage of the population reporting any difficulty, and percentage of the population with work limitations. I intend to see if there are significant differences between those subgroups of shifting to SSI and SSI child programs. The results are estimated using Equation (3), and the coefficients for the premium variable, individual covariate, and interaction between premium and that covariate is reported in Table 4-10 for state-level data and Table B6-B12 for GRA-level data.

The evidence from a previous study suggested that Medicaid expansion could affect private health insurance markets. Sen and DeLeire (2018) found the premiums of marketplace plans are 11% lower in Medicaid expansion states. My result is consistent with the previous study. Suppose the cost of premiums increases; people with disabilities and low incomes are 0.0004 and 0.0001 percent more likely to have health insurance through SSI and SSI child programs in the Medicaid expansion states compared to non-Medicaid expansion states presented in Table 4. However, the results are not statistically significant.

Table 4: Heterogeneity test - Interaction with Medicaid Expansion.

	(1) SSI	(2) SSI Child
Premium for one individual aged 30 and 2 children	0.001	0.001
	(0.002)	(0.001)
Medicaid Expansion	-0.724	-0.831
	(1.945)	(1.079)
Premium for one individual aged 30 and 2 children*Medicaid Expansion	0.0004	0.0001
	(0.002)	(0.001)
Observations	255	255
R-squared	0.983	0.984
Controls	Yes	Yes
State Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes

Notes: *** p<0.01, ** p<0.05, and * p<0.1 indicate levels of significance. Each cell represents a separate regression based on 255 state-year observations. Outcomes are measured per 10,000 population. Controls include the state expanded Medicaid, the unemployment rate, the poverty ratio (fraction of the population below the FPL), the percentage of the population reported any difficulty, the percentage of the population with work limitations, the fraction of the population by race/ethnicity, the fraction of population ages (27-64), by gender (female or male), and fraction with a high school diploma. All regressions include state-fixed and year-fixed effects with standard errors clustered at the state level and reported in parentheses.

On the other hand, Table B6 shows that the coefficients, 0.004, 0.004, and 0.01 become negative using all three imputation methods for the GRA data. Since the results are not statistically significant from zero, it could be within five percent in either direction of the confidence interval.

My main results indicate that the unemployment rate significantly affects SSI and SSI child programs participation. Adding interaction between premium and unemployment rate, I estimate that if the premium increases by one unit, it may lead to an increase in SSI and SSI child programs participation per 10, 000 population by 0.007 and 0.004 units, respectively. The coefficients for only individual covariates are 2.59 and 1.45. That means if the unemployment rate increases by one unit, the SSI and SSI child programs participation increases by 2.59 units and 1.45 units, respectively. However, if I interact the unemployment rate with premium, it provides the opposite result of my hypothesis. I hypothesize that if both premium and unemployment rates increase, people with disabilities will apply more for SSI programs to get health insurance. The results suggest that if the cost of the premium of a 30-year-old-with-two-children health plan and the unemployment rates increase, people with disabilities and low incomes are 0.001 percent less likely to apply for SSI and SSI child programs to get their health insurance – see Table 5. One previous study showed that a rise in the local unemployment rates tends to be linked with a reduction in the SSI and SSI child initial allowance rate (Rupp 2012). Nichols et al. (2017) documented that SSI applications and unemployment rates are negatively associated with a person whose unemployment spell begins when the unemployment rates are relatively high.

Table 5: Heterogeneity test - Interaction with the unemployment rate.

	(1) SSI	(2) SSI Child
Premium for one individual aged 30 and 2 children	0.007*	0.004**
	(0.004)	(0.002)
Unemployment rate	2.590***	1.454***
	(0.740)	(0.304)
Premium for one individual aged 30 and 2 children*Unemployment rate	-0.001*	-0.001**
	(0.001)	(0.000)
Observations	255	255
R-squared	0.983	0.985
Controls	Yes	Yes
State Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes

Notes: *** p<0.01, ** p<0.05, and * p<0.1 indicate levels of significance. Each cell represents a separate regression based on 255 state-year observations. Outcomes are measured per 10,000 population. Controls include the state expanded Medicaid, the unemployment rate, the poverty ratio (fraction of the population below the FPL), the percentage of the population reported any difficulty, the percentage of the population with work limitations, the fraction of the population by race/ethnicity, the fraction of population ages (27-64), by gender (female or male), and fraction with a high school diploma. All regressions include state-fixed and year-fixed effects with standard errors clustered at the state level and reported in parentheses.

Table B7 provides the results from the GRA level data and the interaction between the premium of a 30-year-old-with-two-children health plan and the unemployment rate from all three imputation methods. The result from interaction terms from GRA-level data supports the same result from state-level data. If both premium and unemployment rates increase, people with disabilities are 0.003 percent less likely to apply for SSI programs to get health insurance, as reported in column 3 in Table B7.

Suppose I add the interaction between premium and the percentage of the population below the poverty line in my main regression. In that case, one unit increase in premium may lead to a 0.005 unit and 0.004 unit increase in SSI and SSI child applications per 10, 000 population, as reported in Table 6. One unit increase in the poverty ratio may increase SSI child applications per 10, 000 population by 24.57 units. And the result suggests that if the cost of the premium of a 30-year-old-with-two-children health plan increases and people with disabilities and low income are below the poverty line, they are 0.025 percent less likely to apply for the SSI child program to get health insurance.

Table 6: Heterogeneity test - Interaction with poverty ratio.

	(1) SSI	(2) SSI Child
Premium for one individual aged 30 and 2 children	0.005*	0.004**
	(0.003)	(0.002)
Poverty ratio	40.658	24.566**
	(29.704)	(11.875)
Premium for one individual aged 30 and 2 children*Poverty ratio	-0.034	-0.025**
	(0.028)	(0.011)
Observations	255	255
R-squared	0.983	0.985
Controls	Yes	Yes
State Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes

Notes: *** p<0.01, ** p<0.05, and * p<0.1 indicate levels of significance. Each cell represents a separate regression based on 255 state-year observations. Outcomes are measured per 10,000 population. Controls include the state expanded Medicaid, the unemployment rate, the poverty ratio (fraction of the population below the FPL), the percentage of the population reported any difficulty, the percentage of the population with work limitations, the fraction of the population by race/ethnicity, the fraction of population ages (27-64), by gender (female or male), and fraction with a high school diploma. All regressions include state-fixed and year-fixed effects with standard errors clustered at the state level and reported in parentheses.

Table B8 reports the results from the GRA-level data with the interaction between the premium of a 30-year-old-with-two-children health plan and poverty ratio. I find that one unit increase in the poverty ratio may increase SSI applications per 10, 000 population by 44.26 units from imputation method 1 and 44.66 units from imputation method 2. And the coefficients of interaction terms suggest that if the cost of the premium of a 30-year-old-with-two-children health plan increases and people with disabilities and low incomes are below the poverty line, they are 0.055 and 0.056 percent less likely to apply for SSI programs to get health insurance.

