

Healthcare worker supply response to Medicaid expansion

Scott Loring*

June 19, 2023

Abstract

When 21 million people got insurance through the Affordable Care Act's Medicaid expansion in 2014, how many healthcare jobs were created? We study the supply response to a large expansion of health insurance to low income Americans using both firm and worker data. Comparing states which expanded Medicaid eligibility to the states which still have not, we measure firm employment, wages, and healthcare facility counts as well as worker income and hours. Leveraging data about non-healthcare firms, we are able to difference out common labor market trends to remove some bias in the selection of expansion/non-expansion states. We find Medicaid expansion is associated with increases in average healthcare wages in rural counties. Expansion is also associated with increases in healthcare employment and no increase in facility count. These increases in employment don't seem to be driven by increases in any particular healthcare occupations, meaning that labor supply seems to respond for the full set of healthcare industry occupations. These results can help us understand the policy effects and geography of large insurance expansions and the elasticity of healthcare labor markets. In fact, Medicaid expansion is still available as a policy option to several states who have yet to expand.

Keywords: health insurance, Medicaid, Affordable Care Act, healthcare workers

JEL Codes: I11, I13, I14

*University of Chicago Harris School of Public Policy, sloring@uchicago.edu. This research would not have been possible without the support of Zarek Brot-Goldberg, Joshua Gottlieb, Dan Black, and many others. This paper was supported by the Agency for Healthcare Research and Quality under grant award T32 HS000084 (PI: Tamara Konetzka, PhD). Its contents are solely the responsibility of the author and do not necessarily represent the official views of the AHRQ.

1 Introduction

Public insurance programs have been at the core of the dramatic expansions in both health-care expenditures and health insurance since the 1960s. Expansions of public insurance programs and subsidies for private health insurance markets for low-income Americans resulting from the passage of the Affordable Care Act (ACA) in 2010 has resulted in a dramatic increase in the insured rate in the US population. Expansion of health insurance increases demand for healthcare by decreasing the prices paid by patients when seeking care (Manning et al, 1987). Previous research has demonstrated that hospitals and other healthcare providers have expanded supply to meet the rising demand that accompanies large insurance expansions. However, there is significant variation in the access to care and reimbursement rates across insurance plans public and private. Expansions of insurance with minimal cost-sharing for patients and low reimbursement rates for healthcare providers might generate a demand response for patients without an equivalent supply response from healthcare providing institutions. When examining the effects of past insurance expansions and planning for future expansions, it is important to understand how the supply of healthcare labor responds to large insurance expansions.

The ACA was the largest reform of the health care industry since the birth of Medicaid and Medicare in the 1960s and reduced the uninsured rate substantially. Still, non-elderly insured rates are near 10 percent as of 2021 (KFF, 2023). As of 2018, the share of the population without health insurance was 16.1 percent in non-expansion states, more than double the 7.5 percent uninsured rate of expansion states (Haley et al. 2018). It is estimated that more than 2 million Americans would be eligible for Medicaid coverage if the non-expansion states expanded coverage. Medicaid expansion policy radically reshaped insurance coverage for tens of millions of Americans. Why then, wouldn't we expect the size of the healthcare workforce to simply grow to accommodate these newly insured individuals? Healthcare institutions as well as jobs are highly regulated by several overlapping authorities and there are significant constraints that new facilities face when opening, including local certificate of

need laws. Similarly, the training of new doctors and nurses is constrained by education institutions for those crucial set of healthcare workers.

More than half of newly insured individuals resulting from the reforms in the ACA came from the 2014 Medicaid expansion. This expansion only happened in some states, allowing us to see how healthcare worker supply responded in expansion and non-expansion states. With data on industry employment and earnings for workers from the County Business Patterns (CBP) data as well as the American Community Survey (ACS), we find that Medicaid expansion was associated with an increase in the number of healthcare employees and the wages of those workers. The wage effect is largely driven by wage increases for healthcare workers in the most rural counties. These wage effects are similar for healthcare workers of widely different levels of post-secondary education.

This paper proceeds as follows. In Section 2, we describe the measurement of healthcare labor markets and the insurance expansions creating the demand shocks. Section 3 describes the strategy used to estimate the impact of Medicaid expansion on healthcare labor supply. Section 4 presents and discusses results from the estimation strategy, including results from the CBP and the ACS. Extensions of these main results are presented in section 5. Section 6 provides discussion of results in the context of other work and concludes.

1.1 Background

The Affordable Care Act (ACA) was passed in March of 2010. The ACA initially mandated states to expand Medicaid coverage in 2014 to include childless adults making less than 138 percent of the federal poverty level. Five states, including California, expanded Medicaid coverage to low-income residents prior to 2014. In June of 2012, the US Supreme Court ruled in *National Federation of Independent Business (NFIB) v. Sebelius* that states were not obligated to expand insurance coverage in their Medicaid programs in the way specified and funded in the ACA. This resulted in a number of states not expanding Medicaid eligibility in 2014, some of whom have since expanded eligibility and some of who still had not as of

2019, the end of our observational period.

We can see that the gap in the share of healthcare employees in 2014 expansion states and non-expansion states opens up around the time of the passage of the Affordable Care Act. This gives us strongly suggestive evidence that the healthcare labor market is evolving differently in expansion and non-expansion states.

Prior to the passage of the Affordable Care Act (ACA), there was significant variation across states in the structure and eligibility requirements for coverage. The ACA's Medicaid expansion substantially changed the requirements for Medicaid eligibility by stripping away categorical requirements and asset tests, simplifying eligibility to be based almost exclusively on monthly modified adjusted gross income. This income threshold of 138 percent of the poverty threshold was roughly \$16,600 for an individual in 2019. This simplified the process for determining eligibility as well as expanding eligibility, resulting in a substantial number of new Medicaid enrollees who were eligible under the previous eligibility criteria.

As discussed, the ACA is credited with providing 35 million previously uninsured Americans with health insurance, and 21 million of those were from the expansion of state Medicaid programs. However, the other portions of the ACA provided coverage for the remainder of the millions and instituted a large set of reforms to the US healthcare system. The ACA mandated the purchase of health insurance and enforced this mandate with a penalty. The non-Medicaid insurance expansions included ACA exchanges and a set of federal subsidies to purchase insurance on these exchanges for individuals earning less than 400 percent of the poverty level. Importantly, individuals could not be denied health insurance coverage for pre-existing medical conditions, and health insurance plan premiums could only be priced based on geographic area, age, and smoking status, while limiting the ratio of premiums across those groups for the highest to be no more than 3 times the price of the lowest.

2 Data

In order to measure the supply response to the expansion of insurance access, we use two different sources of annual figures aggregated within geographic areas, both of which are publicly available from the US Census Bureau. County level aggregate figures for employment, total payroll, and establishment count are available for industries using the North American Industry Classification System (NAICS) from the County Business Patterns (CBP data series from 2000 through 2019. We supplement these county level characteristics with health, economic, and demographic characteristics from the American Community Survey (ACS) as well as the Small Area Health Insurance Estimates (SAHIE), a convenient extract of ACS information about health insurance coverage. In addition to these county-level aggregates, we also use individual level data from the ACS 1% sample, which allows us to estimate effects on worker incomes and hours directly. We use information on the timing of Medicaid expansions from the Kaiser Family Foundation. All of the used data sources are publicly available from the Census Bureau and other sources.

In the County Business Patterns data, the unit of observation being aggregated to the county level are business establishments, which are physical places of business. These records of establishments are the most complete, current, and consistent data for places of business in the US. NAICS codes beginning with 62 make up the Health Care and Social Assistance industry and in order to define the set of health care establishments, several industries are removed.¹

Some of the information in the CBP is censored to avoid disclosure of employment or payroll of individual establishments. County level figures are censored if there are 10 or fewer establishments in a county. Censoring means that employment is categorized into being in one of 12 buckets and that payroll is entirely omitted. This full censoring of employee

¹We remove the the social assistance categories from our aggregate NAICS 62 figures to arrive at estimates of the healthcare industry only. This includes all NAICS codes beginning with 624, including Individual and Family Services (6241), Community Food and Housing, and Emergency and Other Relief Services (6242), and Child Day Care Services (6244)

payroll for a number of counties results in a slightly different sample for employment results and average wage results. In particular, the smallest counties by population are relatively more likely to be excluded from the wage estimation relative to the employment estimation. Whenever employment or payroll is censored for one year, we ensure that it is censored for the entire time series for that county. Our primary variables of interest from these data are employment and average payroll per employee.

The ACS 1% is accessed through IPUMS USA and the sample runs from 2005 through 2019. These data consist of a random sample of individuals in the US and contain detailed economic and demographic information. The individuals sampled in each year change, meaning that there is no way to follow individuals longitudinally. Healthcare workers are identified in the sample by industry codes and occupation codes. The ACS does not provide county level geography for individuals living in counties with smaller populations, so we simply use the state that they live in as the geographic identifier.

Several states expanded Medicaid prior to 2014, and several states expanded after 2014. The primary sample for this estimation will include only states which expanded in 2014 or did not expand prior to 2019, the end of our sample. This excludes a number of states which expanded income eligibility prior to the year 2000, as well as five states which expanded in 2010-2011 and several more who expanded between 2015 and 2019. These timing groups of states are presented in Figure 2.

