Health Care Access and Disability Insurance Applications

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Abstract

This paper identifies a spillover from Community Health Center openings: reduced Social Security Disability Insurance applications. During the Great Recession, we find that the opening of a Community Health Center caused an immediate reduction in applications and a 7.9 percent reduction two years later. Rather than marginal applications that would have been denied, the decline is concentrated among applications that would have been allowed without the initial decision needing to be appealed. Further, the decline is concentrated among potential applicants with relatively high prior labor force attachment and earnings rather than the low-income population targeted by Community Health Centers. (JEL J14, I18, I38, H51 I11)

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1. Introduction

Social Security Disability Insurance (SSDI) is the main assistance program for individuals with disabilities in the United States that make gainful employment difficult or impossible. More than eight million individuals receive SSDI benefits today, resulting in program costs exceeding $10 billion USD per month (Social Security Administration, 2023). With concerns about the solvency of the U.S. Social Security program growing, a better understanding of what deters individuals from applying for SSDI and instead encourages them to stay in the workforce is of clear interest to policymakers.

Previous work on this issue has focused on the role of labor market conditions influencing SSDI's relative attractiveness as well as SSDI's interaction with changes to other social insurance programs, such as the expansion of Medicaid following the Affordable Care Act of 2014. In comparison, much less work has considered how access to health care, or lack thereof, impacts the decision to apply for SSDI. As the conferral of SSDI benefits is contingent on suffering from a health impairment, these two things are likely to be related – however, the effect of improving health care provisions on SSDI usage is ambiguous. Given that some of the medical impairments that have driven recent increases in SSDI rates in the United States may be relatively treatable, improved medical resources could reduce SSDI applications through rendering tolerable conditions that formerly made working impossible. At the same time, a successful SSDI application requires convincing documentation of medical conditions, so increased access to health care providers may better enable disabled individuals to obtain such evidence and navigate the application process, thereby alleviating problems of incomplete program take-up.

In this paper, we study the effect of increased health care access on both the quantity and evidentiary content of SSDI applications by leveraging the expansion of the United States' Community Health Center (CHC) program. The CHC program is the dominant model in the U.S. for providing low-cost health care to uninsured and/or underprivileged populations. While the program was founded as part of Lyndon Johnson's War on Poverty Initiative and has been continually growing since, the program saw a marked expansion in the 2000s under both George W. Bush and Barack Obama. This, along with the fact that the targeted population of the CHC program is one that may be especially prone to applying for SSDI, makes the program a particularly relevant health care access initiative for our research question. We focus our analysis on the expansion of the program over the years 2007-2013. This is during and after the Great

Recession, which is an especially germane period, as it saw a more than doubling of individuals applying for SSDI in response to worsening economic conditions (Maestas et al., 2021).

We combine our data on the expansion of CHCs with the universe of SSDI applications, taken from the Social Security Administration's 831 files. In addition to containing information on the underlying health conditions that led to SSDI applications and their outcomes, these data contain rich information on the content of the applications themselves, including covariates that document whether disability examiners needed to obtain additional information on applicants to determine their eligibility. Using a stacked event-study specification, we find that the introduction of a health center causes a reduction of roughly 30 SSDI applications per million individuals at the ZIP-month level two years after establishment, with particularly strong effects for applications arising from disorders of the skeletal spine and depressive/bipolar disorders. On a basis of roughly 400 monthly applications per million, this constitutes a 7.9 percent reduction in application volume. However, we find little evidence that the health centers improved application documentation: we estimate precise null effects of CHCs on the proportion of applications that do not require additional evidence for determination. We also find no evidence that health centers improve the speed with which disabled individuals can submit SSDI applications or the speed in which they can be processed. Overall, our findings suggest that improved health care access can meaningfully deter SSDI applications through improving the health of potential applicants but also that health care access alone is insufficient in helping applicants navigate the SSDI application process more effectively.

Related Literature

Our paper contributes to several strands of economic literature, the first being work studying the determinants of participation in SSDI. One strain of literature examines the impact of labor-supply incentives, employment shocks, and business cycles.[1] Another strain studies the effects of long-run demographic trends, including changes in the labor force participation of women and the aging of the baby boomers (for a summary, see Liebman, 2015). Other studies examine the effects

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[1] For changes in the attractiveness of SSDI benefits relative to earnings, see Autor and Duggan, 2006 and Muller, 2008. For the earnings disincentive of receiving SSDI benefits, see Maestas et al, 2013, French & Song, 2014, Low and Pistaferri 2015, Deshpande 2016 , and Gelber et al., 2017. For the effects of employment shocks, see Black et al., 2002 and Charles et al., 2018.

of changes in the administration of the SSDI program on participation (Deshpande and Li, 2019; Hoynes, Maestas and Strand, 2023).

Relevant to our study, a closely related literature has looked at the impact of recent Medicaid expansions on SSDI application and enrollment decisions, often finding mixed or null results.[2] Part of these null findings may come from opposing underlying effects. The direct effect of Medicaid expansions may be improvements in participants' health (Baicker et al, 2013) which could lead to corresponding declines in SSDI applications. Conversely, Medicaid participation could make it more likely that untreated conditions are diagnosed and that symptoms are documented (Burns and Dague, 2017; Schmidt et al, 2020). These results could lead to corresponding increases in applications. Further, there may be spillover effects from one government program to another through information sharing or other forms of reduced transaction costs (Baicker et al, 2014; Burns and Dague, 2017; Anand et al, 2018). A key contribution of our paper is our ability to directly speak to the information content of SSDI applications.

Also relevant to this study is the relatively sparse literature on access to health services and the effects on SSDI participation. Health care access may decrease SSDI participation if it improves health outcomes and reduces health-related disutility from working – indeed, individuals receiving DI benefits disproportionately reported difficulty in receiving timely health care prior to enrolling (Schimmel Hyde and Livermore, 2016). Other studies leveraged hospital closures and government provision of health care during the Civilian Conservation Corps to find that access to services reduces SSDI participation (Fischer et al., 2024; Aizer et al., 2024). At the same time, health care access may also facilitate DI enrollment if it allows individuals to better document qualifying conditions – Messel et al. (2023), for example, find that increasing the number of local mental health establishments results in larger flows of SSDI and SSI applications. Our study focuses on access to health services, in contrast to much of the prior literature which focuses on access to health insurance.

This paper also adds to the much smaller literature that has evaluated the consequences of the CHC program. Bailey and Goodman-Bacon (2015) provide a comprehensive review of the historical CHC literature and demonstrate that the first rollout of Community Health Centers substantially enhanced local health care provision in the counties in which they were established,

[2] See Gruber and Kubik, 2002; Baicker et al., 2014; Maestas et al., 2014; Chatterji and Li, 2017; Anand et al., 2018; Goodman-Bacon, 2021a; Burns and Dague, 2017; Soni et al., 2017; Schmidt et al.,2020; Staiger et al., 2024.

resulting in considerable future reductions in age-adjusted mortality rates. In addition, Kose et al. (2024) find that maternal access to the initial rollout of CHCs meaningfully improved infant health outcomes, including a 16% reduction in the likelihood of low birth weight. However, while CHCs have played an increasingly central role in health care provision in the United States over time (including mental health care; see Druss et al. (2006)), studies of their contemporary impacts, along with potential interactions between the CHC program and other government initiatives, have been few.