There is a connection between TANF and SSI programs (Nadel et al. 2003; Wamhoff and Wiseman 2005). SSI program eligibility rules do not count need-based assistance as TANF (Wamhoff and Wiseman 2005). This shows us that people below the poverty rate and receiving TANF are less likely to shift to the SSI program. Another possible explanation for the negative coefficients from the interaction term for the unemployment rate and poverty ratio is that people with disabilities and low incomes may already have entered the SSI program. So, fewer eligible individuals exist on the margin. To strengthen this explanation, I run some robustness checks using the interaction between the premium for 30-year-old-and-two children health plan and the covariates, such as the percentage of SSI recipiency and Medicaid recipiency. If the cost of the premium for a 30-year-old-with-two-children health plan and the percentage of SSI recipiency increase, people with disabilities and low incomes are less likely to apply for the SSI and SSI child programs (results available upon request). The interaction between the premium of a 30-year-old-with-two-children health plan and the percentage of Medicaid recipiency provides a similar result. If the cost of the premium of a 30-year-old-with-two-children health plan and the percentage of Medicaid recipiency increase, people with disabilities and low incomes are less likely to apply for the SSI child program (results available upon request).

Education is an important socio-demographic factor that may affect SSI program participation. Sannicandro et al. (2018) found that postsecondary education is connected with improved employment, weekly earnings, and reduced dependency on SSI benefits. Table 7 shows from state-level data that if the cost of premium increases for people with high school diplomas, they are 0.023 percent less likely to apply for the SSI child program to get health insurance. Adding this interaction to my model provides evidence of an increase in SSI child program participation by 0.006 percent if the cost of premium increases by one unit. I also run a robustness check using the percentage with a college degree and find that an increase in the percentage with a college degree increases the SSI applications (results available upon request). This result is consistent with the above study by Sannicandro et al. (2018).

Table 7: Heterogeneity test - Interaction with fraction high school diploma.

	(1) SSI	(2) SSI Child
Premium for one individual aged 30 and 2 children	0.007	0.006*
	(0.007)	(0.003)
Fraction with High School Diploma	15.977	18.520
	(34.533)	(12.768)
Premium for one individual aged 30 and 2 children*High school diploma	-0.025	-0.023*
	(0.035)	(0.013)
Observations	255	255
R-squared	0.983	0.985

Controls	Yes	Yes
State Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes

Notes: *** p<0.01, ** p<0.05, and * p<0.1 indicate levels of significance. Each cell represents a separate regression based on 255 state-year observations. Outcomes are measured per 10,000 population. Controls include the state expanded Medicaid, the unemployment rate, the poverty ratio (fraction of the population below the FPL), the percentage of the population reported any difficulty, the percentage of the population with work limitations, the fraction of the population by race/ethnicity, the fraction of population ages (27-64), by gender (female or male), and fraction with a high school diploma. All regressions include state-fixed and year-fixed effects with standard errors clustered at the state level and reported in parentheses.

Table B9 presents the results from taking the interaction between the premium of a 30-year-old-with-two-children health plan and high school diploma at the GRA level. I find consistently compared to state-level that if the cost of premium increases for people with high school diplomas, they are 0.043 and 0.040 percent less likely to apply for SSI programs to get health insurance. Results were found through imputation method 1 and imputation method 2.

Tables 8 and B10 show the results from state-level and GRA-level data by taking the interaction between the premium of a 30-year-old-with-two-children health plan and the percentage of whites. Table B10 states that if the premium cost increases, whites are 0.071 percent more likely to apply for the SSI program to get health insurance. This positive coefficient explains that whites are the most prominent race group receiving SSI benefits (Scott 1999; Berry et al. 2012).

Table 8: Heterogeneity test - Interaction with whites.

	(1) SSI	(2) SSI Child
Premium for one individual aged 30 and 2 children	0.005	0.001
	(0.003)	(0.001)
Fraction Non-Hispanic white	-5.467	-1.030
	(19.249)	(8.167)
Premium for one individual aged 30 and 2 children*White	-0.005	-0.000
	(0.004)	(0.002)
Observations	255	255
R-squared	0.983	0.984
Controls	Yes	Yes
State Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes

Notes: *** p<0.01, ** p<0.05, and * p<0.1 indicate levels of significance. Each cell represents a separate regression based on 255 state-year observations. Outcomes are measured per 10,000 population. Controls include the state expanded Medicaid, the unemployment rate, the poverty ratio (fraction of the population below the FPL), the percentage of the population reported any difficulty, the percentage of the population with work limitations, the fraction of the population by race/ethnicity, the fraction of population ages (27-64), by gender (female or male), and fraction with a high school diploma. All regressions include state-fixed and year-fixed effects with standard errors clustered at the state level and reported in parentheses.

Percent reporting any difficulty and work limitations significantly affects SSI and SSI child programs participation. Including the interaction between the premium of a 30-year-old-with-two-children health plan and the percentage of reporting any difficulty in the regression model indicates that one unit increase in premium of a 30-year-old-with-two-children health plan leads to 0.004 units increase of SSI child application – see Table 9.

Table 9: Heterogeneity test - Interaction with % reported any difficulty.

	(1) SSI	(2) SSI Child
Premium for one individual age 30 and 2 children	0.006	0.004**
	(0.005)	(0.002)
Percent reported any difficulty	55.269	40.151
	(65.095)	(24.182)
Premium for one individual aged 30 and 2 children*% reported any difficulty	-0.048	-0.040
	(0.064)	(0.024)
Observations	255	255
R-squared	0.983	0.985
Controls	Yes	Yes
State Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes

Notes: *** p<0.01, ** p<0.05, and * p<0.1 indicate levels of significance. Each cell represents a separate regression based on 255 state-year observations. Outcomes are measured per 10,000 population. Controls include the state expanded Medicaid, the unemployment rate, the poverty ratio (fraction of the population below the FPL), the percentage of the population reported any difficulty, the percentage of the population with work limitations, the fraction of the population by race/ethnicity, the fraction of population ages (27-64), by gender (female or male), and fraction with a high school diploma. All regressions include state-fixed and year-fixed effects with standard errors clustered at the state level and reported in parentheses.

Table B11 shows that an increase in reporting any difficulty by one percent leads to SSI program participation decreasing by 250.30 units. The second column of Table B11 also shows that if the premium cost increases for people who reported any difficulty, they are 0.280 percent more likely to apply for the SSI program. This positive coefficient supports that some people with severe disabilities cannot work, which lowers their economic well-being (Meyer and Mok 2014), and they can remain dependent on disability programs.

Table 10 shows that increasing work limitations by one percent leads SSI and SSI child programs participation to increase by 93.63 percent and 58.73 percent, respectively. I estimate the negative and statistically significant coefficients between premium and work limitations for the interaction term. These results suggest that if the cost of premium increases for people who reported having work limitations, they are 0.106 and 0.057 percent less likely to apply for the SSI and SSI child programs, respectively. These negative coefficients explain that many individuals with disabilities can remain or return to work with some capability (Autor et al. 2020). I also calculate that due to this interaction, if the cost of premium increases by one unit, the program's participation increases by 0.009 units and 0.005 units for SSI and SSI child, respectively.

Table 10: Heterogeneity test - Interaction with % work limitations.

	(1) SSI	(2) SSI Child
Premium for one individual aged 30 and 2 children	0.009***	0.005***
	(0.003)	(0.002)
Percent work limitations	93.631*	58.727**
	(48.379)	(21.978)
Premium for one individual aged 30 and 2 children*% work limitations	-0.106**	-0.057***
	(0.046)	(0.020)
Observations	255	255
R-squared	0.984	0.985
Controls	Yes	Yes
State Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes

Notes: *** p<0.01, ** p<0.05, and * p<0.1 indicate levels of significance. Each cell represents a separate regression based on 255 state-year observations. Outcomes are measured per 10,000 population. Controls include the state expanded Medicaid, the unemployment rate, the poverty ratio (fraction of the population below the FPL), the percentage of the population reported any difficulty, the percentage of the population with work limitations, the fraction of the population by race/ethnicity, the fraction of population ages (27-64), by gender (female or male), and fraction with a high school diploma. All regressions include state-fixed and year-fixed effects with standard errors clustered at the state level and reported in parentheses.