Expansion and non-expansion states vary in their demographics and baseline insured rates. Table 1 shows that expansion and non-expansion states diverged from one another slightly on several important figures relevant to health insurance expansion both before and after expansion. Expansion states already had higher insured rates prior to the ACA and Medicaid expansion. We can also see that the expansion of Medicaid is driving the higher increase in insured rate in expansion states relative to non-expansion states. In part because of these notable differences between expansion and non-expansion states, we use triple differences estimation which compares the healthcare industry to other industries in

the same geography. This means that even large differences in observables such as racial composition or poverty rate between expansion and non-expansion counties in levels or in trends should not bias our estimation of the Medicaid expansion effect.

3 Empirical strategy

We can see from Figure [size of Medicaid increases in enrollment] that millions of previously uninsured low-income Americans get access to health insurance through Medicaid starting in 2014 across expansion states. These large increases in access to healthcare through insurance have the important effect of lowering the cost of seeking a wide range of healthcare services. These millions of Americans with new access to insurance serve as a large demand shock for the healthcare providing institutions in expansion states. There is evidence that patients newly insured through Medicaid use more healthcare services than when they were uninsured (Brookings Papers on Economic Activity, Fall 2019). In order to better understand the relationship between insurance expansion and healthcare labor supply, we can estimate the effect of this 2014 insurance expansion on the employment and wages of healthcare workers.

One straightforward way of estimating the impact of the 2014 Medicaid expansion is a two-way fixed effects model of our labor outcomes. This is represented by equation 1

$$y_{ct} = \alpha_c + \gamma_t + \beta_1 * T_{ct} \mathbb{1}\{year \geq 2010\} + \delta(s \times t) + \varepsilon_{ct} \quad (1)$$

where the dependent variable y_{ct} is the outcome for a county c in year t , for example, aggregate employment or average wages. The two way fixed effects are county fixed effects α_c and year fixed effects γ_t . The variable T_{ct} is a dummy which takes the value 1 in counties in Medicaid expansion states on or after 2014.

The Medicaid expansion portion of the ACA was first announced in 2010, at which point states began to respond. Results using the announcement year of 2010 as the cutoff (rather than 2014) are contextually similar (though attenuated) to results using the implementation

point of 2014. The uncertainty at the state level about whether expansion would happen in 2014 resolved itself gradually from 2011 to 2014. We do see some pre-implementation response, and we see this as responding to expansion status in anticipation of implementation. We present the results using the announcement date as the treatment initiation as complementary to our main results which use 2014 as the treatment cutoff.

Our coefficient of interest is β_1 , which estimates the post-expansion average difference in outcomes between expansion and non-expansion states. Standard errors are clustered at the level of treatment, which in this case is at the state level. In order for this two-way fixed effects model to estimate a treatment effect of Medicaid expansion, it would be necessary that in the absence of Medicaid expansion, counties in expansion states would have had the same growth or decline trajectory in healthcare employment, wages, and establishments relative to their state trend as counties in non-expansion states. Including the state-year linear time trend $\delta(s \times t)$ allows for that parallel trends assumption to be weakened to counties in expansion and non-expansion states having the same trajectory only relative to their average state trend in the absence of expansion. Estimation is done with Poisson regression for counting outcomes with no natural upper bound (Woolridge 1990), which includes employment and establishments, but not average earnings per employee.

The estimation of equation (1) can be illustrative, but may not itself be evidence of the causal effect of Medicaid expansion on healthcare labor supply response. It's possible that a county's employment and income levels can be inputs into a state's decision as to whether or not to expand Medicaid coverage. Many of the arguments levied against Medicaid expansion concern the disincentives to work that low-income Americans face when receiving publicly provided health insurance. If there is a disincentive to work, which previous work has found in some limited settings (Garthwaite Noto) but not in others (Kaestner) this would bias my results against finding an effect on employment or incomes in expansion states. Still, if states are deciding against expanding because their counties are experiencing slower wage growth or declines in employment across all industries relative to expansion states, we have an issue

with the parallel trends assumption. In this way, we would prefer to measure healthcare labor outcomes relative to other local labor market outcomes so that we can most clearly see the ways that Medicaid expansion is affecting healthcare workers relative to workers in other industries.

The ACA Medicaid expansion in 2014 also coincided with the launch of the non-group marketplace plans (sometimes referred to as “Obamacare plans”) and the first year of several other programs as part of the ACA. These began in both the expansion states and the non-expansion states, and affected employers and workers in both healthcare and non-healthcare industries in both of those different states. Though there are many moving pieces in healthcare and new incentives in labor markets in 2014, we have no reason to expect that these changes would be different in expansion states rather than non-expansion states other than those changes resulting from Medicaid expansion.

3.1 Triple differences

In order to deal with concerns about differences between expansion and non-expansion counties in local economic conditions, we can difference our healthcare labor market outcomes with outcomes for all non-healthcare industries. Doing this relaxes one assumption of the two way fixed effects model and add a different assumption. The triple difference allows for county-specific deviations from parallel trends so long as those deviations are common between the two local labor markets. The parallel trends assumption is now an assumption of parallel ratios between healthcare and non-healthcare jobs in expansion and non-expansion states (Olden Moen 2022). In the absence of Medicaid expansion, the ratios would have evolved along the same trajectory. Healthcare labor markets are connected with local markets for non-healthcare labor, with many workers in healthcare industry working in occupations which are not exclusive to healthcare, and healthcare occupation workers experiencing common shocks to wage and employment resulting from local economic conditions. The triple difference model is the primary specification we are relying on to understand the rel-

ative changes in healthcare labor response to Medicaid expansion. It can be estimated with the form

$$\begin{aligned}
y_{ct} = & \alpha_c + \gamma_t + \eta_i + \\
& \mu_1 \alpha_c \times \gamma_t + \mu_2 \alpha_c \times \eta_i + \mu_3 \gamma_t \times \eta_i + \\
& \beta_1 * T_{ct} \mathbb{1}\{year \geq 2010\} \mathbb{1}\{\eta_i = health\} + \varepsilon_{ct}
\end{aligned} \tag{2}$$

where there are three fixed effects, county c , year t , and industry i for indicating healthcare or the aggregate of all non-healthcare industries. The second line of the estimation contains interaction terms of all three fixed effects: year by county, county by industry, and year by industry. The coefficient of interest is a dummy which takes value of 1 for the healthcare industry of Medicaid expansion counties after expansion. The sample of this regression is the same as the two way fixed effects except that there are two observations for each county year, one for healthcare and non-healthcare outcomes. Standard errors are still clustered at the state level. Estimation of these results for the CBP is presented in Table 3.

4 Results

Our triple differences estimation allows for us to understand the differences in employment and wages for healthcare workers between expansion and non-expansion states relative to their local non-healthcare worker counterparts in Table 2. We find that employment increases for healthcare jobs by roughly 3% in expansion states. Looking at the raw change in the healthcare share of expansion and non-expansion states in Figure 1, we can see that non-expansion states had 12.5% of their workforce in the healthcare industry in 2008, with expansion states at 12.9%, a difference of less than 0.4%. A decade later, in 2018, the difference between healthcare share in expansion and non-expansion states had widened to

0.7% (14.4% and 13.7%). Though raw figures aren't fully reflective of the more appropriate estimation via triple differences, the difference in growth of raw employment suggest a similar magnitude of employment effect for healthcare workers resulting from Medicaid expansion.

These new healthcare workers can come from a number of other previous jobs, including unemployment, but they mostly come from non-healthcare industry jobs. This means that this 3% estimate of Medicaid's effect on healthcare employment is biased slightly upward, as Medicaid expansion is causing employment to increase in healthcare and slightly decrease in all other industries. Accounting for this effect, however, is not substantially likely to affect interpretation of the results.

We can see in our event study for employment, Figure 3, that the employment effect of Medicaid expansion seems to start in 2013 rather than 2014, when the Medicaid program actually increases its enrollment. This is likely to be the result of an anticipation effect, given that healthcare establishments and institutions knew that the expansion was coming as early as 2010, with the constitutionality of Medicaid expansion confirmed by the US Supreme Court in 2012. The employment figures in the County Business Patterns represent employment and annual payroll for the week of March 12, which indicates that this anticipatory hiring is likely to have happened at least 9 months prior to the new Medicaid enrollees seeking healthcare services.

Our results also show that average wage growth for healthcare workers was higher for healthcare workers in expansion states, again relative to non-healthcare wage growth in those states. Our results suggest that average wages are roughly 2.5% higher. Because our worker income here is calculated as the average payroll per employee, this means that healthcare workers in expansion states are each earning more in addition to there being more healthcare workers. Though it might straightforward to assume that more demand for a profession's workers would result in high wages for those workers, this depends on the average wages of the new workers. Many of the highest paid healthcare workers have training timelines ranging from years to over a decade. Expanded scope of practice laws in many states have resulted

in workers with lower wages and less time in training substituting for physician labor. These results can't speak directly to the effects of scope of practice laws, but these results mean that despite concerns from physicians and hospitals about low Medicaid reimbursement rates, average wages are increasing. If the employment effect came entirely from hiring lower-wage workers to meet rising demand, we would not see the increase in wages that we do.