Most closely related to this paper is Anstreicher (2021), who finds that the establishment of CHCs in the 21st century reduces DI participation in rural counties in the United States using publicly available SSDI enrollment statistics. We expand upon this work considerably with the use of administrative data and frontier econometric methods, the former of which allows us to study DI flows instead of stocks in addition to enabling much more granular geographic analyses and clearer identification of the mechanisms underlying our headline results. Additionally, while Anstreicher (2021) focuses on rural counties due to urban counties possibly having alternate health care resources, our finer geographic data allows us to assess the impacts of CHCs across all locations instead of solely remote ones.

We also focus on the time period containing the Great Recession and its aftermath. This fertile period contains both an acceleration in the number of CHC openings—with a peak in 2013—and a more than doubling in SSDI applications—with a peak in 2010 (Anstreicher, 2021; Maestas et al., 2021). In analyzing the period of the Great Recession, we build upon the literature that has assessed the impacts on employment (Yagan, 2019; Rinz, 2022) and labor force participation (Perez-Arce and Prados, 2020), as well as work that studies the relationship between employment and earnings shocks and SSDI participation (Black et al., 2002; Charles et al., 2018). In particular, our work relates to Maestas et al. (2015, 2021), who find that the Great Recession induced over 400,000 new SSDI beneficiaries who had less severe impairments than average applicants and would not have applied for benefits if not for the downturn. Our results estimate the degree to which CHC openings worked to restrain this flow of applicants. We complement prior work by identifying that publicly provided health services may reduce the impacts of recessions on disability applications and awards, potentially aiding recovery from economic downturns and reducing government expenditure in the long run.

The remainder of the paper is organized as follows. Section 2 describes our data and provides institutional context for the SSDI and CHC programs in the United States. Section 3 explains our empirical strategy for identifying the effects of CHC establishment on the quantity and content of SSDI applications at the ZIP-month level, and Section 4 presents our results. Section 5 discusses the implications of our findings and avenues for potential future research before concluding.

2. Data and Institutional Context

The CHC Program

The Community Health Center program was established with the passage of the Economic Opportunity Act in 1964 as part of Lyndon Johnson's War on Poverty. The first CHCs were established in 1965 in Boston, Massachusetts and Mound Bayou, Mississippi, and the program has grown considerably since. Funding for the initiative saw a noticeable uptick in the 2000s, during which George W. Bush called for a CHC in every poor county in the U.S. By 2008, annual federal funding for the CHC program had reached slightly over $2 billion, and the Affordable Care Act approved an additional $12 billion for program expansions beginning in 2011. This expansion in funding has, predictably, resulted in a recent proliferation of new health centers – between 2007 and 2013, over 1,200 ZIP codes received their first CHC in our sample.

CHCs are designed to serve the health needs of patients residing in medically underserved and/or impoverished areas. Consistent with this goal, most CHC patients' family income lies below the poverty level – in 1984, over 60% of patients had family incomes below the poverty line, and only 15% of patients held more than a high school degree (National Association of Community Health Centers, 1984). This fact has held over time: in 2010, CHCs served more than 20 million citizens, more than 40 percent of whom were uninsured and more than 70 percent of whom were impoverished (Adashi et al., 2010). CHCs focus on the provision of primary and preventive health services, though approximately 20% of CHC visits over the 2004-2014 period were for mental health and/or substance abuse treatment (Anstreicher, 2021). In cases where specialized or acute care is required, providers at CHCs can also refer patients to local hospitals (Wolfe, 2013).

CHCs are typically installed following the awarding of grants from the Health Resources and Services Administration (HRSA) to organizations (typically non-profits, though government organizations may also apply). Currently-operating establishments may also apply for CHC grants if the services they provide and the populations they serve make them consistent with the goals of the CHC program. Grants are of two broad types: "New Access Point" grants support the construction of new health centers or bolster pre-existing centers that had not been receiving funding beforehand, while "Service Area Competition" grants fund grantees that service specific areas in need of continued support. Applications include a detailed proposal for all aspects of the project, including implementation timelines and a demonstration of the value a CHC would provide in the area of interest (typically done through documenting that the area of interest is medically underserved at the time of application). Any center must be operational within 120 days of receiving a grant, and centers are monitored roughly halfway through their award period to ensure compliance with program standards. In addition to grant money, grantees also receive faster Medicare/Medicaid reimbursements, reduced costs of purchasing medications, and medical malpractice insurance. CHCs also fund themselves with charges for services provided to insured or uninsured patients,[3] the latter of whom pay based on their available resources — no patients are rejected based on lack of ability to pay. Currently, the median CHC program grantee oversees six centers and operates in a single county.

Data

The data we use to track the expansion of CHCs over time is the Health Center Service Delivery and Look-Alike Sites database, provided by the Health Resources and Services Administration (HRSA). These data contain the full address of over 12,000 health centers in the United States that are either currently receiving funding from the HRSA or are recognized as a "look alike site," one that fulfills many of the roles of a typical CHC but does not currently receive federal grant money.[4] Our vintage of the data also contains precise information about *when* the center was established for most observations, along with when it was recognized by HRSA as within the scope of the CHC program. Since centers may operate for a considerable amount of time before receiving funding from HRSA, we prefer the establishment date as the relevant measure for determining time of treatment. We restrict the sample to health centers for which we

[3] Attending CHCs does not exclude individuals from receiving Medicaid or Medicare; indeed, about 35 percent and 25 percent of CHC patients are Medicaid or Medicare beneficiaries, respectively.
[4] These sites account for less than 3% of the observations in the data.

observe the exact date of establishment and can link to a specific HRSA grantee, leaving us with a sample of 6,655 centers established in 1980 or later.[5]

Using ZIP code information contained in the center address fields, we limit our sample to ZIP codes that received their first CHC between 2007 and 2013, the former year being the year in which the Great Recession started and the latter year being the final full year for which our data has good coverage of exact establishment date. Table 1 presents summary statistics for ZIP codes that either received their first CHC prior to 2007, received their first CHC in the 2007-2013 range, or never received a CHC in our sample. ZIPs that received their first health center in the 2007-2013 time span are well-balanced along demographic and socioeconomic characteristics, are generally slightly wealthier than ZIPs that received their first CHC prior to 2007 and are much poorer than ZIPs that never receive a CHC, a feature that will inform our preferred empirical specification below.

The SSDI Program

The U.S. Social Security Disability Insurance program is a government initiative that provides compensatory income for those who are unable to work due to a health condition. Beneficiaries of the program also become eligible for health insurance benefits via Medicare two years after entitlement and often qualify concurrently for Supplemental Security Income (SSI; additional income for aged, blind and disabled people of sufficiently low means), which itself confers Medicaid eligibility with no such waiting period. Recipiency rates of DI in the United States have increased notably during the period around the Great Recession: between 2004 and 2018, the average U.S. county saw the percentage of their population aged 20-64 on disability insurance increase by about 1.53 points, or 33 percent, with the Great Recession period seeing especially sharp increases in applications and awards (Maestas et al., 2021).

The disability decision process proceeds in five steps. Step 1 is performed by SSA field offices and consists of verification of SSDI insured status and confirmation that the applicant is not engaged in substantial gainful activity (SGA), defined in 2013 as earning $1040 per month or

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[5] For reference, the HRSA reports funding 8,802 sites in year 2014, indicating that our coverage rates for these sites is roughly 75 percent. The large majority of centers for which we do not observe an exact establishment date appear to be ones that were established recently — over 85 percent of them were recognized by the HRSA as being within the scope of the CHC program in 2014 or later. Because of this, research on the expansion and recession after the Great Recession is less feasible.

more, provided they are not blind. If these criteria are met, the field office collects all required application materials and forwards the application to the state-run Disability Determination Service (DDS) office, where it is assigned to a disability examiner for medical review (Steps 2–5). Step 2 requires the examiner to determine if the individual's impairment is non-severe or temporary (i.e., expected to last less than twelve months). If this is the case, then the application is denied. Step 3 requires the examiner to determine whether the applicant has a medical impairment that appears on SSA's "Listing of Impairments," which includes over 100 impairments that are so severe that they prevent gainful activity.