Table B12 reports the results using the GRA-level data and the interaction between the premium for an individual-aged-30-and-two-children health plan and the percentage of the population with work limitations. It demonstrates that if the premium cost increases, people who reported having work limitations are 0.341 percent more likely to apply for the SSI program. The explanation for getting this positive coefficient is similar to the positive coefficient I found by taking the interaction between the premium of a 30-year-old-with-2-children health plan and the percentage of the population that reported any difficulty.

I find a similar impact of the average premium of a 30-year-old-with-two-children health plan on SSI and SSI child participation using the state-level data. The main model's coefficients are not statistically significant and can be rejected by five percent of either direction. I hypothesize that if the cost of premiums increases, people with disabilities will intend to achieve health insurance through SSI and SSI child programs. No statistically significant results provide evidence for my hypothesis. The coefficients for Medicaid expansion from all specifications indicate that it does not have any economically meaningful impact on the applications of SSI and SSI child at the state level, as reported in Table A4, and SSI applications at the GRA level reported in Table B5. The results are consistent with the result found in the previous study (Schmidt et al. 2020). The coefficients for the unemployment rate from all specifications indicate that it increases the applications of SSI and SSI child at the state level reported in Table A4. If the unemployment rate increases by one unit, the SSI and SSI child programs participation increases by 1.66 and 0.92 units, respectively. These results are consistent with two earlier studies (Nichols et al. 2017; Rupp 2012).

The R-squared is very high in all regressions. This could result from state- and year-fixed effects and GRA- and year-fixed effects. The omitted variable bias problem is evident in this study, as I do not include all relevant variables in the models. Overall, the state-level and GRA-level subgroup analyses are stable with some covariates such as unemployment rate, poverty ratio, and a high school diploma. Surprisingly, work limitations provide the opposite direction of the coefficients for state-level subgroup analyses compared to GRA-level subgroup analyses.

7. Discussion

In this project, I aim to look at the effect of the premium of a 30-year-old-with-two-children health plan on disability claiming. Using state-level publicly available data, I do not find any significant relationship between the premium of a 30-year-old-with-two-children health plan and SSI and SSI child applications per 10,000 population. I also find no significant relationship between the premium of a 30-year-old-with-two-children health plan and SSI applications per 10,000 population at the GRA level using the restricted version of county-level data converted for the GRA-level analyses. In other words, the estimates suggest that an increase in premium leads to small and not statistically significant increases in the SSI and SSI child programs participation at the state level and SSI program participation at the GRA level. Additionally, I run some robustness checks and find no significant impacts from changes in the prices of the other health plans in the HIX Compare data on the disability claiming.

However, I find heterogeneous impacts of premium of a 30-year-old-with-two-children health plan on the decline in SSI participation across different subgroup populations by taking the interaction between that premium variable and covariates, such as unemployment rate, poverty ratio, and high school diploma in both state and GRA levels. Initially, I assumed that increasing the unemployment rate would increase SSI program participation, but the interaction suggests a negative relationship. This result is in line with Nichols et al. (2017), which found that SSI applications and unemployment rates are negatively associated because of the characteristics of a person whose unemployment spell begins when the unemployment rates are relatively high. In other words, when unemployment rates are low, only the least employable are unemployed. This mechanism implies that the negative coefficients for the subgroups in states with higher unemployment rates and poverty ratios could arise because eligible people (with disabilities and low incomes) may already have enrolled in the SSI program prior to the premium increases, i.e., few individuals remain on the margin of opting into SSI. The robustness checks using the interaction between the premium of a 30-year-old-with-two-children health plan and the percentage of Medicaid and SSI recipiency support my explanation, that new applications will be lower in states where more of the population with disabilities and low incomes is already accessing public assistance.

The explanation for the negative coefficient for the fraction with a high school diploma is that education increases the chance of getting employed and earning a higher salary. My robustness check using the fraction with a college degree supports that education helps individuals to not be dependent on the disability program. One study observed that postsecondary education improved employment and weekly earnings and reduced dependency on SSI benefits (Sannicandro et al. 2018). Poterba et al. (2015) studied the negative relationship between education and DI participation rate. They suggested that a higher level of education provides better health, decreasing DI claim rates.

Heterogeneous analyses using the state-level data show negative and statistically significant coefficients from taking the interaction between the premium of a 30-year-old-with-two-children health plan and the percentage of the population with work limitations at the state level, which generally lines up with the results for the unemployment rate, poverty ratio, and public assistance recipiency rates, i.e., these factors are indicative of a smaller remaining population on the margin between applying for disability or not. However, heterogeneity analyses using the GRA-level data show a marginally statistically significant positive coefficient effect from changes in the premium of a 30-year-old-with-two-children health plan on SSI participation in GRAs with a higher percentage of whites or individuals reporting any difficulty or work limitation.

Possible explanations for the differences across the two data sources include that the GRA-level data have more variation than the state-level data but include both SSI and SSI child applications. Imputation may also be introducing significant noise, counteracting the benefits of the more granular data at the GRA level.

The results for Medicaid expansion are consistent with the previous literature, which found no significant effects of health insurance programs such as ACA Medicaid expansion and CHIP on disability applications (Schmidt et al. 2020; Levere et al. 2019). Subgroup analyses from the GRA-level data provide the big-picture idea that if the cost of premium of a 30-year-old-with-two-children health plan increases, whites, people who reported any difficulty, and those with work limitations are more likely to switch to the SSI program.

This study has some limitations. First, this study does not examine the month-level variation of the price changes in the premium of a 30-year-old-with-two-children health plan and SSI applications because of a discrepancy in the dates, though they are available in both HIX Compare with SAMWD data or restricted data. Second, I only consider the premium of a 30-year-old-with-two-children health plan in my main analysis. Because I assume that this health plan could most likely impact the SSI Child program, another reason is that all health plans are moving together, causing multicollinearity. So, I removed all other plans and used the premium of a 30-year-old-with-two-children health plan. Third, the project suffers from omitted variable bias problem, as I do not include all relevant variables in the models.

Despite the absence of an association between ACA marketplace plans and disability programs from the preferred model, I have added to the literature on the negative relationship between these two programs among some vulnerable subgroup populations. The potential mechanism can be that those vulnerable populations have already entered the disability program's system; therefore, very few people are left on the margin to apply for the disability program.

8. Conclusion

The ACA provides all individuals health insurance coverage through Medicaid, Medicare, and other buying options through health insurance marketplaces regardless of disability or parental status. Individuals who receive SSI benefits can switch to an SSI program if they cannot afford low-cost health insurance through marketplaces. This could lead to the substitute effects between ACA marketplaces and SSI programs. I examined the effect of the premium of a 30-year-old-with-two-children health insurance plan on SSI program participation. I found that states and GRAs with an average premium one standard deviation above the mean experienced an increase in SSI and SSI child applications and SSI applications, respectively. The results appear to reject the reasonably relevant effect of the premium of a 30-year-old-with-two-children health plan on SSI program participation in either direction of the confidence intervals.

I ran heterogeneous analyses and found evidence that certain subgroup populations do not switch to SSI programs if the cost of premium of a 30-year-old-with-two-children health plan increases, such as populations living in states or GRA where there is higher unemployment rate, poverty ratios, and a high school diploma, and populations living in states where there is higher percentage of work limitations. I also found evidence that populations that are living in the GRAs, where there is a higher percentage of the white population, reported difficulty, and work limitations, shift to SSI programs if the cost of the premium of a 30-year-old-with-two-children health plan increases.