Similar to employment, our event study for healthcare worker average wage, Figure 3, shows that the wage effect for healthcare workers in expansion states seems to phase in beginning in 2011. The treated sample of states in this estimation includes only states which expanded Medicaid precisely in 2014, not before or after. Healthcare institutions and workers learn in 2010 that there will be a large insurance expansion in 2014 with some probability. As time passes from 2011, this uncertainty about which states will expand Medicaid and which will not resolves into states having a very good idea of the size of expansion and the demand they will face by 2013. This trajectory is different from that of employment, which is important to note. It's possible that as uncertainty about expansion is resolved, healthcare institutions shift wages more slowly over time, while waiting to hire new employees (or reduce employee turnover) until they absolutely have to in order to respond to the new demand.

Our results don't find that Medicaid expansion has much effect on the count of healthcare facilities in the near term, though it's possible that there is a longer-run effect, which we can see in Figure 4. Given that employment has increased, it's reasonable to wonder why facilities haven't increased. In particular, Medicaid coverage for previously uninsured individuals replaces uncompensated care provided by some types of establishments, which might remove barriers to expanding facilities or provide resources to prevent closures of other facilities. However, we have a lot of heterogeneity across our types of healthcare establishments, as can see from our summary stats table. The median healthcare establishment in our sample is relatively small with less than 20 employees.

The sample for employment and establishments differs from that for average wage in Table 3 because payroll is censored for the smallest counties, meaning that the wage results

reflect a sample of larger and relatively more populous counties. Results are broadly similar for employment and establishments when restricted to the same sample of counties as wage in Appendix. Similarly, results are broadly similar when we use the implementation year of 2014 as the cutoff for the difference in differences rather than the announcement year of 2010, and can be seen in Table 10.

4.1 Including expansions before and after 2014

Our results are robust to changing our sample substantially to include a number of states which expanded Medicaid as part of the ACA both before and after 2014. Several states, including California, expanded Medicaid in 2010-2011. Others, like Pennsylvania, didn't approve the expansion until 2015 or later, but expanded eligibility prior to the end of our observation period in 2019. By shifting our estimation from real years to event time, we can include these early and late expanders in our sample. In event time, each state's years are rescaled so that they represent the year relative to the year of Medicaid expansion in that state, which is year 0. For example, Illinois expanded Medicaid in 2014, so year 2012 is recorded as event time year -2, which lines up with 2014 in Montana where Medicaid expansion happened in 2016. Year fixed effects (not event year) are still included alongside county fixed effects and the units which are never treated in 2000-2019 are included but only used to help estimate year and county fixed effects. We can see from Table 3 that the results from this estimation process are similar to the results from the 2014 expansion state only estimation. The event studies for this event time methodology and plot the coefficient of the event years in Figure 10 look broadly similar to the fixed time results. This gives us confidence that the effects we see for 2014 expansion states are similar in size to the effects of states that expanded before or after 2014. Importantly, it indicates that expansion would have similar effects for states which have not yet expanded Medicaid coverage.

4.2 Medicaid expansion effects by urban/rural counties

Our estimates from Table 5 indicate that Medicaid expansion's effect on wages varies substantially by county geography. The wage increases for healthcare workers are driven by the smallest and most rural counties. Though these smaller counties make up the majority of the counties, this compositional effect does not drive the effect for employment, which appears to be increasing broadly across geographies.

When we examine these expansion effects by the county geography type by splitting our sample into the largest three county geography types and the smallest three geography types. In Figure 7 we can see that our wage effect is pronounced for small/rural geographies and not similarly present for the large/urban geographies. No similar divergence between urban and rural counties is present for healthcare employment growth. We have strong evidence from the ACS as well that positive income effects from Medicaid expansion are present for rural counties, but not urban ones (see Table 13).

We can see that the counties have on average similar changes in the Medicaid rate following expansion in Table 7, so this result is not driven by more new enrollees in more rural counties. However, we can see that these expansion counties had higher rates of poverty and initial Medicaid coverage, which tells us that these counties may have had lower average wages prior to expansion. It may be the case that these lower wage counties experience larger increases in healthcare worker wages because of Medicaid reimbursement rates being relatively flat across different counties within a state. In rural expansion counties with lower wages, those relatively higher reimbursements could translate to higher wages. Given that the wages we're measuring are employee earnings, this provides some evidence that these increases in Medicaid coverage are not simply transfers from the government to hospitals and do increase the compensation of rural healthcare workers.

4.3 Workforce composition in the ACS

We can also use the ACS to estimate the effect of Medicaid expansion on changes in the composition of the healthcare workforce. In particular, we want to know how Medicaid expansion may be changing the types of workers and what kind of workers make up the increases in healthcare employment.

The ACS records details about worker education, occupation, and industry which allow for greater insight into the shifting landscape of healthcare jobs post-ACA. This allows us to learn about how Medicaid expansion might create shifts in the healthcare workforce. To estimate these differential changes, we can estimate an event study of impact that Medicaid expansion has on the probability that a worker has a job as a nurse.

However, because of Census Bureau protections which censor the geographic location of individuals the set of individuals, it is not possible to identify the locations of workers within a given state. In the CBP, county units are used to identify the changes in worker outcomes relative to a pre-expansion baseline. In the ACS, the workers from each year are sampled in a cross-section, so geographic units must be used for the baseline in difference-in-differences estimation. We deal with this censoring of geographic information. We estimate these workforce composition effects in the ACS using state-level fixed effects. This doesn't allow for the granularity of fixed effects that we have in our estimation of the CBP using county level units, but allows for estimation on the full sample of the workers in the ACS.

It doesn't seem that the employment growth in expansion states is driven by increases in any particular sector of healthcare employment. We can see in Table 8 that Medicaid expansion doesn't increase the share of individuals working in any of these particular healthcare occupational categories, which range from degree-specific roles like nurses and physicians/surgeons to broad catch-all categories like healthcare support occupations and non-healthcare jobs in the healthcare industry. We can see the effects of expansion on employment shares for these roles over both the short and medium term (5 years after implementation). Healthcare support roles, including medical assistants and home health aides, don't increase

at different rates. We can see in these event studies in Figure 8 that expansion doesn't seem to substantially affect the composition of the workforce in the years following expansion.

We show evidence that expansion increases healthcare employment in expansion counties and yet we can't find evidence of diverging trends in any specific employment categories. This indicates that the labor supply response to Medicaid expansion doesn't appear to be the result of substituting or supplementing physician/nurse labor with less costly healthcare support workers. The lack of divergence here provides evidence that the additional hiring of new workers into the healthcare industry related to the expansion of Medicaid appears to be happening in similar proportions across these four categories. Healthcare support workers can't do the jobs of nurses, but they can perform some of the tasks often asked of nurses. Similarly, non-healthcare occupational workers can't perform healthcare tasks, but can support administrative burdens experienced by workers performing healthcare tasks.

4.4 Weighting CBP estimation by population

The samples in the ACS and CBP differ from one another in the geographic units that make them up. The unit of measurement in the CBP is the county, which represents roughly the local labor markets that respond to the demand shocks of Medicaid expansion. The ACS, by contrast, counts individual workers as the units composing the sample. This means that estimates from the same analysis on the ACS and the CBP can be substantially different due to this difference in the measuring units and how those units are weighted relative to one another. The ACS is weighted by population, while the CBP is weighted by county. Of course, we can make the two analogous by weighting the CBP estimation with county population weights. As we are primarily interested in the effects of Medicaid expansion on healthcare labor market supply response rather than individual worker supply response, we present the CBP results weighing counties equally as the core specification. When we do this, as presented in Table 11 we see that our effect sizes for employment are similar, while the effect sizes for wages are smaller. This small, insignificant wage effect is similar to what

we find when we estimate the income effect and hours worked effect for workers in the ACS in Table 12. The event studies for the ACS in Figure 13 don't indicate much in the way of specific trend, and there is substantial noise from year to year. This accords with the finding in Table 5 that our county wage effects are driven by effects in the smallest and most rural counties. This is evidence that though wage effects on the average healthcare worker from Medicaid expansion may be limited, the effect on rural healthcare workers could still be substantive and positive.

4.5 Income effects by educational attainment

Though it doesn't appear that Medicaid expansion affects the income or hours worked by the average healthcare worker, it could be that this null effect of expansion is obscured by differential changes for workers of different levels of educational attainment. We find that the effects of expansion are not substantially different from zero for workers with more or less than an associates degree. Table 9 shows effects. However, there are small differences between the estimated insignificant effect sizes that are worth noting. Estimated income effect sizes for less educated worker are nearly double those of workers with more education, and average hours worked seem to increase for more educated workers and decrease for less educated workers following Medicaid expansion. Because the geographic unit of fixed effects for the ACS is the state, these differences may be reflective of differences in educational composition across geography. If workers in rural counties in a given state are less likely to have a college degree, as appears to have been the case in 2019 ², these heterogeneous effects by educational level may simply be a reproduction of our heterogeneous effects by geography.