If the applicant is found to have a listed impairment (or an unlisted impairment of comparable severity), then the applicant automatically qualifies for SSDI without further review of their actual functional capacity and transferability of skills to alternate occupations. If the applicant does not have a listed impairment, he or she proceeds to Step 4. At Step 4, the examiner determines whether the individual can perform any of their past jobs. If so, the application is denied; otherwise, it proceeds to Step 5, at which the examiner determines whether the applicant has the functional capacity and skills to perform any job in the national economy—based on the vocational factors of age, education and work history, regardless of whether such work exists in the applicant's area of residence. An applicant found capable of work is denied benefits, while an applicant found incapable is allowed benefits based on their combination of medical and vocational factors. Denied applicants can repeatedly appeal the decision, which can draw the process out considerably. As a result, studying how CHCs would impact SSDI *awards* would require a large follow-up window, motivating our choice to focus instead on SSDI applications.

Data

Our analysis data consists of all first-time SSDI applications, including applications that are concurrently evaluated for SSI eligibility, filed between 1993 and 2020 that received medical review by a state DDS.[6] We extract these application records from the Social Security Administration's "831" files. Each record in the 831 data system represents a disability determination rendered by the DDS on either initial review or reconsideration, and contains the

[6] We exclude technical denials, most of which are rendered by local field offices prior to sending the application to the DDS for medical review. Common reasons for technical denial include insufficient work credits (resulting in non-insured status) and engagement in substantial work activity.

application filing date, the applicant's place of residence, the DDS decision (e.g., allowed or denied), and the basis for the decision (i.e., why the application was allowed or denied).

Frequently, disability examiners seek additional information about applicants to better evaluate their SSDI eligibility. SSA can purchase patient records from hospitals to acquire more details on applicant ailments, and examiners can also request consultative examinations with medical experts to review their status firsthand. These additional procedures come with non-trivial costs: a typical purchasing fee for medical records is \$13-35, while consultative examinations cost SSA approximately \$300-650.[7] Notably, our data contain information on whether either of these occur for a given application. Table 2 presents summary statistics concerning the number and characteristics of applications for all ZIPs that receive an initial CHC after 2000 as well as for our stacked analysis sample, which we describe more in the subsequent section. Across these samples, additional queries for information are common: nearly 90% of applications entail the disability examiner purchasing additional records regarding the applicant, and consultative examinations are requested for nearly half of applicants. The rate of initial SSDI allowances is, by comparison, low, and the typical applicant waits over half a year after their initial disability onset to file their application. Figure 1 presents average application volume nationwide over time, featuring an increase that begins with the start of the Great Recession and a notable decrease after its conclusion that gradually recedes.

3. Empirical Strategy

Our target estimand is the causal effect of the establishment of a CHC on SSDI applications and awards. The simplest way to attempt to distinguish potential causal DI reductions from reductions that would have occurred irrespective of the implementation of a CHC would be to use a standard two-way fixed effects event-study estimator:

$$Y_{it} = \alpha_i + \gamma_t + \sum_{\tau \neq -1} \delta_\tau \cdot D_{it}^\tau + \varepsilon_{it},$$

where τ indexes event time and $D^{\tau}_{it}=1$ for treated zip codes at event time τ. The coefficients of interest, then, are the δ_τ terms, which are interpreted as the effect of CHC implementation on SSDI application and awards at the corresponding event time.

[7] These amounts vary by state. The figures are approximations based on states that report the amounts to SSA.

However, a large recent literature has demonstrated that estimates of δ_τ may be biased by treatment effects from other periods when treatment timing is staggered (Sun and Abraham, 2021; Callaway and Sant'Anna, 2021; Goodman-Bacon, 2021b). Additionally, a key assumption of this standard model is that treatment effects are homogenous across groups of ZIP codes that share a treatment year. This assumption is very likely to be violated in our context, given that the local impacts of the Great Recession were widely dispersed across geography (Yagan 2019). If worse local shocks increased the number of individuals on the margin of applying for SSDI, then CHCs in these more severely-impacted areas may have had a considerably larger effect on SSDI applications.

Many recent estimators designed to address these issues use never-treated units as control units for units that are treated at some point in time. However, given evidence from Table 1 that ZIPs that receive a CHC at some point in time are highly distinct across economic and demographic observables from ZIPs that never do, we prefer to avoid using never-treated ZIPs as control units. Thus, for our baseline specification, we adopt a stacked difference-in-differences estimator in the style of Deshpande and Li (2019). For a given opening year in our data from the years 2007-2013, we take ZIPs that experience an initial CHC establishment as treated ZIPs, while ZIPs that receive a CHC two years or more in the future are coded as control ZIPs. We then append all datasets generated this way into a single dataset, resulting in a sample with 1,495 ZIPs that experience an opening in the 2007-2013 range for which we observe event years -7 to 2, totaling 420,751 observations at the ZIP-month level. Figure 2 illustrates the available comparison years for establishment years 2007-2010. Following Deshpande and Li (2019), we include additional establishment years 2011-2013 in the analysis data set that do not have available comparison years.[8]

We then estimate the following equation on the sample:

$$Y_{iet} = \alpha_i + \gamma_t + \delta_0 T_{ie} + \sum_{\tau \neq -1} D_{et}^{\tau} + \sum_{\tau \neq -1} \delta_\tau \cdot (T_{ie} D_{et}^{\tau}) + \varepsilon_{iet},$$

where e indicates establishment month or year. The variable T_{ie} is an indicator variable equal to 1 if ZIP i is a ZIP treated (that is, experiences its first CHC opening) in establishment year e. The variables D^{τ}_{et} now equal 1 if year t is τ years after or before establishment e. As before, the δ_τ are

[8] As noted in section 2, the exact dates of establishment are not available for later potential comparison years.

the coefficients of interest. We cluster standard errors at the ZIP level and weight ZIPs by their number of applications 7 to 18 months prior to treatment. We aggregate to the annual level in both calendar time and event time when reporting most results.

The identifying assumption of our specification is that, absent a CHC opening, the number and characteristics of SSDI applicants would trend comparably in areas that received a CHC at a given time relative to areas that experienced a CHC opening in the future. This does not assume that the CHC implementations themselves are random events – which, given Table 1, seems dubious – but rather that the *timings* of the CHC openings are as good as random among ZIPs that receive one at some point in time.

While this identifying assumption is not directly testable, several indirect tests offer support. First, the timing of the change in applications coincides with the timing of center openings. Figure 3 shows the δ_τ from the estimation equation on the monthly level with the month before center opening as the omitted group. For the month of center opening, applications are significantly lower at the 10 percent level of significance (not shown), and for the month immediately after opening the decline is significant at the 5 percent level. Second, there is no observable trend in event time over the 84 months before center openings and none of the coefficients are statistically significant (5 percent level). Third, as discussed above, there is a high degree of balance along observable characteristics among ZIPs that received their initial CHC in the 2007-2013 range (Table 1). As an additional method for assessing balance in our sample, we regress the date of treatment, measured as days since the start of year 2007, on various ZIP characteristics. The result of this exercise, presented in Appendix Table A.1, indicates that treatment timing among ZIPs in our sample generally does not systematically vary along observable characteristics: no single covariate is associated with treatment timing at a five percent level of significance or stronger, and all covariates together explain less than two percent of the variation in establishment dates. Finally, we compare early and late openings of CHCs during our analysis period by mapping their corresponding counties in Figure A-1. We observe no geographic patterns in the timing of openings. These four pieces of evidence support the identifying assumption that the timing of center openings is equivalent to random.