The state-level results provide the implication for policymakers that insurers may be targeting people who are not likely to apply for the disability programs, as these individuals are not likely to be eligible for SSI. Therefore, it may have more price in elastic demand for health insurance for persons that the insurers are aiming. Another possibility is that access to health insurance could improve health, leading to lower rates of disability in the future and, thus, lower applications. In other words, new applications will be lower for individuals who are already receiving SSI benefits in the states where more of the population is already accessing public assistance. So, insurers could focus on raising prices where fewer people are likely to be eligible for public assistance and where economies are healthier. In conclusion, a decrease in disability applications, apparently, will decrease costs to the SSA.

References

Abraham, J., C. Drake, D.W Sacks, and K. Simon. 2017. "Demand for Health Insurance Marketplace Plans was Highly Elastic in 2014–2015." *Economics Letters* 159: 69-73. https://doi.org/10.1016/j.econlet.2017.07.002.

Anand, P., J.S Hyde, M. Colby, and P. O'Leary. 2018. "The Impact of Affordable Care Act Medicaid Expansions on Applications to Federal Disability Programs." *Forum for Health Economics and Policy* 21(2): 20180001. https://doi.org/10.1515/fhep-2018-0001.

Anderson, D., J.M Abraham, and C. Drake. 2019. "Rural-urban Differences in Individual-Market Health Plan Affordability after Subsidy Payment Cuts." *Health Affairs* 38(12): 2032-2040. https://doi.org/10.1377/hlthaff.2019.00917.

Autor, D. H., and M.G Duggan. 2003. "The Rise in the Disability Rolls and the Decline in Unemployment." *The Quarterly Journal of Economics* 118(1): 157-206. https://doi.org/10.1162/00335530360535171.

Autor, D., N. Maestas, and R. Woodbury. 2020. "Disability policy, program enrollment, work, and well-being among people with disabilities." *Soc. Sec. Bull.* 80: 57.

Baicker, K., A. Finkelstein, J. Song, and S. Taubman. 2014. "The Impact of Medicaid on Labor Market Activity and Program Participation: Evidence from the Oregon Health Insurance Experiment." *American Economic Review* 104(5): 322-28. http://dx.doi.org/10.1257/aer.104.5.322.

Berry, H. G., M. Ward, and L. Caplan. 2012. "Self-determination and access to postsecondary education in transitioning youths receiving supplemental security income benefits." *Career Development and Transition for Exceptional Individuals* 35(2): 68-75. https://doi.org/10.1177/0885728811422230.

Black, D., K. Daniel, K., and S. Sanders. 2002. "The Impact of Economic Conditions on Participation in Disability Programs: Evidence from the Coal Boom and Bust." *American Economic Review* 92(1): 27-50. https://doi.org/10.1257/000282802760015595.

Blundell, R., V. Fry, and I. Walker. 1988. "Modelling the take-up of means-tested benefits: the case of housing benefits in the United Kingdom." *The economic journal* 98(390): 58-74. https://doi.org/10.2307/2233304.

Boozary, A. S., Y. Feyman, U.E Reinhardt, and A.K Jha. 2019. "The Association between Hospital Concentration and Insurance Premiums in ACA Marketplaces." *Health Affairs* 38(4): 668-674. https://doi.org/10.1377/hlthaff.2018.05491.

Burns, M., and L. Dague. 2017. "The Effect of Expanding Medicaid Eligibility on Supplemental Security Income Program Participation." *Journal of Public Economics* 149: 20-34. https://doi.org/10.1016/j.jpubeco.2017.03.004.

Cox, C., L. Levitt, A. Damico, and G. Claxton 2011. “Mapping premium variation in the individual market.” *Kaiser Family Foundation* 8214.

Currie, J. 2004. “The take up of social benefits.” *NBER Working Paper* No. 10488. http://www.nber.org/papers/w10488.

Daly, M., and R.V Burkhauser. 2003. “The Supplemental Security Income Program.” In *Means-Tested Transfer Programs in the United States*, pp. 79-140. University of Chicago Press. https://www.nber.org/system/files/chapters/c10255/c10255.pdf.

Deshpande, M., and Y. Li. 2019. “Who is screened out? Application costs and the targeting of disability programs.” *American Economic Journal: Economic Policy* 11(4): 213-48. https://www.jstor.org/stable/26817918.

Dillender, M. 2016. “The Potential Effects of the Affordable Care Act on Disability Insurance and Workers’ Compensation.” In *The Economics of Health*, pp. 81-102. W.E. Upjohn Institute for Employment Research. https://doi.org/10.17848/9780880994644/ch5

Foote, A., M. Grosz, and S. Rennane. 2019. “The Effect of Lower Transaction Costs on Social Security Disability Insurance Application Rates and Participation.” *Journal of Policy Analysis and Management* 38(1): 99-123. https://doi.org/10.1002/pam.22095.

Kaiser Family Foundation. 2022. “State Health Insurance Marketplace Types, 2022.”

Kennedy, J., and E. Blodgett. 2012. “Health insurance–motivated disability enrollment and the ACA.” *New England Journal of Medicine*, 367(12): e16. https://www.nejm.org/doi/full/10.1056/NEJMp1208212.

Levere, M., S. Orzol, L. Leininger, and N. Early. 2019. “Contemporaneous and long-term effects of children’s public health insurance expansions on Supplemental Security Income participation.” *Journal of health economics*, 64: 80-92. https://doi.org/10.1016/j.jhealeco.2019.02.003.

Levere, M., H. Hock, and N. Early. 2021. “How Does Losing Health Insurance Affect Disability Claims? Evidence from the Affordable Care Act's Dependent Care Mandate.” *Health Economics*, 30(5): 932-950. https://doi.org/10.1002/hec.4226.

Levitt, L., R. Fehr, G. Claxton, C. Cox, and K. Pollitz. 2018. “Why do Short-Term Health Insurance Plans Have Lower Premiums than Plans that Comply with the ACA?” Kaiser Family Foundation.

Li, Y. 2015. “The Affordable Care Act in an Economy with Federal Disability Insurance.” Tech. rep. SUNY at Albany. Accessed October 27, 2020. http://econ.hunter.cuny.edu/wp-content/uploads/2014/09/ACA_Disability_2.pdf.

Maclean, J. C., K.M Ghimire, and L.H Nicholas. 2019. “Medical Marijuana Laws and Disability Applications, Receipts, and Terminations.” In *National Bureau of Economic Research Working Paper No. 23862*.

Maclean, J. C., K.M Ghimire, and L.H Nicholas. 2021. “Marijuana legalization and disability claiming.” *Health Economics* 30(2): 453-469. https://doi.org/10.1002/hec.4190.

Maestas, N., K.J Mullen, and A. Strand. 2014. “Disability Insurance and Health Insurance Reform: Evidence from Massachusetts.” *American Economic Review* 104(5): 329-35. https://www.aeaweb.org/articles?id=10.1257/aer.104.5.329.

Meyer, B. D., and W.K Mok. 2014. “Disabled women and their economic well-being.” In *Second Annual Meeting of the Disability Research Consortium, October* 30-31.

Moffitt, R. 1983. “An economic model of welfare stigma.” *The American Economic Review* 73(5): 1023-1035. https://www.jstor.org/stable/1814669.