²Source: National Center for Education Statistics: <https://nces.ed.gov/programs/coe/indicator/lbc/educational-attainment-rural?tid=1000>

5 Conclusion

Previous work has shown that health insurance expansion increase demand for healthcare, and should lead to expansion of healthcare supply. This increase in healthcare labor supply appears to be happening similarly across several distinct categories of healthcare workers. Despite a number of supply constraints on healthcare workers, including low Medicaid reimbursement rates and worker training times, healthcare labor supply appears to respond sharply to the demand for services created by Medicaid expansion. In fact, healthcare institutions in expansion states appear to anticipate the future demand shocks, hiring employees almost a year prior to expansion kicking off. Wages for healthcare workers do not seem to rise in urban areas, but do seem to rise substantially in the most rural parts of expansion states. Given that many of the states which have yet to expand Medicaid have many rural counties, it's worth noting that Medicaid expansion appears to increase healthcare wages in those communities. From the perspective of limit government outlays on healthcare, employment supply response with no wage increases in rural counties might be preferable. It is clear that low Medicaid reimbursement rates are not fully driving healthcare workers away from healthcare relative to not expanding Medicaid coverage, and neither are those reimbursement rates reducing worker incomes relative to the option of not expanding Medicaid coverage. As has been shown in previous work, it does seem that greater insurance coverage and access to care does in fact increase total spending on healthcare, though this paper only speaks to the labor portion of that spending. With access to establishment-level employee and payroll records, it would be possible to get more reliable estimates of these effects at the facility level, with greater level of granularity of Medicaid expansion's effects on different types of healthcare facilities than presented here. Future work can build on the broad results here by examining how specific price levels of reimbursement rates induce or stem labor supply response to insurance expansions.

6 References

Cooper, Z., S. Craig, M. Gaynor, and J. Van Reenen, “The Price Ain’t Right? Hospital Prices and Health Spending on the Privately Insured,” *Quarterly Journal of Economics*, 2018, 134 (1), 51–107.

Dunn, A., J. Gottlieb, A. Shapiro, D. Sonnenstuhl, and P. Tebaldi, “A Denial a Day Keeps the Doctor Away,” NBER Working Paper No. 29010 2021.

Finkelstein, A., “The Aggregate Effects of Health Insurance: Evidence from the Introduction of Medicare,” *Quarterly Journal of Economics*, 2007, 122 (2), 1–37.

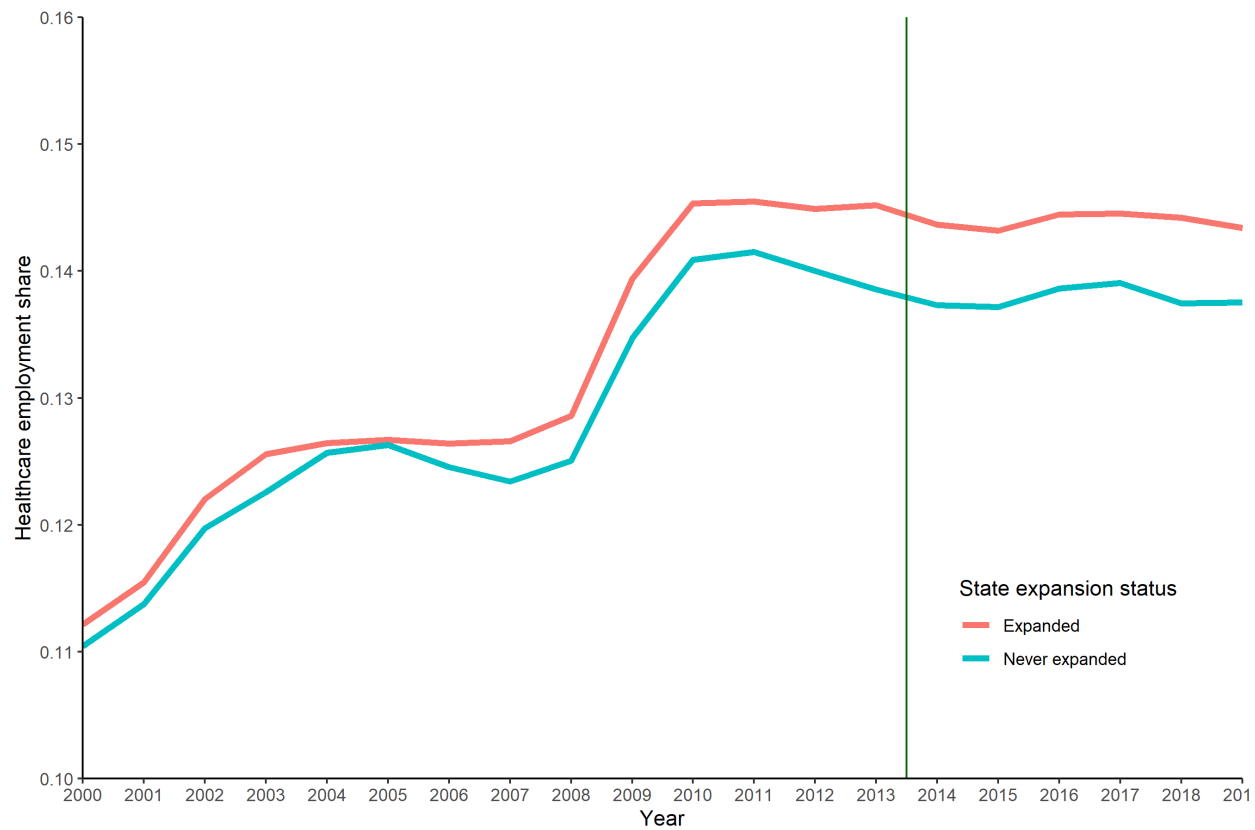
Finkelstein, A., S. Taubman, B. Wright, M. Bernstein, J. Gruber, J. Newhouse, H. Allen, K. Baicker, and the Oregon Health Study Group, “The Oregon Health Insurance Experiment: Evidence from the First Year,” *Quarterly Journal of Economics*, 2012, 127 (3), 1057–1106.

Garthwaite, C., J. Graves, T. Gross, Z. Karaca, V. Marone, M. Notowidigdo, “All Medicaid Expansions Are Not Created Equal: The Geography and Targeting of the Affordable Care Act” *Brookings Papers on Economic Activity*, Fall 2019.

Geddes, E., M. Schnell, “The Expansionary and Contractionary Supply-Side Effects of Health Insurance,” Working Paper 2022.

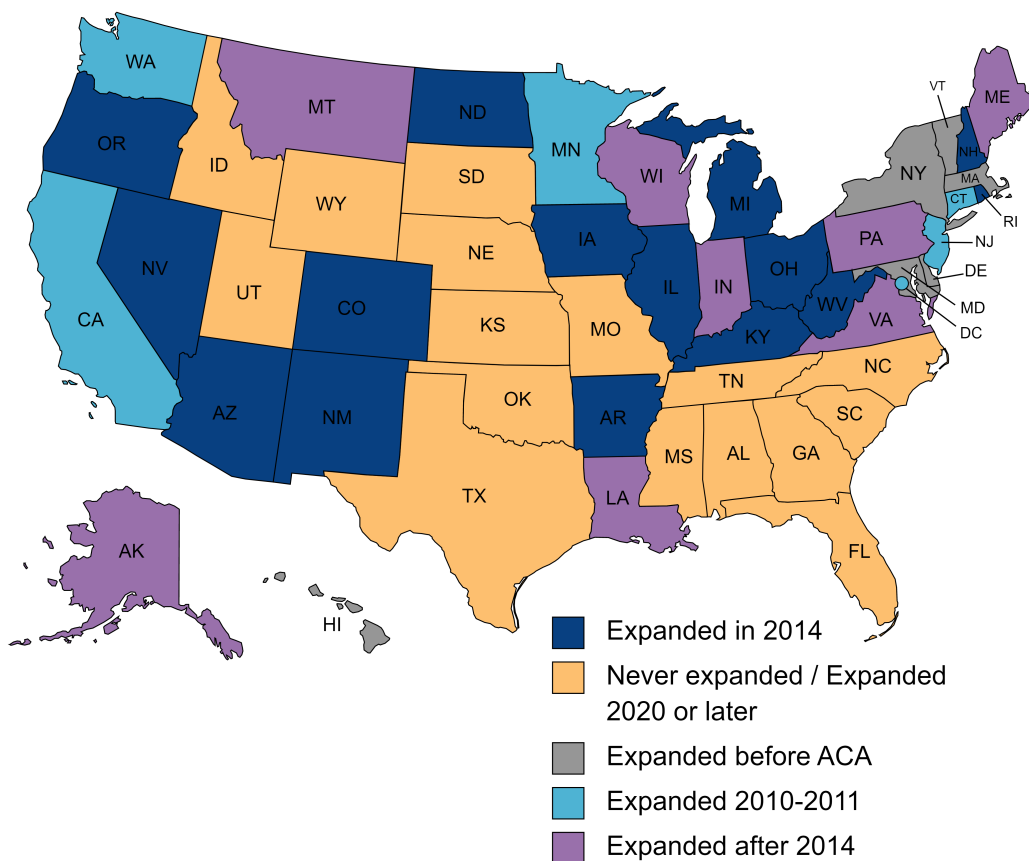
Figures

Figure 1: Health care employment share



Notes: Graph includes only states which expanded in 2014 or did not expand prior to 2020.