4. Results

Number of Applications

Figure 3 demonstrated that the establishment of CHCs are associated with near-immediate reductions in DI claims in the ZIP codes in which they are installed. To facilitate presentation of our results, moving forward we average our estimates of δ_τ over years of event-time. Table 3 and Figure 4 present these aggregated estimates. We find that, by the second year of operation in a ZIP code, CHCs are associated with a reduction of 33.2 monthly applications per one million residents. This represents a meaningful reduction: on a basis of 420.2 monthly applications per million residents, our estimates constitute a 7.9% reduction in application volume. Over half of this reduction is attributable to applications that would have been allowed at the initial level of review. Of these initial allowances, the majority were allowed as medical-vocational decisions (step 5, as described above) rather than by meeting the listings. By contrast, less than half of the reduction is due to initially denied applications, and this figure is imprecisely estimated.

These results support the hypothesis that center openings improve the health of the local population. Specifically, they improve the health of some of the residents with severe impairments who would have applied for SSDI in the absence of treatment, many of which would have been allowed at the initial level of review. CHCs improving health is consistent with previous entries in the literature – in particular, Bailey and Goodman-Bacon (2015) find that the initial rollout of CHCs was associated with substantial reductions in mortality in the counties in which they were established. An additional piece of evidence is provided by the estimates of the effect of center openings on the diary date of allowed applicants. The diary date is the date of the upcoming Continuing Disability Review (CDR) that is set by the DDS examiner at the time of decision. The CDR date corresponds to expectations about whether medical improvement is expected, possible or not expected (Hemmeter and Stegman, 2013); thus, we use it as a proxy for severity of impairment. The estimate in Table 3 reflects that CDRs are about 16 days sooner in the year of center openings, or about 1 percent earlier. This indicates that allowed applicants are slightly healthier after center openings. This effect fades after the year of the center opening.

While our preferred interpretation of the estimates is that CHCs reduce SSDI claims through improving the health of those they serve, alternate interpretations warrant discussion. Through providing an assurance of locally available and reasonably priced care, CHCs may also influence work decisions through decreasing expected *future* costs to working in addition to any potential immediate effects. Although we cannot address this hypothesis directly, we provide indirect evidence in Table 4 where, across columns we group applicants in descending order of attachment to the labor force. In column (2), we show estimates for SSDI-only applicants. These applicants have a sufficient work history to qualify for SSDI and their benefit amount—based on their work history—typically rules out SSI eligibility.[9] We compare this to column (3), which shows estimates for SSDI applicants who are potentially concurrently eligible for SSI.[10] This implies that they have a sufficient work history to qualify for SSDI but that their work history leads to a lower benefit amount that does *not* disqualify them from SSI. Finally, in column (4), we make an out-of-sample comparison to SSI-only applicants. These applicants do not have sufficient work history to qualify for SSDI. The deterring effect of CHCs declines as we move across columns, indicating that the largest impact is among applicants with the highest lifetime labor force attachment. Although HRSA grants target low-income populations, our results support the perhaps surprising result that the impacts of CHCs on SSDI claims are not necessarily concentrated at the bottom of the income distribution.

Another way in which CHCs may reduce SSDI claims is through replacing care that may have connected individuals with SSDI more quickly, in particular emergency room visits. We find this mechanism less likely to be driving our results due to the fact that CHCs are expressly intended to provide routine as opposed to emergency care. This intention of the CHC program manifests well in how CHCs are utilized: between 2004 and 2014, less than three percent of visits to HRSA grantees were for emergency care (Anstreicher, 2021).

Finally, CHCs may reduce SSDI claims is through decreasing the need for health insurance coverage by providing local health care at a low price. This may in turn reduce the number of individuals who submit SSDI or SSI claims who are in part motivated by the eventual Medicare or immediate Medicaid eligibility they confer upon being awarded. Table 4 speaks to this hypothesis as well – the fact that our estimated impacts are fairly strongly concentrated among DI-

[9] The comparisons in this paragraph are inexact because applicants can be disqualified from SSI eligibility for reasons other than the amount of their SSDI benefit. This can occur because of financial resources over the asset limits or current income over the income limits, after adjustments. Nevertheless, the general progression of declining lifetime labor force attachment described here holds on average.

[10] As discussed above, an initial evaluation of financial eligibility for SSI is determined in the Social Security field office before the application is transferred to the Disability Determination Service for evaluation of medical and vocational criteria.

only claims casts doubt on this particular interpretation of our findings, since the insurance motivation would be particularly strong for SSI claims.

Application Content

Next, we assess the countervailing hypothesis that Community Health Centers provide improved documentation of existing impairments, possibly making SSDI benefits easier and/or quicker to obtain. To probe this question, we begin by defining well-documented applications as those that do not require the DDS to request a consultative examination of the applicant nor purchase medical evidence from a prior medical provider. Columns (2) and (3) in Table 5 present estimates of the effect of CHC openings on the number of applications that required these additional steps. Corresponding to the overall decline in the number of applicants, the number of claims with these characteristics also decline.

Column (4) in Table 5 shows the inverse of this, the effect on the number of applications that require *neither* of these additional steps and so meet our definition of being well-documented. These also decline. The negative estimates allow us to reject the hypothesis that CHC openings improve the documentation of conditions and increase the number of well-documented applications. We set aside the effect on the number of applications and examine the effect on the *proportion* of well-documented applications in column (5). We estimate a precise null effect. Altogether, Table 5 finds no support for the hypothesis that CHC openings lead to more well-documented applications or even an increase in the proportion of well-documented applications given the volume. In addition, we have a direct measure of whether CHC openings lead to a decline in the number of applications that were denied for insufficient evidence. When we investigate this outcome variable, shown in the last column of Table 3, we again find a precisely estimated null effect.

We also investigate whether CHC openings lead to applications that can proceed through the process faster. The last two columns in Table 5 estimate the effect of openings on time intervals, including the number of days from the onset of the impairment to initiating the application (for initially-allowed applicants only) and the number of days in process at the DDS (for all applicants). For both intervals, we estimate a precise null effect. Taken together, our results are inconsistent with the hypothesis that CHCs meaningfully changed SSDI application content or speed.