Moffitt, R. 1992. “Incentive effects of the US welfare system: A review.” *Journal of Economic Literature* 30(1): 1-61. https://www.jstor.org/stable/2727878.

Nadel, M., S. Wamhoff, and M. Wiseman, M. 2003. “Disability, Welfare Reform, and Supplemental Security Income.” *Social Security Bulletin* 65(3).

National Center for Health Statistics. “Vintage 2020 postcensal estimates of the resident population of the United States (April 1, 2010, July 1, 2010-July 1, 2020), by year, county, single-year of age (0, 1, 2, .., 85 years and over), bridged race, Hispanic origin, and sex.” Prepared under a collaborative arrangement with the U.S. Census Bureau. Available from: /nchs/nvss/bridged_race.htm as of September 22, 2021, following release by the U.S. Census Bureau of the unbridged Vintage 2020 postcensal estimates by 5-year age group on June 17, 2021.

Nichols, A., L. Schmidt, and P. Sevak. 2017. “Economic conditions and supplemental security income application.” *Soc. Sec. Bull.* 77: 27.

Poterba, J., S. Venti, S., and D. Wise. 2015. “The Long Reach of Education: Health, Wealth, and Disability Insurance Participation”. National Bureau of Economic Research. No. odrc15-01.

Robert Wood Johnson Foundation. 2020. “Health Insurance Plans Datasets.” Accessed November 12, 2020. https://hixcompare.org/individual-markets.html.

Rupp, K. 2012. “Factors affecting initial disability allowance rates for the disability insurance and supplemental security income programs: the role of the demographic and diagnostic composition of applicants and local labor market conditions.” *Soc. Sec. Bull.* 72 *(4)*: 11-35. https://heinonline.org/HOL/P?h=hein.journals/ssbul72&i=363.

Rupp, K., and D. Stapleton. 1995. “Determinants of the growth in the Social Security Administration's disability programs-an overview.” *Soc. Sec. Bull.* 58: 43-70. https://heinonline.org/HOL/P?h=hein.journals/ssbul58&i=417.

Sannicandro, T., S.L Parish, S. Fournier, M. Mitra, and M. Paiewonsky. 2018. “Employment, income, and SSI effects of postsecondary education for people with intellectual disability." *American journal on intellectual and developmental disabilities* 123(5): 412-425. https://doi.org/10.1352/1944-7558-123.5.412.

Schmidt, L. 2012. "The Supplemental Security Income Program and Welfare Reform." FRB of Boston Public Policy Discussion Paper: 12-3. http://hdl.handle.net/10419/99115.

Schmidt, L., L.D Shore-Sheppard, and T. Watson T. 2020. "The Impact of the ACA Medicaid Expansion on Disability Program Applications." *American Journal of Health Economics* 6(4): 444-476. https://doi.org/10.1086/710525.

Scott, C. G. (1999). "Identifying the race or ethnicity of SSI recipients." *Soc. Sec. Bull.* 62: 9.

Sen, A. P., and T. DeLeire. 2018. "How does expansion of public health insurance affect risk pools and premiums in the market for private health insurance? Evidence from Medicaid and the Affordable Care Act Marketplaces." *Health Economics* 27(12): 1877-1903. https://doi.org/10.1002/hec.3809.

Social Security Administration. 2019. "Trends in Social Security Disability Insurance." *Briefing paper*: 2019-01, 2. https://www.ssa.gov/policy/docs/briefing-papers/bp2019-01.html.

Social Security Administration. 2020. "Annual Report of the Supplemental Security Income Program." *Washington, DC: SSA*. https://www.ssa.gov/oact/ssir/SSI20/ssi2020.pdf.

Stith, S. S. 2022. "Effects of work requirements for food assistance eligibility on disability claiming." *IZA Journal of Labor Economics* 11(1). https://doi.org/10.2478/izajole-2022-0002.

University of Kentucky Center for Poverty Research. 2021. "UKCPR National Welfare Data, 1980-2019." Accessed November 2, 2021. http://ukcpr.org/resources/national-welfare-data.

Wamhoff, S., and M. Wiseman. 2005. "The TANF/SSI Connection." *Soc. Sec. Bull.* 66: 21.

Yelowitz, A. S. 1998. "Why did the SSI-disabled program grow so much? Disentangling the effect of Medicaid." *Journal of Health Economics* 17(3): 321-349. https://doi.org/10.1016/S0167-6296(97)00024-6.

Appendix: Figures and Tables

Appendix A

Table A1: Correlation matrix.

Panel A	(1)	(2)	(3)	(4)	(5)
(1) SSI Applications per 10,000	1.000				
(2) Premium for an individual aged 27	-0.212	1.000			
(3) Premium for an individual aged 50	-0.173	0.890	1.000		
(4) Premium for one individual aged 30 and 2 children	-0.202	0.935	0.974	1.000	
(5) Premium for two individuals aged 30 and 2 children	-0.205	0.969	0.961	0.993	1.000
Panel B					
(1) SSI Child Applications per 10,000	1.000				
(2) Premium for an individual aged 27	-0.209	1.000			
(3) Premium for an individual aged 50	-0.164	0.890	1.000		
(4) Premium for one individual aged 30 and 2 children	-0.194	0.935	0.974	1.000	
(5) Premium for two individuals aged 30 and 2 children	-0.198	0.969	0.961	0.993	1.000

Table A2: Descriptive Statistics for control variables at State-Year level.

	Mean	Std.	Min	Max
Medicaid Expansion	0.63	0.48	0.00	1.00
Unemployment rate	4.26	1.07	2.40	6.90
Poverty ratio	0.13	0.03	0.06	0.23
Percent reporting any difficulty	0.09	0.02	0.06	0.15
Percent work limitation	0.07	0.02	0.04	0.13
Fraction Prime population ages 27-64	0.49	0.02	0.42	0.56
Sex Ratio (Female to Male)	0.51	0.01	0.48	0.55
Fraction with High School Diploma	0.21	0.03	0.13	0.31
Fraction Non-Hispanic white	0.65	0.17	0.16	0.94
Fraction Non-Hispanic Black	0.12	0.11	0.00	0.49
Fraction Hispanic	0.15	0.12	0.01	0.55
Observations	255			

Notes: Data cover the period from 2015-2019. All covariates listed except Medicaid expansion are from UKCPR and CPS.

Table A3: Summary statistics: between vs. within

		Mean	Std. Dev.	Min	Max	Observations
SSI Applications per 10,000	Overall	29.08	11.32	10.85	65.58	N= 255
	Between		11.15	12.38	62.72	n = 51
	within		2.38	22.11	39.38	T= 5
SSI Child Applications per 10, 000	Overall	10.85	5.50	2.58	30.24	N= 255
	Between		5.44	2.76	27.80	n = 51
	within		1.07	6.27	15.15	T= 5
Premium of 30-year-old with 2 children	Overall	852.58	247.66	419.31	1683.27	N= 255
	Between		136.25	638.44	1395.56	n = 51
	within		207.52	481.10	1291.98	T= 5

Table A4: Regression Results - SSI and SSI Child Applications per 10,000 population.