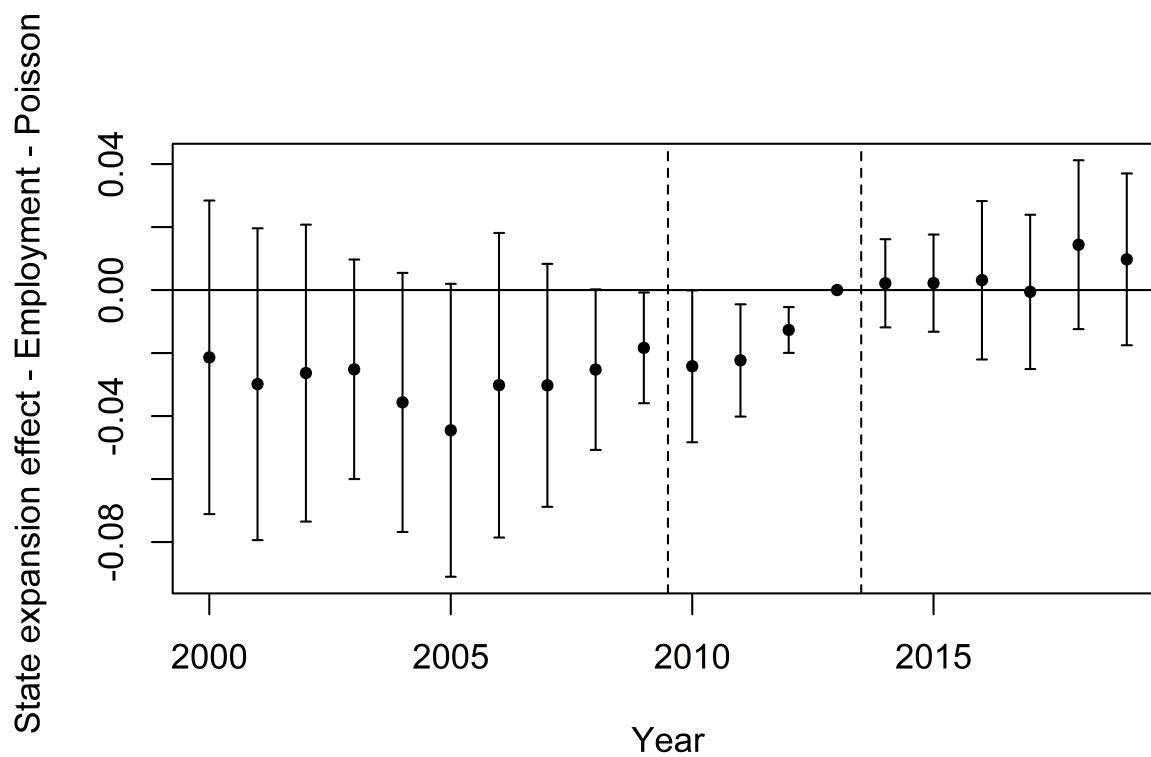
Figure 2: Medicaid expansion state map



Notes: For the primary specification in fixed time, the group “Expanded in 2014” is used as the Medicaid expansion treatment group, and the group “ Never expanded / Expanded 2020 or later” is used as the non-expansion control group. Results are robust to including the “Expanded before ACA” and “Expanded 2010-2011” groups in the 2014 expansion date, as their Medicaid enrollment substantially increased in 2014. Results are broadly similar when shifting from fixed time expansion to event time, using each state’s expansion year and including the “Expanded after 2014” group.

Figure 3: Medicaid expansion effect on county healthcare industry outcomes

(a) Healthcare employment



(b) Healthcare average wages

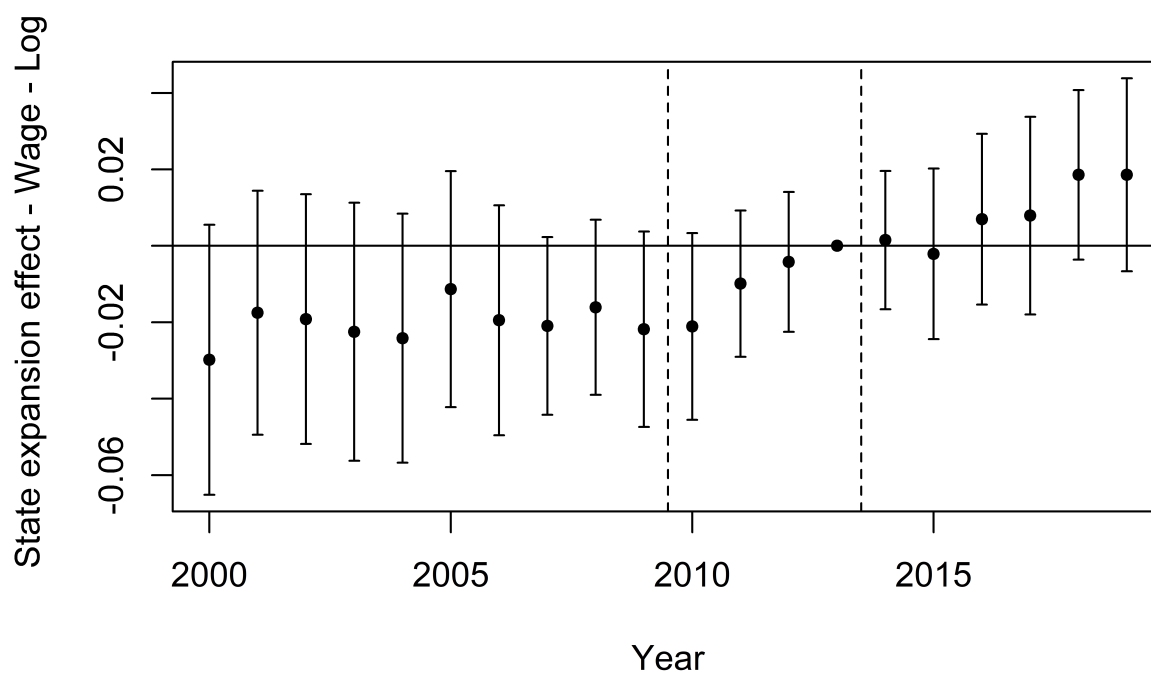
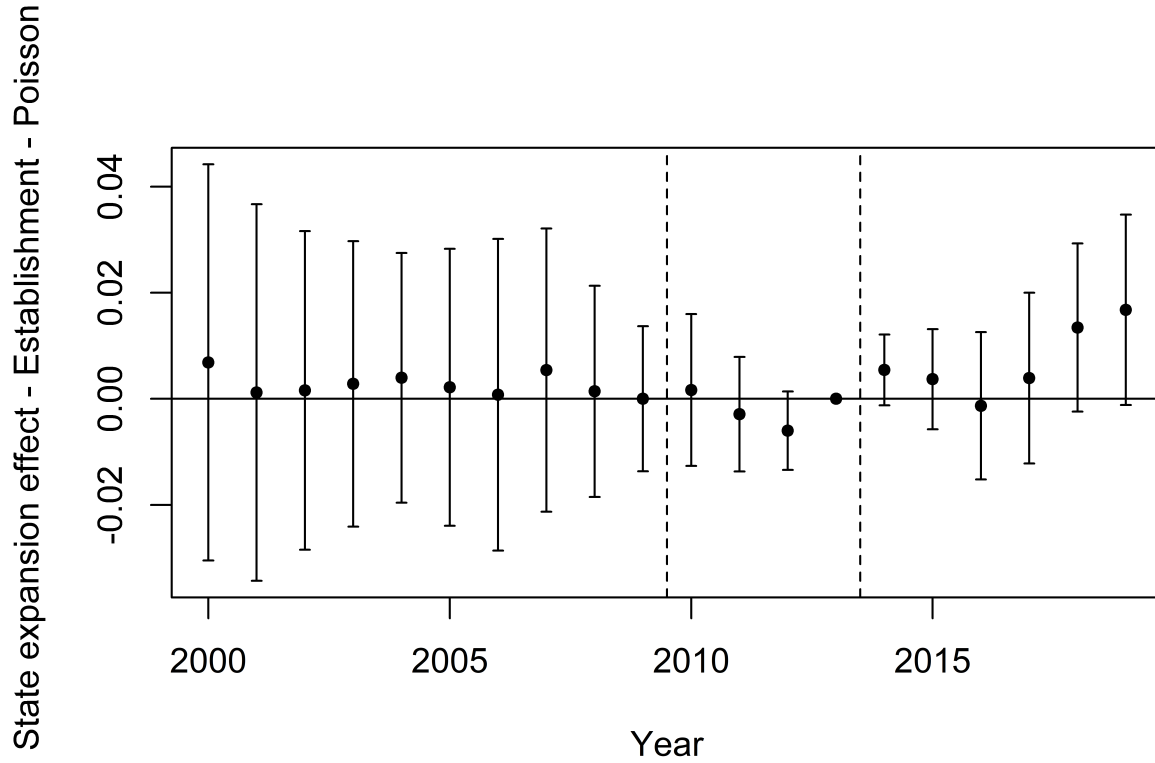