Heterogeneity

As a final analysis, we explore which specific potential applicants can be deterred from applying in Table 6. Over one-third are people with disorders of the skeletal spine.[11] We provide suggestive evidence that another third is people with depressive, bipolar and related disorders but these estimates are imprecise. We also detect statistically significant reductions in applications for muscular (and related) disorders, blood disorders, and asthma—in contrast, for all other diagnoses (rightmost column), we obtain precise null effects. Notably, this final grouping contains people with impairments that are far less responsive to the sort of routine treatment that CHCs provide, including respiratory, cardiovascular, genitourinary, hematological, endocrine and neurological disorders, as well as cancer and other types of musculoskeletal and mental disorders that are not included in the second and third columns. We take these results as additional evidence in support of the hypothesis that CHCs impacted SSDI claims through improving health conditions that are likely to be responsive to routine treatment and monitoring.[12]

5. Conclusion

Despite the remarkable growth of the SSDI program during the Great Recession, its interaction with public health initiatives has received little attention. In this paper, we aim to advance this literature by studying how one of the most prominent public health programs in the United States impacted the quantity and evidentiary quality of SSDI applications. We find compelling evidence that CHCs deter SSDI applications through improving health conditions in the locations in which they are established. Moreover, individuals may travel to other ZIP codes for health treatment, and alternate health care options may exist in a location. Both considerations would introduce attenuation bias into our main specification – as such, we view our results as conservative estimates of the elasticity of SSDI applications to health care provisions more generally, especially in times of economic distress. Given the large cost of SSDI awards and the very low rate of individuals

[11] The disorders of the skeletal spine category includes: arthritis, chronic joint pain or stiffness, osteoarthritis, hip replacements, knee replacements, back pain, spinal fusions, bulging or ruptured disks, herniated disk, spinal osteoarthritis (spondylosis), degenerative disk disease, vertebrae fracture or dislocation, ruptured tendons, and fractures of the femur, tibia, pelvis, or talocrural bones.
[12] We also find that the magnitude of the effect is fairly consistent over the years of our analysis period, as seen in Table A.2.

leaving DI rolls, our findings may have considerable implications for the cost-benefit properties of the CHC program and other similar initiatives.

We explore the mechanisms underlying the impact of CHCs on the SSDI program. Primarily, the decrease in recipiency is due to an immediate decline in the flow of applications in areas where CHCs open. In agreement with prior literature, the evidence is compatible with the mechanism of improvements in health in these geographic areas. We find the evidence is not compatible with alternative mechanisms, such as CHCs substituting for health insurance in general or treatment in emergency rooms.

The evidence also rejects the alternate mechanism that CHCs provide better documentation of medical evidence and help applicants navigate the SSDI application process itself. We obtain precise null estimates of the impacts of CHCs on the completeness of evidence in SSDI applications as well as application speed. This suggests that more specialized resources may need to be offered to disadvantaged communities to streamline SSDI applications and help ameliorate issues of incomplete program take-up. With SSDI application delays being associated with additional losses in applicant earnings and employment (Autor et al., 2017), further research into the factors that alleviate application bottlenecks, along with broader explorations into the intersection of social insurance and public health, will likely be worthwhile.

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Tables and Figures

Table 1: ZIP-Level Summary Statistics by CHC Opening Date

Time of First CHC	**< 2007**	**2007-2009**	**2009-2011**	**2011-2013**	**Never**
Pct White, 2000	51.08	59.27	58.00	63.59	79.00
	(30.70)	(28.49)	(28.22)	(28.23)	(22.61)
Pct Black, 2000	21.41	16.99	18.62	17.56	9.00
	(26.05)	(22.97)	(23.76)	(22.81)	(16.06)
Pct Single Parent, 2000	38.59	34.63	34.17	34.34	25.32
	(14.44)	(12.34)	(12.48)	(11.77)	(10.56)
Pct College, 2000	18.32	20.35	20.62	19.96	23.75
	(12.13)	(12.14)	(13.10)	(11.76)	(15.22)
Population, 2000	51.34	45.20	52.26	46.52	31.20
	(28.45)	(23.49)	(32.59)	(25.64)	(22.59)
2000-2010 Pop Change	4.57	6.67	5.17	6.38	7.99
	(17.39)	(17.00)	(15.40)	(19.15)	(20.96)
Mean HH Income, 2000	66.30	71.90	72.69	70.86	82.86
	(19.97)	(20.15)	(24.38)	(19.08)	(30.59)
Employment Rate, 2000	55.26	57.65	57.25	58.38	61.18
	(8.49)	(7.58)	(8.07)	(7.75)	(8.28)
2004-2013 Job Growth	1.08	1.09	0.78	0.77	1.15
	(3.03)	(2.91)	(3.22)	(2.73)	(3.88)
Pct Poor, 2000	19.34	15.68	16.03	14.81	10.54
	(9.73)	(8.63)	(8.84)	(7.64)	(7.41)
Pct Male, 2000	48.87	48.80	48.74	48.56	49.13
	(2.55)	(1.97)	(2.50)	(1.93)	(2.37)
Pct Age 20-65, 2000	58.47	59.02	58.90	58.73	58.84
	(5.24)	(5.00)	(5.19)	(4.44)	(4.51)
Pct Age 45-65, 2000	20.44	21.45	20.93	21.49	23.26
	(3.38)	(3.49)	(3.71)	(3.09)	(3.74)
Median Age, 2000	33.72	34.93	34.60	34.98	36.88
	(4.31)	(4.35)	(4.24)	(3.98)	(4.31)
Observations	2311	311	372	616	23792

Notes: Data at ZIP code level, weighted by population. Table presents ZIP code characteristics by timing of first CHC implementation. Mean HH (household) income and population measured in thousands of dollars and individuals respectively. Data for CHC timing from HRSA Health Center Service Delivery and Look Alike Sites file. Data for population from Census tract population estimates, and data for other covariates from Opportunity Insights at tract level. Tracts then merged to ZIP codes using HUD Crosswalk file and collapsed using residential shares of ZIP code populations in specific tracts.

Table 2: Characteristics of Applications in ZIP Codes

	All ZIP codes with CHC, 2000 to 2015	Stacked Analysis Sample, Opening Dates 2007-2013
Number of Unique ZIP Codes	2,368	1,495
Number of Applications per ZIP Code per Month	406.7	420.2
	(583.9)	(552.5)
Initial Allowance Rate	34.2	34.2
	(24.5)	(24.1)
Rate Purchasing Evidence of Record	88.5	88.6
	(17.1)	(16.8)
Rate Requesting Consultative Examination	45.7	47.2
	(26.8)	(26.4)
Time from Disability Onset to Filing, Days	222.4	221.3
	(174.8)	(173.8)
Observations, ZIP-Months	394,158	420,751

Notes: Table reports characteristics of SSDI applications at ZIP code level. Data at ZIP code level, weighted by population. Data for CHC timing from HRSA Health Center Service Delivery and Look Alike Sites file. Application data from SSA 831 Files. See text for details. Applications are measured as number per million individuals.

Table 3: Impacts of CHC Opening on SSDI Applications

		Initial Allowances				Initial Denials	
VARIABLES	Applications	Total	Listings	Medical-Vocational	Diary Date, Days from Allowance	Total	Insufficient Evidence
Year of Opening	-13.1	-8.5*	-0.6	-7.8**	-16.2**	-4.6	0.5
	(8.1)	(4.5)	(1.9)	(3.6)	(8.1)	(5.8)	(0.9)
One Year After	-26.5**	-13.6*	-3.1	-10.4*	-5.3	-12.9	-0.8
	(11.5)	(7.6)	(2.5)	(5.7)	(9.6)	(8.0)	(1.3)
Two Years After	-33.2**	-19.7*	-3.5	-16.1*	3.2	-13.5	0.3
	(14.5)	(11.3)	(2.7)	(9.3)	(11.7)	(8.6)	(1.9)
Observations	420,751	420,751	420,751	420,751	164,844	420,751	420,751
R-squared	0.817	0.623	0.463	0.514	0.121	0.775	0.366
Mean Y Variable	420.2	138.8	63.80	74.80	1893	281.2	16.40

Notes: Table reports regression estimates of impact of CHC opening on SSDI applications. Standard errors clustered at the ZIP level and are in parentheses. *: p<0.1, **: p<0.05, ***: p<0.01. Sample includes ZIP codes that receive first CHC between years 2007 and 2014. Specification uses stacked estimator following Deshpande and Li (2019). Data at ZIP-month level; estimates aggregated to annual level. Applications are measured as number per million individuals. Data from HRSA Health Center Service Delivery and Look Alike Sites file and SSA 831 Files. See text for details.