	(1) SSI	(2) SSI Child
Premium for one individual aged 30 and 2 children	0.004	0.005
	(0.005)	(0.003)
Premium for one individual aged 30 and 2 children^2	-0.000	-0.000
	(0.000)	(0.000)
Sex Ratio (Female to Male)	15.331	12.736
	(21.701)	(9.512)
Fraction with High School Diploma	-3.105	1.246
	(15.845)	(6.508)
Fraction Non-Hispanic white	-9.621	-3.345
	(19.819)	(7.716)
Fraction Non-Hispanic Black	-6.243	3.511
	(20.219)	(8.479)
Fraction Hispanic	-0.569	-6.847
	(19.727)	(7.849)
Fraction Prime population ages 27-64	35.923	2.854
	(23.089)	(7.769)
Poverty ratio	15.568	6.552
	(13.576)	(4.871)
Percent reported any difficulty	8.780	0.310
	(28.153)	(13.603)
Percent work limitations	8.232	14.192
	(28.729)	(12.346)
Medicaid Expansion	-0.434	-0.807
	(0.913)	(0.703)
Unemployment rate	1.656***	0.922***
	(0.527)	(0.162)
Observations	255	255
R-squared	0.983	0.984
Controls	Yes	Yes
State Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes

Notes: *** p<0.01, ** p<0.05, and * p<0.1 indicate levels of significance. Each cell represents a separate regression based on 255 state-year observations. Outcomes are measured per 10,000 population. Controls include the state expanded Medicaid, the unemployment rate, and the poverty ratio (fraction of the population below the FPL, percentage of population reported any difficulty, percentage of population with work limitations, fraction of population by race/ethnicity, fraction of population ages (27-64), by gender (female or male), and fraction with high school diploma. All regressions include state and year fixed effects with standard errors clustered at the state level and reported in parentheses.

Table A5: Robustness checks - SSI Applications per 10,000 population.

	(1) SSI	(2) SSI	(3) SSI
Premium for an individual aged 27	0.004		
	(0.004)		
Premium for an individual aged 50		0.002	
		(0.002)	
Premium for two individuals aged 30 and 2 children			0.001
			(0.001)
Observations	255	255	255
R-squared	0.983	0.983	0.983
Controls	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes

Notes: *** p<0.01, ** p<0.05, and * p<0.1 indicate levels of significance. Each cell represents a separate regression based on 255 state-year observations. Outcomes are measured per 10,000 population. Controls include the state expanded Medicaid, the unemployment rate, the poverty ratio (fraction of the population below the FPL), the percentage of the population reported any difficulty, the percentage of the population with work limitations, the fraction of the population by race/ethnicity, the fraction of population ages (27-64), by gender (female or male), and fraction with a high school diploma. All regressions include state-fixed and year-fixed effects with standard errors clustered at the state level and reported in parentheses.

Table A6: Robustness checks - SSI Child Applications per 10, 000 population.

	(1) SSI Child	(2) SSI Child	(3) SSI Child
Premium for an individual aged 27	0.002		
	(0.002)		
Premium for an individual aged 50		0.001	
		(0.001)	
Premium for two individuals aged 30 and 2 children			0.001
			(0.001)
Observations	255	255	255
R-squared	0.984	0.984	0.984
Controls	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes

Notes: *** p<0.01, ** p<0.05, and * p<0.1 indicate levels of significance. Each cell represents a separate regression based on 255 state-year observations. Outcomes are measured per 10,000 population. Controls include the state expanded Medicaid, the unemployment rate, the poverty ratio (fraction of the population below the FPL), the percentage of the population reported any difficulty, the percentage of the population with work limitations, the fraction of the population by race/ethnicity, the fraction of population ages (27-64), by gender (female or male), and fraction with a high school diploma. All regressions include state-fixed and year-fixed effects with standard errors clustered at the state level and reported in parentheses.

Appendix B

Table B1: Descriptive Statistics for GRA-Year level from imputation methods.

Panel A (Imputation method 1)	Mean	Std.	Min	Max
SSI application per 10,000 (1-9)	105.89	281.65	3.37	5155.89
Premium for one individual age 30 and 2 children	873.38	260.26	419.31	2133.81
Observations	2489			
Panel B (Imputation method 2)				
SSI application per 10,000 (5)	105.96	282.07	3.23	5150.73
Premium for one individual age 30 and 2 children	873.38	260.26	419.31	2133.81
Observations	2489			
Panel C (Imputation method 3)				
SSI application per 10,000 (no imputation)	43.85	252.50	0.00	5209.11
Premium for one individual age 30 and 2 children	803.31	230.72	419.31	1740.89
Observations	1470			

Notes: Data cover the period from 2015-2019. SSI applications are from restricted version of administrative claims data from the Social Security Administration. Independent variable is listed from HIX Compare. Population is from National Center Health Statistics. Imputation method 1: Missing values are imputed by a random number between 1 and 9 for the SSI applications. Imputation method 2: Missing values are imputed by 5 for the SSI applications. Imputation method 3: Missing values are dropped from the SSI applications.

Table B2: Descriptive Statistics for GRA-Year level merged with CPS from imputation methods.

Panel A (Imputation method 1)	Mean	Std.	Min	Max
SSI application per 10,000 (1-9)	103.26	342.48	14.52	4518.98
Premium for one individual aged 30 and 2 children	830.09	233.29	419.31	1565.98
Sex Ratio (Female to Male)	0.51	0.04	0.00	1.00
Fraction with High School Diploma	0.21	0.07	0.00	1.00
Fraction Non-Hispanic white	0.63	0.22	0.00	1.00
Fraction Non-Hispanic Black	0.11	0.11	0.00	0.61
Fraction Hispanic	0.19	0.20	0.00	0.99
Fraction Prime population ages 27-64	0.51	0.05	0.00	0.73
Poverty ratio	0.13	0.08	0.00	1.00
Percent reported any difficulty	0.09	0.05	0.00	1.00
Percent work limitations	0.07	0.04	0.00	0.50
Unemployment Rate	4.54	1.66	2.10	21.80
Medicaid Expansion	0.60	0.49	0.00	1.00
Observations	877			
Panel B (Imputation method 2)				
SSI application per 10,000 (5)	103.25	342.49	14.43	4514.76
Premium for one individual age 30 and 2 children	830.09	233.29	419.31	1565.98
Sex Ratio (Female to Male)	0.51	0.04	0.00	1.00
Fraction with High School Diploma	0.21	0.07	0.00	1.00
Fraction Non-Hispanic white	0.63	0.22	0.00	1.00
Fraction Non-Hispanic Black	0.11	0.11	0.00	0.61
Fraction Hispanic	0.19	0.20	0.00	0.99
Fraction Prime population ages 27-64	0.51	0.05	0.00	0.73
Poverty ratio	0.13	0.08	0.00	1.00
Percent reported any difficulty	0.09	0.05	0.00	1.00
Percent work limitations	0.07	0.04	0.00	0.50
Unemployment Rate	4.54	1.66	2.10	21.80
Medicaid Expansion	0.60	0.49	0.00	1.00
Observations	877			
Panel C (Imputation method 3)				
SSI application per 10,000 (1-9)	65.73	372.77	0.00	5209.11
Premium for one individual aged 30 and 2 children	831.98	235.43	419.31	1565.98
Sex Ratio (Female to Male)	0.51	0.04	0.00	1.00
Fraction with High School Diploma	0.21	0.07	0.00	1.00
Fraction Non-Hispanic white	0.62	0.22	0.00	1.00
Fraction Non-Hispanic Black	0.12	0.11	0.00	0.61
Fraction Hispanic	0.19	0.20	0.00	0.99
Fraction Prime population ages 27-64	0.51	0.05	0.00	0.73
Poverty ratio	0.13	0.08	0.00	1.00
Percent reported any difficulty	0.09	0.05	0.00	1.00
Percent work limitations	0.07	0.04	0.00	0.50
Unemployment Rate	4.60	1.69	2.10	21.80
Medicaid Expansion	0.60	0.49	0.00	1.00
Observations	802			

Notes: Data cover the period from 2015-2019. SSI applications are from restricted version of administrative claims data from the Social Security Administration. Independent variable, Premium of health plan of 30-year-old and two children, is listed from HIX Compare. Population is from National Center Health Statistics. Socio-demographic characteristics are listed from CPS expect unemployment rate and Medicaid Expansion. Imputation method 1: Missing values are imputed by a random number between 1 and 9 for the SSI applications. Imputation method 2: Missing values are imputed by 5 for the SSI applications. Imputation method 3: Missing values are dropped from the SSI applications.