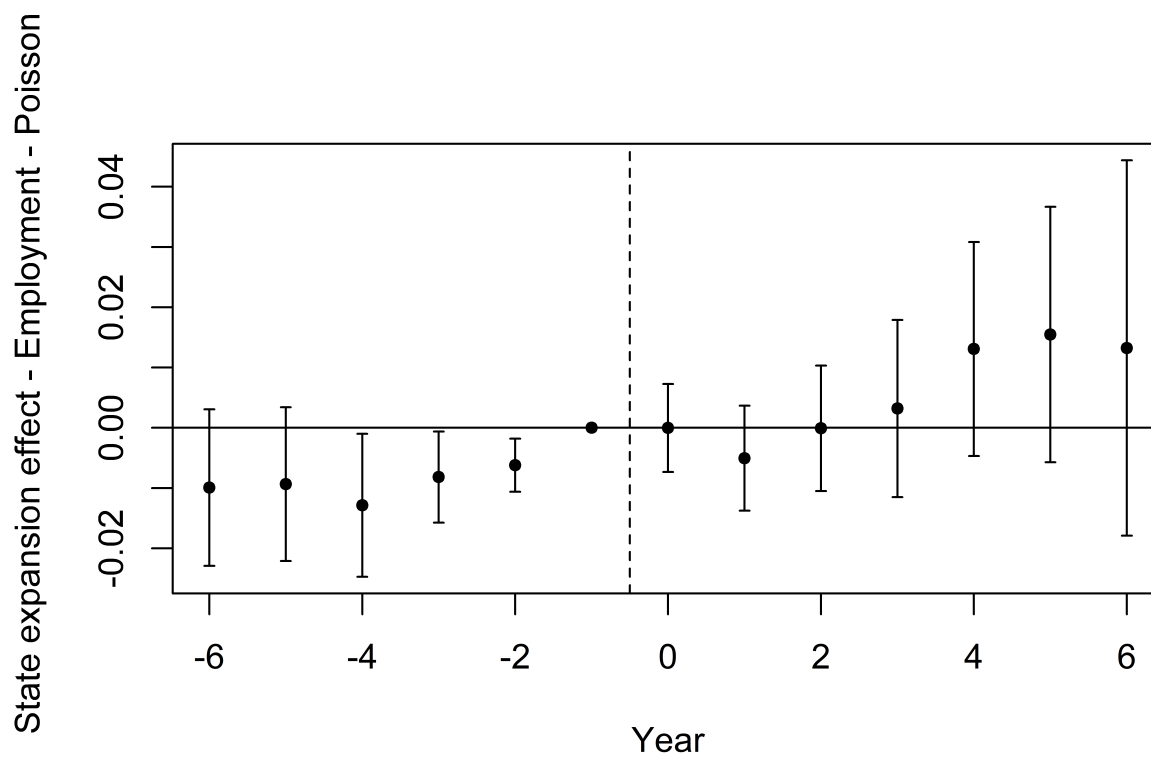
Figure 4: Medicaid expansion effect on county healthcare industry outcomes
(c) Healthcare establishments



Notes: The vertical lines between 2009 and 2010 and between 2013 and 2014 represent the passage of the ACA and the implementation of the 2014 Medicaid expansion, respectively. These event study plots are produced by using equation 2 and replacing the coefficient of interest with an interaction between year and a dummy variable which takes value 1 for healthcare industry observations in expansion counties and 0 otherwise. The coefficients of this estimation are plotted here for healthcare employment, wage, and establishment count. Wage here is calculated as average earning per employee.

Figure 5: Medicaid expansion effect: event time

(a) Healthcare worker employment



(b) Healthcare worker average wage

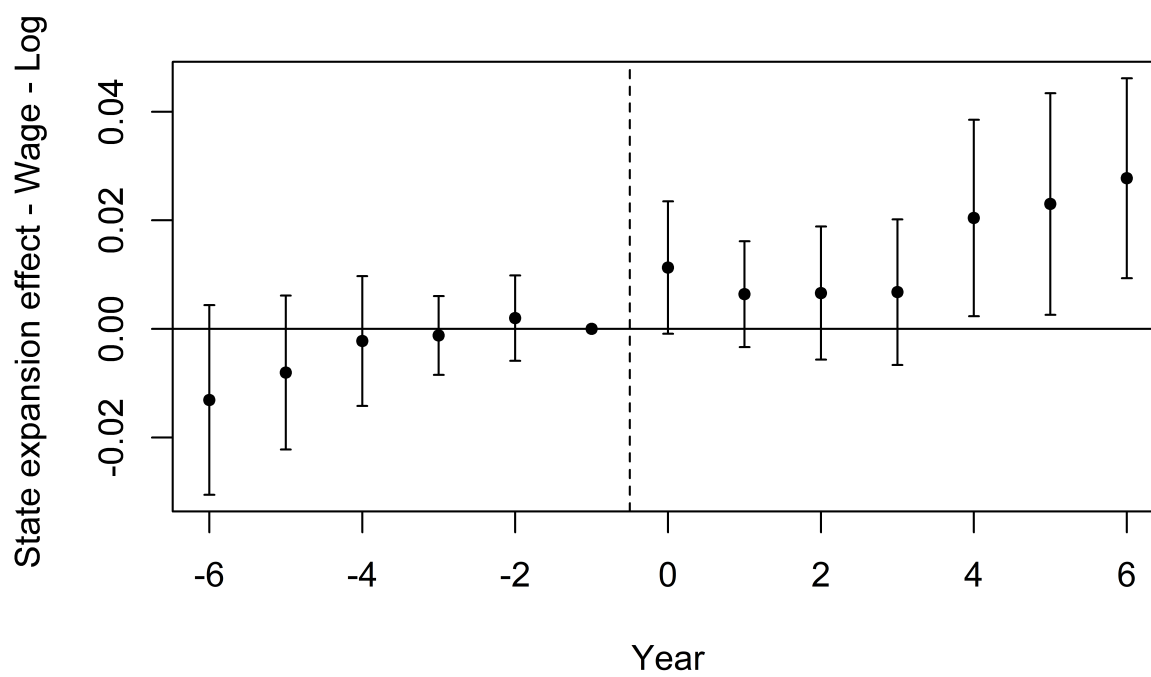
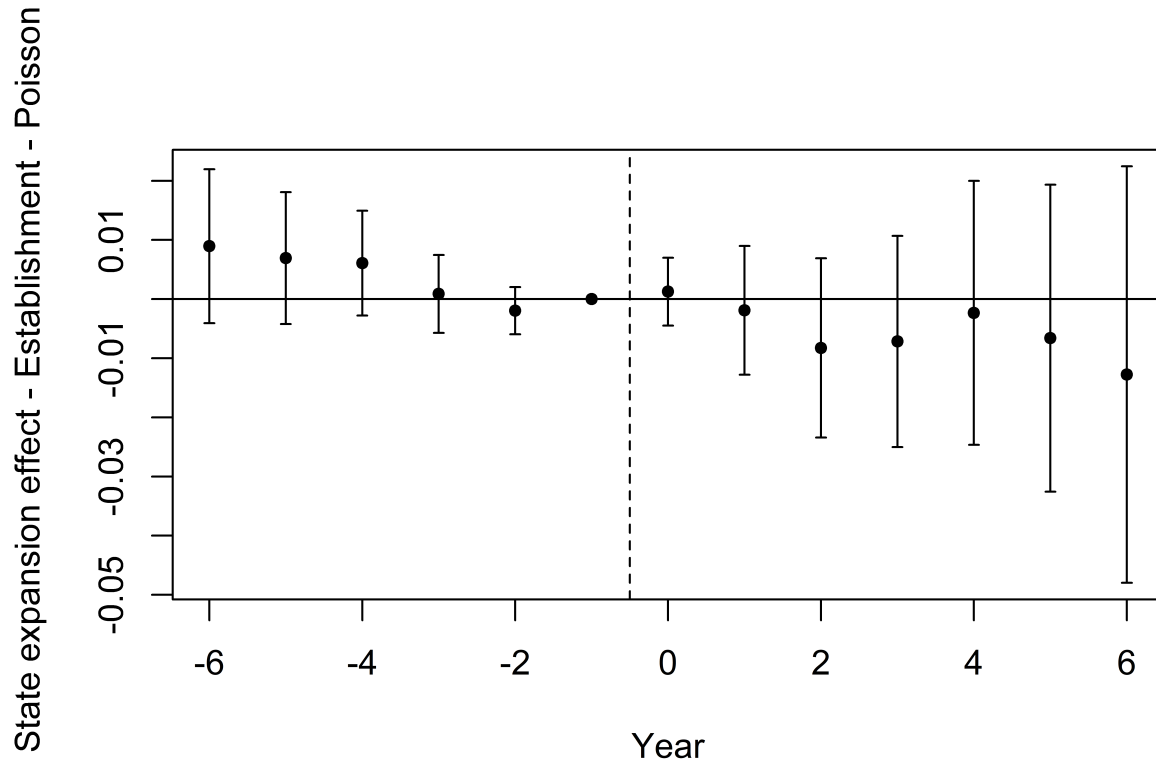