Table 4: Impacts of CHCs on SSDI and SSI Applications

	SSDI Applications			SSI Only Applications
	(1)	(2)	(3)	(4)
TYPE OF CLAIM	All	SSDI only	Concurrent with SSI	All
Year of Opening	-13.1	-11.5**	-1.7	7.5
	(8.1)	(4.9)	(4.3)	(7.1)
One Year After	-26.5**	-18.3**	-8.0	18.4
	(11.5)	(7.6)	(5.7)	(13.1)
Two Years After	-33.2**	-23.5**	-9.2	20.7
	(14.4)	(11.6)	(6.4)	(15.0)
Observations	420,751	404,732	420,751	26,414
R-squared	0.817	0.756	0.752	0.649
Mean Y Variable	420.2	207.1	221	141.7

Notes: Table reports regression estimates of impact of CHC opening on SSDI applications, separated by concurrent DI and SSI claims and DI claims alone. Sample includes ZIP codes that receive first CHC between years 2007 and 2014. Standard errors clustered at the ZIP level and are in parentheses. *: p<0.1, **: p<0.05, ***: p<0.01. Specification uses stacked estimator following Deshpande and Li (2019). Data at ZIP-month level; estimates aggregated to annual level. Applications are measured as the number per million individuals. Data from HRSA Health Center Service Delivery and Look Alike Sites file and SSA 831 Files. See text for details.

Table 5: Impacts of CHCs on Characteristics of SSDI Applications

	Counts of Applications				Rate	Application Speed, Days	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
VARIABLES	All	Evidence of Record Purchased	Consultative Examination Requested	Neither (2) nor (3)	Neither (2) nor (3)	Time from Disability Onset to Claim Filing	Time at the DDS
Year of Opening	-13.1	-12.3	-5.0	0.0	0.12	-2.8	-0.3
	(8.1)	(7.5)	(4.2)	(1.5)	(0.16)	(2.0)	(0.6)
One Year After	-26.5**	-21.9**	-12.2**	-2.4	-0.10	-2.2	-0.2
	(11.5)	(10.9)	(5.6)	(2.3)	(0.20)	(2.2)	(0.9)
Two Years After	-33.1**	-25.2*	-11.1	-6.3**	-0.32	-4.0	0.2
	(14.5)	(13.5)	(7.4)	(2.5)	(0.26)	(2.8)	(1.2)
Observations	420,751	420,751	420,751	420,751	437,413	372,718	437,413
R-squared	0.817	0.804	0.686	0.251	0.159	0.086	0.334
Mean Y	420.2	373.8	200.5	25.80	6.4	221.3	105.3

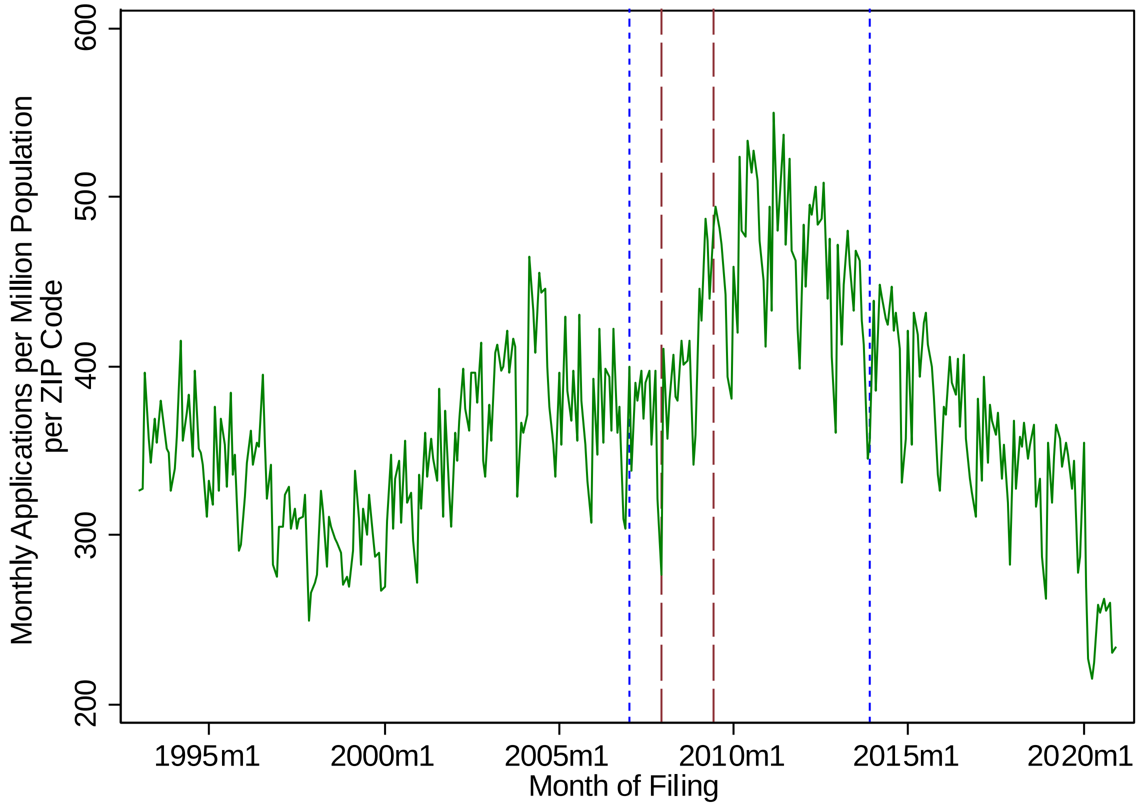
Notes: Table reports regression estimates of impact of CHC opening on SSDI applications. Standard errors clustered at the ZIP level and are in parentheses. *: p<0.1, **: p<0.05, ***: p<0.01. Sample includes ZIP codes that receive first CHC between years 2007 and 2013. Specification uses stacked estimator following Deshpande and Li (2019). Data at ZIP-month level; estimates aggregated to annual level. Applications are measured as the number per million individuals. Effects on time from disability onset to claim filing measured for initially-allowed applicants only, while effects for time at DDS are estimated for all applicants. Data from HRSA Health Center Service Delivery and Look Alike Sites file and SSA 831 Files. See text for details.

Table 6: Impacts of CHCs on SSDI Applications by Diagnosis

VARIABLES	Applications	Disorders of the Skeletal Spine	Depressive, Bipolar and Related Disorders	Osteoarthrosis and Inflammatory Arthritis	Blood Disorders	Disorders of Muscle, Ligament and Fascia	Asthma	All Other Diagnoses
Year of Opening	-13.1	-5.1*	-5.0	-2.3	-1.4	-0.6	-0.8	-1.4
	(8.1)	(2.9)	(4.0)	(1.6)	(1.2)	(0.7)	(0.5)	(2.6)
One Year After	-26.5**	-10.3**	-11.6*	-3.7*	-1.8	-2.4**	-1.0*	-4.7
	(11.5)	(4.4)	(6.4)	(2.1)	(1.6)	(1.1)	(0.5)	(3.2)
Two Years After	-33.2**	-12.9**	-14.4	-4.0	-3.3*	-1.7	-1.8**	-4.9
	(14.4)	(5.9)	(9.7)	(2.5)	(1.8)	(1.3)	(0.7)	(3.5)
Observations	420,751	420,751	420,751	420,751	420,751	420,751	420,751	420,751
R-squared	0.817	0.622	0.634	0.401	0.375	0.331	0.136	0.691
Mean Y Var	420.2	99.10	104.4	41.90	37.50	19.60	8.0	168.6

Notes: Table reports regression estimates of impact of CHC opening on SSDI applications, separated by primary diagnosis. Standard errors clustered at the ZIP level and are in parentheses. *: p<0.1, **: p<0.05, ***: p<0.01. Sample includes ZIP codes that receive first CHC between years 2007 and 2013. Specification uses stacked estimator following Deshpande and Li (2019). Data at ZIP-month level; estimates aggregated to annual level. Applications are measured as the number per million individuals. Data from HRSA Health Center Service Delivery and Look Alike Sites file and SSA 831 Files. See text for details.