Table B3: Regression Results - SSI Applications from imputation methods with no controls.

	(1) SSI	(2) SSI	(3) SSI
Premium for one individual aged 30 and 2 children	-0.063***	-0.063***	-0.078***
	(0.022)	(0.022)	(0.028)
Constant	161.266***	160.981***	106.479***
	(19.742)	(19.772)	(23.811)
Observations	2,489	2,489	1,470
R-squared	0.003	0.003	0.005

Notes: *** p<0.01, ** p<0.05, and * p<0.1 indicates level of significance. Each cell represents a separate regression based on GRA-year observations. All regressions do not include any controls and fixed effects. Imputation method 1: Missing values are imputed by a random number between 1 and 9 for the SSI applications for column 1. Imputation method 2: Missing values are imputed by 5 for the SSI applications for column 2. Imputation method 3: Missing values are dropped from the SSI applications. SSI applications are adjusted by population per 10,000.

Table B4: Regression Results - SSI Applications from imputation methods with fixed effects.

	(1) SSI	(2) SSI	(3) SSI
Premium for one individual aged 30 and 2 children	0.015	0.016	0.016
	(0.011)	(0.011)	(0.012)
Observations	2,489	2,489	1,470
R-squared	0.987	0.987	0.992
GRA Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes

Notes: *** p<0.01, ** p<0.05, and * p<0.1 indicates level of significance. Each cell represents a separate regression based on GRA-year observations. All regressions include GRA and year fixed effects with standard errors clustered at the GRA level and reported in parentheses. Imputation method 1: Missing values are imputed by a random number between 1 and 9 for the SSI applications for column 1. Imputation method 2: Missing values are imputed by 5 for the SSI applications for column 2. Imputation method 3: Missing values are dropped from the SSI applications. SSI applications are adjusted by population per 10,000.

Table B5: Regression Results - SSI Applications from imputation methods with controls.

	(1) SSI	(2) SSI	(3) SSI
Premium for one individual aged 30 and 2 children	0.021	0.021	0.029
	(0.026)	(0.026)	(0.034)
Sex Ratio (Female to Male)	-33.795	-32.173	-82.770
	(32.579)	(31.750)	(79.393)
Fraction with High School Diploma	1.367	0.749	19.729
	(11.946)	(11.399)	(31.083)
Fraction Non-Hispanic white	-34.278	-33.816	-9.621
	(22.267)	(21.576)	(44.587)
Fraction Non-Hispanic Black	-33.586	-32.848	-17.980
	(22.220)	(21.334)	(37.869)
Fraction Hispanic	-29.773	-28.726	-5.057
	(21.214)	(20.247)	(44.363)
Fraction Prime population ages 27-64	-5.848	-4.730	19.301
	(18.510)	(17.081)	(30.132)
Poverty ratio	3.747	3.053	5.507
	(5.608)	(5.486)	(18.628)
Percent reported any difficulty	-24.366	-23.257	1.099
	(22.119)	(21.581)	(52.076)
Percent work limitations	-14.889	-13.558	-28.848
	(24.720)	(24.158)	(92.302)
Unemployment Rate	10.269	10.261	8.467
	(7.787)	(7.687)	(10.442)
Medicaid Expansion	-2.052	-2.112	-15.492
	(2.229)	(2.167)	(13.566)
Observations	877	877	802
R-squared	0.996	0.997	0.993
Controls	Yes	Yes	Yes
GRA Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes

Notes: *** p<0.01, ** p<0.05, and * p<0.1 indicates level of significance. Each cell represents a separate regression based on GRA-year observations. All regressions include controls plus GRA and year fixed effects with standard errors clustered at the GRA level and reported in parentheses. Controls include sex, fraction with high school diploma, fraction by race/ethnicity, prime age 25-64, poverty ratio, and percentage of the population reporting any difficulty, percentage of the population with a work limitation, unemployment rate and Medicaid Expansion. Imputation method 1: Missing values are imputed by a random number between 1 and 9 for the SSI applications for column 1. Imputation method 2: Missing values are imputed by 5 for the SSI applications for column 2. Imputation method 3: Missing values are dropped from the SSI applications. SSI applications are adjusted by population per 10, 000.

Table B6: Heterogeneity test - Interaction with Medicaid Expansion from imputation methods.

	(1) SSI	(2) SSI	(3) SSI
Premium for one individual aged 30 and 2 children	0.021	0.021	0.032
	(0.028)	(0.027)	(0.036)
Medicaid Expansion	1.429	1.279	-6.359
	(7.123)	(6.982)	(15.350)
Premium for one individual aged 30 and 2 children*Medicaid Expansion	-0.004	-0.004	-0.010
	(0.009)	(0.009)	(0.012)
Observations	877	877	802
R-squared	0.996	0.997	0.993
Controls	Yes	Yes	Yes
GRA Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes

Notes: *** p<0.01, ** p<0.05, and * p<0.1 indicate levels of significance. Each cell represents a separate regression based on GRA-year observations. SSI applications are adjusted by population per 10,000. Imputation method 1: Missing values are imputed by a random number between 1 and 9 for the SSI applications for column 1. Imputation method 2: Missing values are imputed by 5 for the SSI applications for column 2. Imputation method 3: Missing values are dropped from the SSI applications. Controls include the state expanded Medicaid, the unemployment rate, and the poverty ratio (fraction of the population below the FPL), percentage of population reported any difficulty, percentage of population with work limitations, fraction of population by race/ethnicity, fraction of population ages (27-64), by gender (female or male), and fraction with high school diploma. All regressions include GRA and year fixed effects with standard errors clustered at the GRA level and reported in parentheses.

Table B7: Heterogeneity test - Interaction with unemployment rate from imputation methods.

	(1) SSI	(2) SSI	(3) SSI
Premium for one individual age 30 and 2 children	0.024	0.025	0.040
	(0.028)	(0.028)	(0.036)
Unemployment Rate	10.537	10.550	9.178
	(8.022)	(7.922)	(10.426)
Premium for one individual aged 30 and 2 children*Unemployment rate	-0.001	-0.001	-0.003**
	(0.002)	(0.002)	(0.001)
Observations	877	877	802
R-squared	0.996	0.997	0.993
Controls	Yes	Yes	Yes
GRA Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes

Notes: *** p<0.01, ** p<0.05, and * p<0.1 indicate levels of significance. Each cell represents a separate regression based on GRA-year observations. SSI applications are adjusted by population per 10,000. Imputation method 1: Missing values are imputed by a random number between 1 and 9 for the SSI applications for column 1. Imputation method 2: Missing values are imputed by 5 for the SSI applications for column 2. Imputation method 3: Missing values are dropped from the SSI applications. Controls include the state expanded Medicaid, the unemployment rate, and the poverty ratio (fraction of the population below the FPL), percentage of population reported any difficulty, percentage of population with work limitations, fraction of population by race/ethnicity, fraction of population ages (27-64), by gender (female or male), and fraction with high school diploma. All regressions include GRA and year fixed effects with standard errors clustered at the GRA level and reported in parentheses.