Figure 6: Medicaid expansion effect: event time

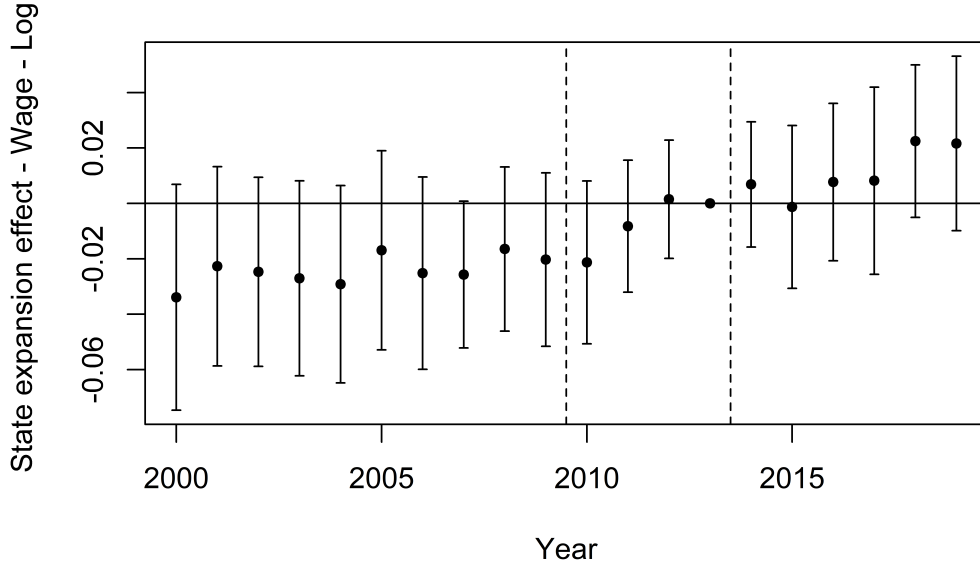
(c) Healthcare establishments



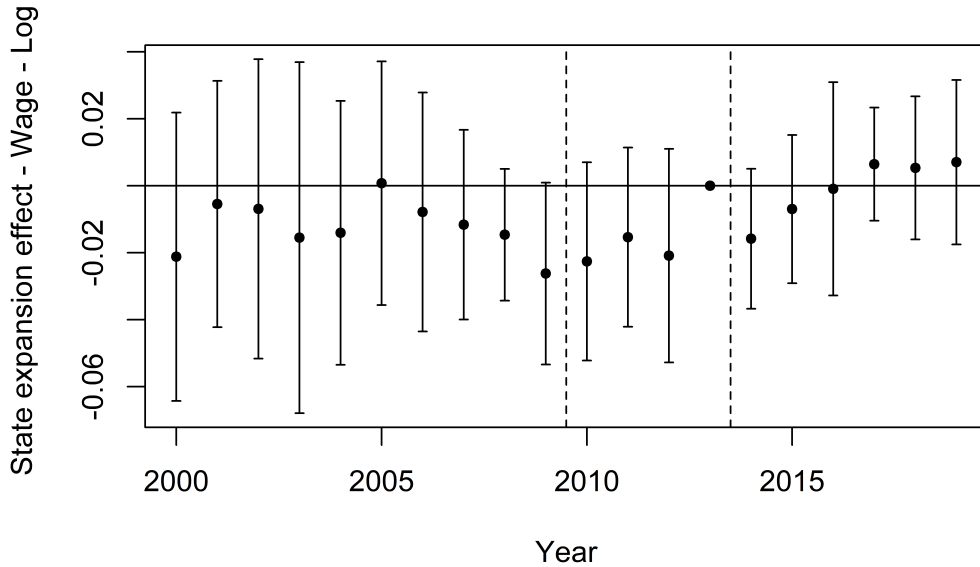
Notes: The event-time estimation adds into the sample many states which either expanded after 2014 but prior to 2019 and a handful of states which expanded Medicaid between 2010 and 2014. This estimation only includes states which were ultimately treated prior to 2019. States which never expanded are included in the estimation but are only used to estimate year fixed effects and other common coefficients, as they have no event to time.

Figure 7: Wage effects: urban vs rural population counties

(a) Small metro, micropolitan, and non-core counties



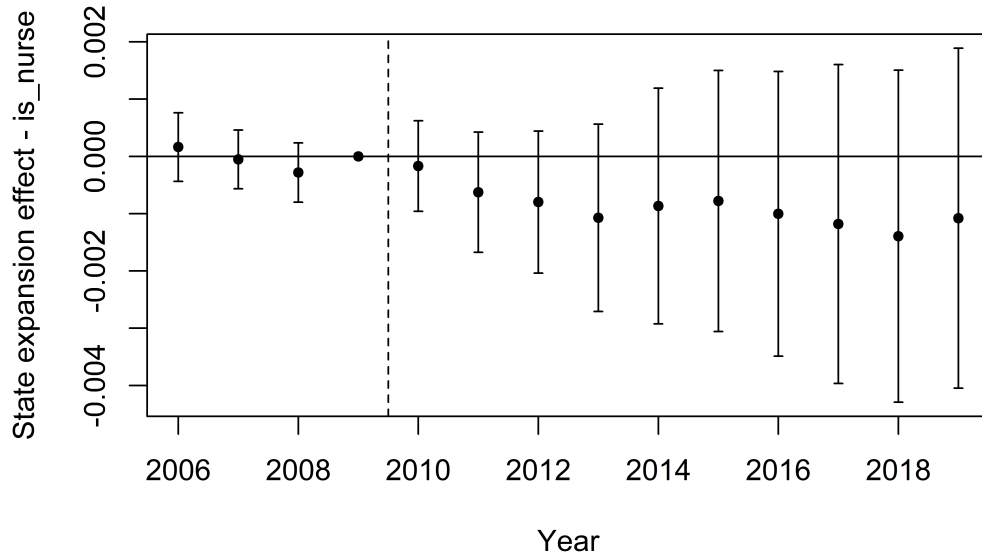
(b) Large central metro, large fringe metro, and medium metro counties



Notes: These event studies are estimated on CBP counties broken into two groups: the largest three county types by population and the smallest three county types by population. The counties are split by the urban/rural county designation of the census, not direct county population. Employment effects do not vary substantially, but wage effects do. See Appendix figure 12 for employment splits.

Figure 8: Expansion effects on workforce composition: event studies

(a) Nurses



(b) Physicians/Surgeons

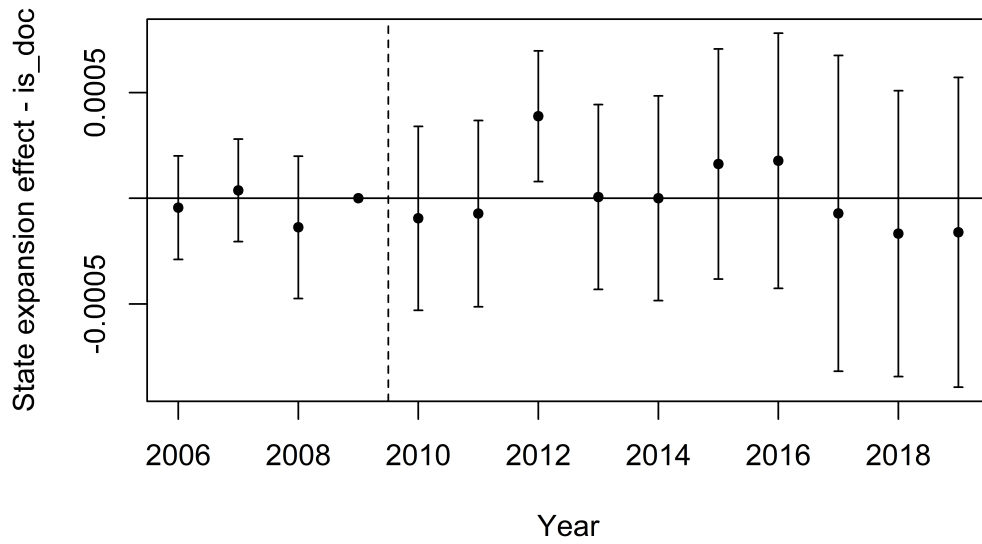
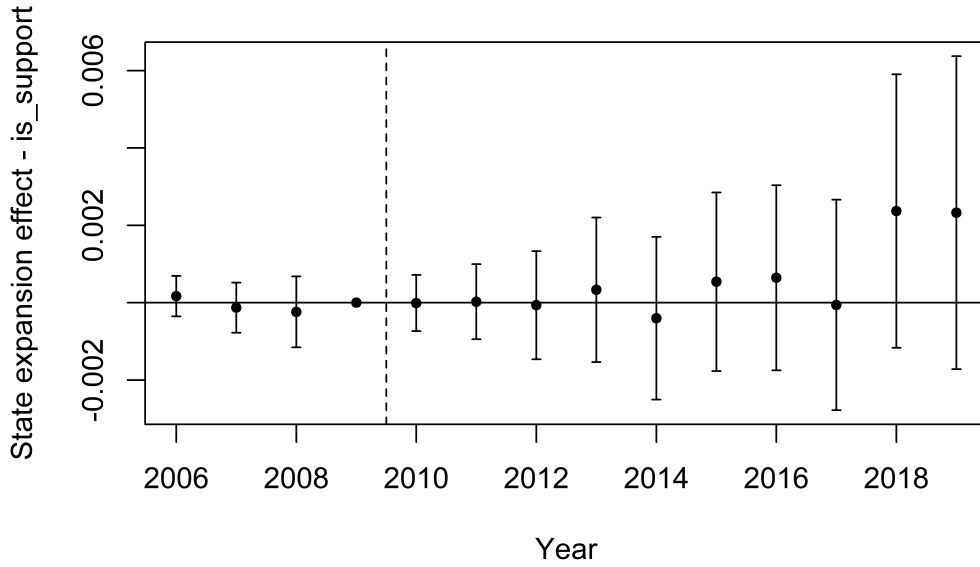
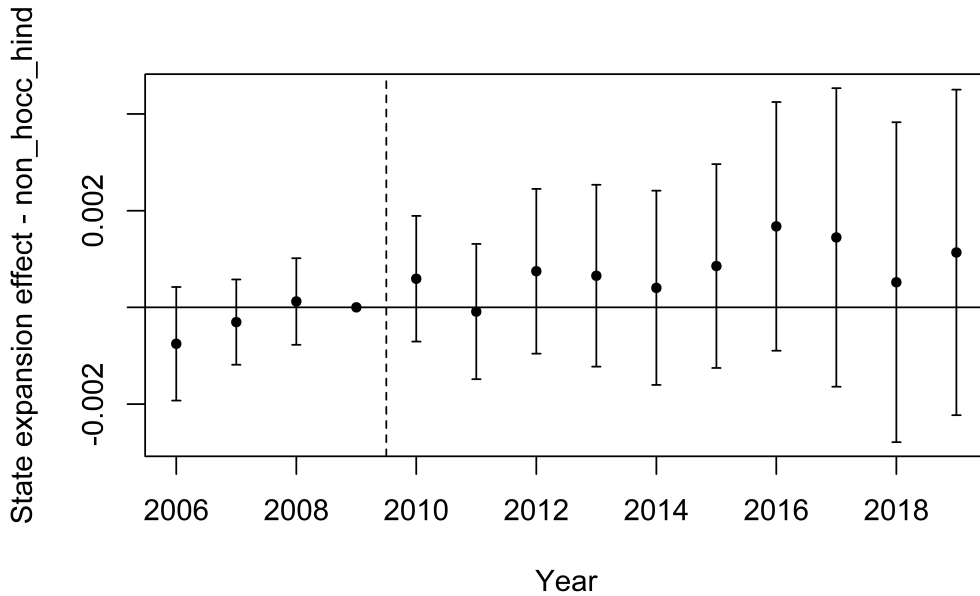