Figure 1: SSDI Applications by Date



Data Source: 831 files, Master Address File. Long dashed lines show end dates of the Great Recession. Short, dashed lines show the end dates of the analysis period.

Figure 2: Years of Data Used in Analysis Sample

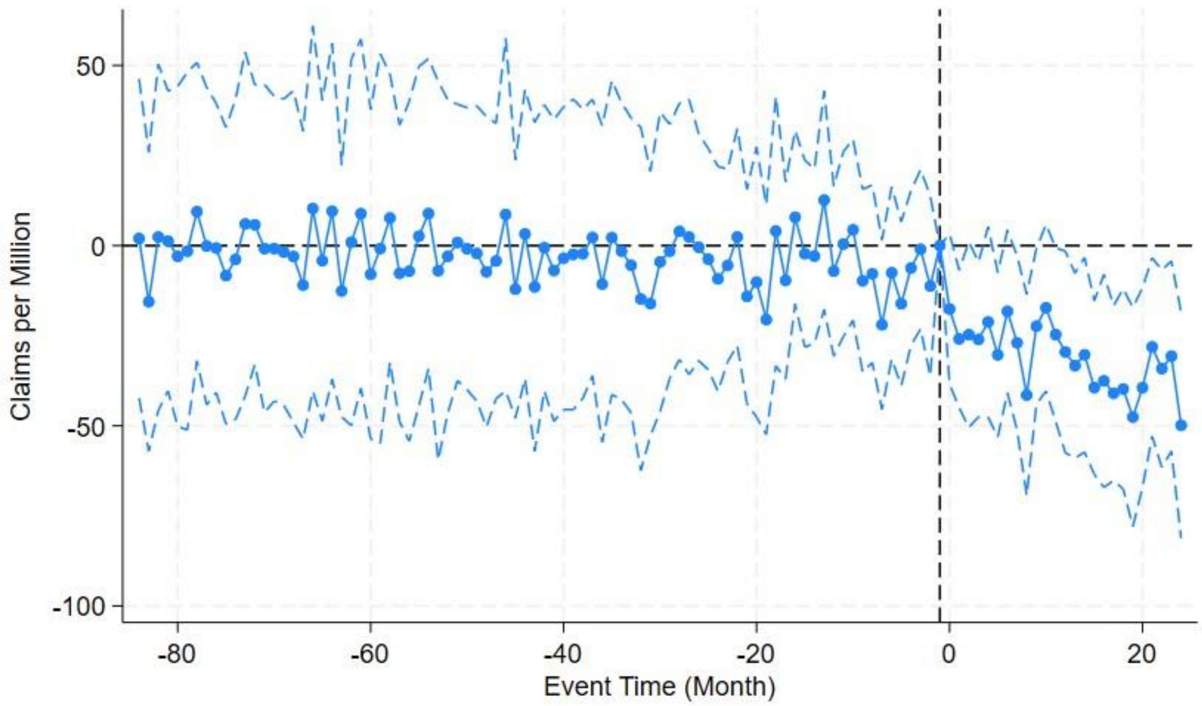
2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
-7	-6	-5	-4	-3	-2	omit	X	+1	+2	C	C	C	C	C	
	-7	-6	-5	-4	-3	-2	omit	X	+1	+2	C	C	C	C	
		-7	-6	-5	-4	-3	-2	omit	X	+1	+2	C	C	C	
			-7	-6	-5	-4	-3	-2	omit	X	+1	+2	C	C	
				-7	-6	-5	-4	-3	-2	omit	X	+1	+2		
					-7	-6	-5	-4	-3	-2	omit	X	+1	+2	
						-7	-6	-5	-4	-3	-2	omit	X	+1	+2

Legend:

X	Treatment year
*	Pre-treatment period
+*	Post-treatment period
C	Not-yet-treated comparison group

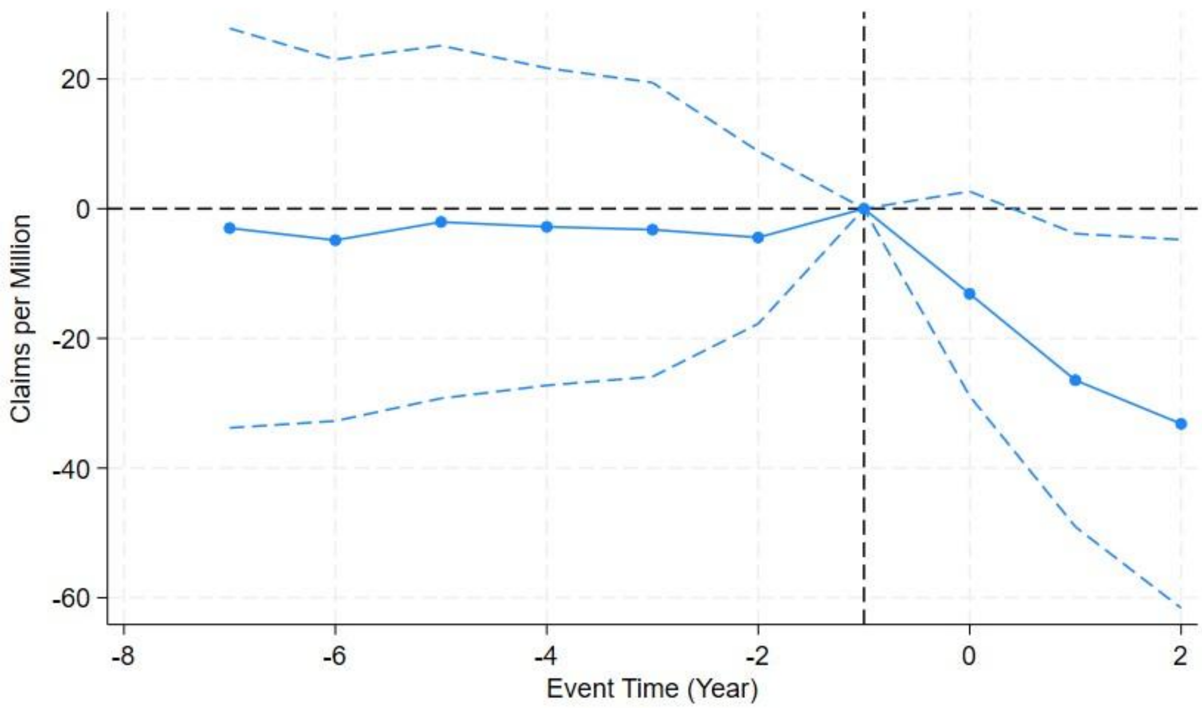
Notes: Figure shows years of data used in analysis sample and categorizes years based on use in empirical specification. Green cells denote treatment years, pink cells denote pre-treatment periods, blue cells denote post-treatment periods, and yellow cells denote not-yet-treated comparison groups. Lines below gray line indicate treatment years that have no control units in stacked design. Sample includes ZIP codes that receive first CHC between years 2007 and 2013. Data from HRSA Health Center Service Delivery and Look Alike Sites file and SSA 831 Files. See text for details.