Table B8: Heterogeneity test - Interaction with poverty ratio from imputation methods.

	(1) SSI	(2) SSI	(3) SSI
Premium for one individual aged 30 and 2 children	0.027	0.027	0.029
	(0.027)	(0.026)	(0.035)
Poverty ratio	44.257*	44.655*	0.691
	(26.184)	(25.353)	(54.507)
Premium for one individual aged 30 and 2 children*Poverty ratio	-0.055*	-0.056*	0.006
	(0.032)	(0.031)	(0.062)
Observations	877	877	802
R-squared	0.996	0.997	0.993
Controls	Yes	Yes	Yes
GRA Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes

Notes: *** p<0.01, ** p<0.05, and * p<0.1 indicate levels of significance. Each cell represents a separate regression based on GRA-year observations. SSI applications are adjusted by population per 10,000. Imputation method 1: Missing values are imputed by a random number between 1 and 9 for the SSI applications for column 1. Imputation method 2: Missing values are imputed by 5 for the SSI applications for column 2. Imputation method 3: Missing values are dropped from the SSI applications. Controls include the state expanded Medicaid, the unemployment rate, and the poverty ratio (fraction of the population below the FPL), percentage of population reported any difficulty, percentage of population with work limitations, fraction of population by race/ethnicity, fraction of population ages (27-64), by gender (female or male), and fraction with high school diploma. All regressions include GRA and year fixed effects with standard errors clustered at the GRA level and reported in parentheses.

Table B9: Heterogeneity test - Interaction with fraction high school diploma from imputation methods.

	(1) SSI	(2) SSI	(3) SSI
Premium for one individual aged 30 and 2 children	0.030	0.030	0.030
	(0.029)	(0.029)	(0.049)
Fraction with High School Diploma	35.635	32.523	22.425
	(26.036)	(24.818)	(102.658)
Premium for one individual aged 30 and 2 children*High School Diploma	-0.043*	-0.040*	-0.003
	(0.025)	(0.024)	(0.106)
Observations	877	877	802
R-squared	0.996	0.997	0.993
Controls	Yes	Yes	Yes
GRA Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes

Notes: *** p<0.01, ** p<0.05, and * p<0.1 indicate levels of significance. Each cell represents a separate regression based on GRA-year observations. SSI applications are adjusted by population per 10,000. Imputation method 1: Missing values are imputed by a random number between 1 and 9 for the SSI applications for column 1. Imputation method 2: Missing values are imputed by 5 for the SSI applications for column 2. Imputation method 3: Missing values are dropped from the SSI applications. Controls include the state expanded Medicaid, the unemployment rate, and the poverty ratio (fraction of the population below the FPL), percentage of population reported any difficulty, percentage of population with work limitations, fraction of population by race/ethnicity, fraction of population ages (27-64), by gender (female or male), and fraction with high school diploma. All regressions include GRA and year fixed effects with standard errors clustered at the GRA level and reported in parentheses.

Table B10: Heterogeneity test - Interaction with whites from imputation methods.

	(1) SSI	(2) SSI	(3) SSI
Premium for one individual aged 30 and 2 children	0.011	0.011	-0.016
	(0.020)	(0.020)	(0.031)
Fraction Non-Hispanic white	-47.479	-47.404	-73.884
	(30.850)	(29.896)	(60.372)
Premium for one individual aged 30 and 2 children*White	0.015	0.016	0.071**
	(0.014)	(0.013)	(0.028)
Observations	877	877	802
R-squared	0.996	0.997	0.993
Controls	Yes	Yes	Yes
GRA Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes

Notes: *** p<0.01, ** p<0.05, and * p<0.1 indicate levels of significance. Each cell represents a separate regression based on GRA-year observations. SSI applications are adjusted by population per 10,000. Imputation method 1: Missing values are imputed by a random number between 1 and 9 for the SSI applications for column 1. Imputation method 2: Missing values are imputed by 5 for the SSI applications for column 2. Imputation method 3: Missing values are dropped from the SSI applications. Controls include the state expanded Medicaid, the unemployment rate, and the poverty ratio (fraction of the population below the FPL), percentage of population reported any difficulty, percentage of population with work limitations, fraction of population by race/ethnicity, fraction of population ages (27-64), by gender (female or male), and fraction with high school diploma. All regressions include GRA and year fixed effects with standard errors clustered at the GRA level and reported in parentheses.

Table B11: Heterogeneity test - Interaction with percent reported any difficulty from imputation methods.

	(1) SSI	(2) SSI	(3) SSI
Premium for one individual aged 30 and 2 children	0.020	0.020	0.002
	(0.021)	(0.021)	(0.031)
Percent reported any difficulty	-35.831	-31.859	-250.298*
	(67.103)	(65.747)	(149.829)
Premium for one individual aged 30 and 2 children*% reported any difficulty	0.013	0.010	0.280*
	(0.069)	(0.068)	(0.144)
Observations	877	877	802
R-squared	0.996	0.997	0.993
Controls	Yes	Yes	Yes
GRA Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes

Notes: *** p<0.01, ** p<0.05, and * p<0.1 indicate levels of significance. Each cell represents a separate regression based on GRA-year observations. SSI applications are adjusted by population per 10,000. Imputation method 1: Missing values are imputed by a random number between 1 and 9 for the SSI applications for column 1. Imputation method 2: Missing values are imputed by 5 for the SSI applications for column 2. Imputation method 3: Missing values are dropped from the SSI applications. Controls include the state expanded Medicaid, the unemployment rate, and the poverty ratio (fraction of the population below the FPL), percentage of population reported any difficulty, percentage of population with work limitations, fraction of population by race/ethnicity, fraction of population ages (27-64), by gender (female or male), and fraction with high school diploma. All regressions include GRA and year fixed effects with standard errors clustered at the GRA level and reported in parentheses.

Table B12: Heterogeneity test - Interaction with percent work limitations from imputation methods.

	(1) SSI	(2) SSI	(3) SSI
Premium for one individual aged 30 and 2 children	0.017	0.017	0.004
	(0.020)	(0.020)	(0.029)
Percent work limitations	-54.532	-49.241	-288.750
	(90.025)	(88.918)	(191.555)
Premium for one individual aged 30 and 2 children*% work limitations	0.052	0.047	0.341*
	(0.097)	(0.096)	(0.188)
Observations	877	877	802
R-squared	0.996	0.997	0.993
Controls	Yes	Yes	Yes
GRA Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes

Notes: *** p<0.01, ** p<0.05, and * p<0.1 indicate levels of significance. Each cell represents a separate regression based on GRA-year observations. SSI applications are adjusted by population per 10,000. Imputation method 1: Missing values are imputed by a random number between 1 and 9 for the SSI applications for column 1. Imputation method 2: Missing values are imputed by 5 for the SSI applications for column 2. Imputation method 3: Missing values are dropped from the SSI applications. Controls include the state expanded Medicaid, the unemployment rate, and the poverty ratio (fraction of the population below the FPL), percentage of population reported any difficulty, percentage of population with work limitations, fraction of population by race/ethnicity, fraction of population ages (27-64), by gender (female or male), and fraction with high school diploma. All regressions include GRA and year fixed effects with standard errors clustered at the GRA level and reported in parentheses.

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