Figure 3: Event Study Results, Monthly Level



Notes: Figure presents estimates of CHC opening on SSDI applications among ZIP codes that received first CHC between 2007 and 2013. Baseline specification employs a stacked event-study estimator following Deshpande and Li (2019). Dotted lines show 95% confidence intervals, with standard errors clustered at the ZIP level. Data at ZIP-month level. Applications are measured as number per million individuals. Data from HRSA Health Center Service Delivery and Look Alike Sites file and SSA 831 Files. See text for details.

Figure 4: Event Study Results, Annual Level



Notes: Figure presents estimates of CHC opening on SSDI applications among ZIP codes that received first CHC between 2007 and 2013. Baseline specification employs a stacked event-study estimator following Deshpande and Li (2019). Data at ZIP-month level; estimates aggregated to annual level. Applications are measured as the number per million individuals. Dotted lines show 95% confidence intervals, with standard errors clustered at the ZIP level. Data from HRSA Health Center Service Delivery and Look Alike Sites file and SSA 831 Files. See text for details.

Appendix: Supplementary Tables and Figures

Table A.1: Regression of Treatment Timing on ZIP Pre-Treatment Covariates

VARIABLES	(1) Days Since 2007
Pct White, 2000	2.469
	(1.596)
Pct Black, 2000	2.248
	(2.153)
Pct Single Parent, 2000	-3.116
	(4.088)
Pct College, 2000	2.542
	(3.961)
Population, 2000	1.229
	(1.309)
2000-2010 Pop Change	2.141*
	(1.245)
Mean HH Income, 2000	-4.016
	(2.519)
2004-2013 Job Growth	-7.572
	(5.268)
Pct Poor, 2000	-20.43
	(13.84)
Pct Male, 2000	-3.327
	(7.481)
Pct Age 20-65, 2000	14.06
	(13.45)
Pct Age 45-65, 2000	14.06
	(13.45)
Median Age, 2000	-19.62*
	(10.69)
Observations	1,251
R-squared	0.018

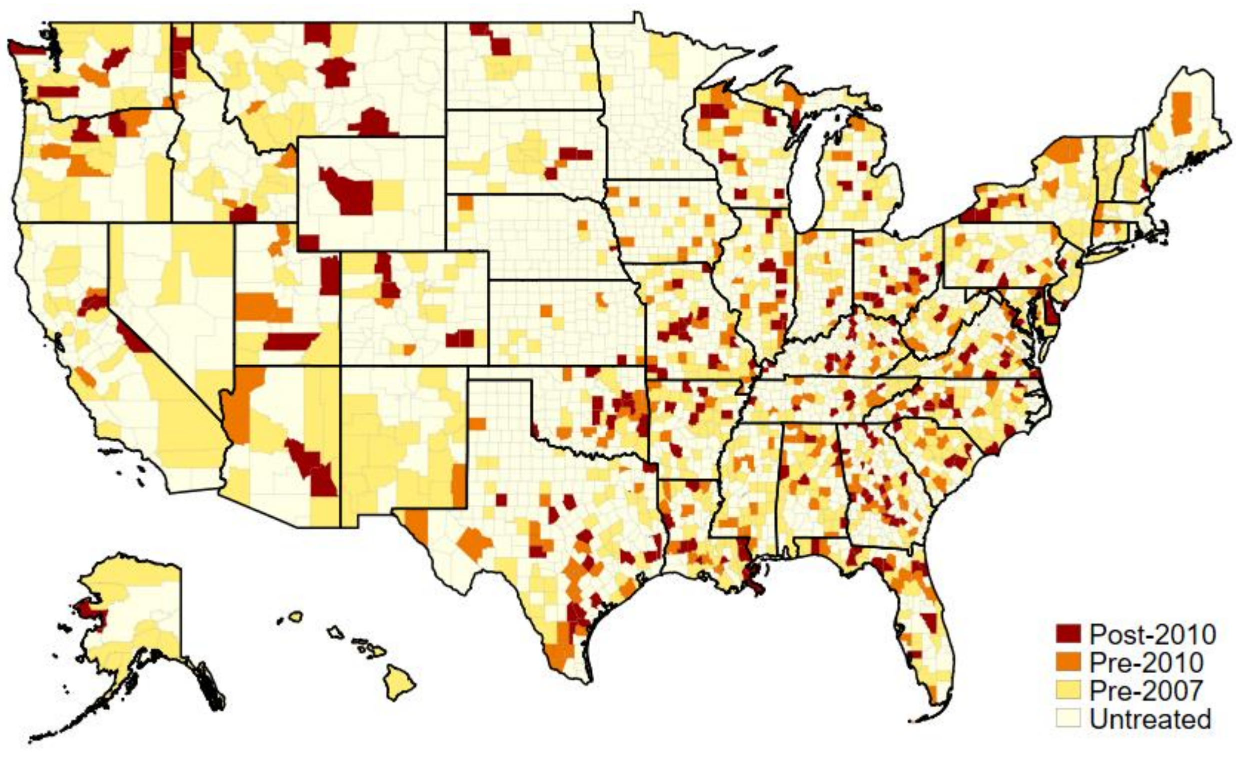
Notes: Standard error in parentheses. ***: p<0.01, **: p<0.05, *: p<0.1. Data at ZIP code level, weighted by population. Table presents regression output from regressing timing of first CHC implementation on ZIP-level covariates for ZIPs observed to receive their first CHC between 2007 and 2013. Mean HH income and population measured in thousands of dollars and individuals respectively. Data for CHC timing from HRSA Health Center Service Delivery and Look Alike Sites file. Data for population from Census tract population estimates, and data for other covariates from Opportunity Insights at tract level. Tracts then merged to ZIP codes using HUD Crosswalk file and collapsed using residential shares of ZIP code populations in specific tracts.

Table A.2: Effect of CHCs on Applications by Year of Opening

YEAR OF OPENING	All	2007	2008	2009	2010
Year of Opening	-13.118	-9.174	-1.167	-3.279	-16.845
	(8.052)	(7.712)	(9.626)	(11.246)	(17.021)
One Year After	-26.450**	-27.476**	-28.668**	-5.046	-41.831**
	(11.529)	(11.022)	(13.892)	(22.417)	(17.602)
Two Years After	-33.181**	-38.159***	-31.968	-21.529	-29.086
	(14.493)	(14.439)	(26.175)	(21.386)	(18.160)
Observations	420,751	115,172	99,674	79,279	53,129
R-squared	0.817	0.804	0.805	0.842	0.838
Mean Y Variable	420.2	396.8	404	432.9	460.4

Notes: Table reports regression estimates of impact of CHC opening on SSDI applications, separated by year of establishment. Sample includes ZIP codes that receive first CHC between years 2007 and 2014. Standard errors clustered at the ZIP level and are in parentheses. *: $p<0.1$, **: $p<0.05$, ***: $p<0.01$. Specification uses stacked estimator following Deshpande and Li (2019). Data at ZIP-month level; estimates aggregated to annual level. Applications are measured as the number per million individuals. Data from HRSA Health Center Service Delivery and Look Alike Sites file and SSA 831 Files. See text for details.

Figure A.1: County CHC Treatment Timing



Notes: Figure displays timing of CHC implementation across U.S. counties. Data from HRSA Health Center Service Delivery and Look Alike Sites file. See text for details.