Figure 9: Expansion effects on workforce composition: event studies

(a) Healthcare support occupations



(b) Non-healthcare occupations in the healthcare industry



Notes: These event studies are estimated on the full set of workers in the ACS with difference in differences estimation. The dependent variable is whether the worker falls into the set of occupation codes and industry codes. Healthcare support occupations include medical assistants and home health aides, all occupation codes between 3600 and 3655. Non-healthcare occupation workers in the healthcare industry include janitors and administrative assistants and encompass all occupation codes outside of 3000 to 3655 within industry codes 7970 and 8290. See Table 8 for full period average effects.

Tables

Table 1: Summary statistics for Medicaid expansion and non-expansion states

	2009		2018	
	Expanded 2014	Never expanded	Expanded 2014	Never expanded
Number of states	15	16	15	16
Share white	0.81	0.75	0.79	0.73
Share Hispanic	0.12	0.17	0.14	0.20
Average individual income	25,147	23,714	31,930	29,847
Average hours worked	19.88	19.93	20.20	19.96
Share in healthcare industry	0.060	0.056	0.067	0.062
Share in healthcare occupation	0.042	0.040	0.054	0.049
Insured rate	0.856	0.810	0.926	0.865
Privately insured	0.678	0.633	0.675	0.648
Medicare	0.152	0.149	0.187	0.178
Medicaid	0.166	0.156	0.219	0.176

Table 2: Medicaid expansion effect, county business patterns

Dependent Variables: Model:	Employment (1) Poisson	Log average wage (2) OLS	Establishments (3) Poisson
<i>Variables</i>			
State expansion - healthcare	0.0295* (0.0152)	0.0246** (0.0110)	0.0058 (0.0112)
Mean(y)	13,725.2	3.438	886.5
<i>Fixed-effects</i>			
Medicaid expansion	Yes	Yes	Yes
Industry indicator-County FE	Yes	Yes	Yes
Industry indicator-Year FE	Yes	Yes	Yes
<i>Varying Slopes</i>			
State time trends	Yes	Yes	Yes
<i>Fit statistics</i>			
Observations	87,960	68,457	87,960
Counties	2,199	1,717	2,199

Clustered (fipstate) standard-errors in parentheses

*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Table 3: Expansion effect in event time

Dependent Variables: Model:	Employment (1) Poisson	Log average wage (2) OLS	Establishments (3) Poisson
<i>Variables</i>			
State expansion - healthcare	0.0199** (0.0098)	0.0183* (0.0100)	0.0125 (0.0164)
Mean(y)	18,426.3	3.464	1,189.9
<i>Fixed-effects</i>			
Medicaid expansion	Yes	Yes	Yes
expand_treated_et	Yes	Yes	Yes
Industry indicator-County FE	Yes	Yes	Yes
Industry indicator-Year FE	Yes	Yes	Yes
<i>Varying Slopes</i>			
State time trends	Yes	Yes	Yes
<i>Fit statistics</i>			
Observations	121,600	96,931	121,640
Counties	3,040	2,431	3,041

Clustered (fipstate) standard-errors in parentheses

*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Table 4: Medicaid expansion effect on employment by county geography

Dependent Variable:	Employment						
	Full sample	L central metro	L fringe metro	M metro	S metro	Micropolitan	Non-core
Model:	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>Variables</i>							
State expansion - healthcare	0.0295*	0.0196	0.0531	0.0054	0.0484	0.0380	0.0209
	(0.0152)	(0.0334)	(0.0337)	(0.0187)	(0.0319)	(0.0238)	(0.0361)
Mean(y)	13,725.2	315,620.2	28,128.1	27,292.5	12,203.6	5,962.2	1,497.6
<i>Fixed-effects</i>							
Medicaid expansion	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry indicator-County FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry indicator-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Varying Slopes</i>							
State time trends	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Fit statistics</i>							
Observations	87,960	1,280	8,280	10,200	9,560	19,600	39,040
Counties	2,199	32	207	255	239	490	976

Clustered (fipstate) standard-errors in parentheses

*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Table 5: Medicaid expansion effect on wage by county geography

Dependent Variable:	Log average wage						
	Full sample	L central metro	L fringe metro	M metro	S metro	Micropolitan	Non-core
Model:	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>Variables</i>							
State expansion - healthcare	0.0246** (0.0110)	0.0138 (0.0173)	-0.0042 (0.0152)	0.0262 (0.0166)	0.0367* (0.0180)	0.0268* (0.0152)	0.0286 (0.0171)
Mean(y)	3.438	3.788	3.522	3.491	3.492	3.435	3.363
<i>Fixed-effects</i>							
Medicaid expansion	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry indicator-County FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry indicator-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Varying Slopes</i>							
State time trends	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Fit statistics</i>							
Observations	68,457	1,280	7,494	9,076	8,288	16,622	25,697
Counties	1,717	32	188	227	208	417	645

Clustered (fipstate) standard-errors in parentheses

*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Table 6: Medicaid expansion effect on establishments by county geography

Dependent Variable:	Establishments						
	Full sample	L central metro	L fringe metro	M metro	S metro	Micropolitan	Non-core
Model:	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>Variables</i>							
State expansion - healthcare	0.0058 (0.0112)	-0.0227 (0.0243)	0.0132 (0.0266)	0.0190** (0.0097)	0.0230 (0.0272)	0.0029 (0.0150)	0.0518** (0.0249)
Mean(y)	886.5	16,658.5	1,970.1	1,742.9	846.1	447.8	146.0
<i>Fixed-effects</i>							
Medicaid expansion	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry indicator-County FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry indicator-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Varying Slopes</i>							
State time trends	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Fit statistics</i>							
Observations	87,960	1,280	8,280	10,200	9,560	19,600	39,040
Counties	2,199	32	207	255	239	490	976

Clustered (fipstate) standard-errors in parentheses

*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Table 7: County geographic variation in insurance and poverty

	Large central metro	Large fringe metro	Medium metro	Small metro	Micropolitan	Non-core
Urban/Rural	1	2	3	4	5	6
Counties	68	368	373	358	641	1338
Medicaid share 2013	0.165	0.121	0.157	0.158	0.175	0.177
Medicaid share 2018	0.196	0.144	0.187	0.188	0.208	0.211
Medicaid change 2013-2018	0.031	0.023	0.030	0.031	0.033	0.033
Share below 138 poverty	0.256	0.195	0.254	0.263	0.284	0.285
Share uninsured below 138	0.275	0.290	0.277	0.271	0.271	0.294
Population share	0.308	0.246	0.205	0.089	0.083	0.057

Table 8: Medicaid effect on workforce composition

Dependent Variables: Model:	Nurse (1)	Healthcare support job (2)	MD (3)	Non-healthcare occupation (4)
<i>Variables</i>				
Medicaid expansion	-0.0130 (0.0160)	-0.0431 (0.0379)	0.0172 (0.0461)	0.0036 (0.0227)
Mean(y)	0.0179	0.0167	0.0036	0.0300
<i>Fixed-effects</i>				
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
<i>Varying Slopes</i>				
State time trends	Yes	Yes	Yes	Yes
<i>Fit statistics</i>				
Observations	20,832,009	20,832,009	17,859,698	20,832,009

Clustered (abb) standard-errors in parentheses

*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Table 9: Healthcare worker income effect by worker education

Dependent Variables:	Income		Employed rate		Hours worked	
	Associates	Less than assoc.	Associates	Less than assoc.	Associates	Less than assoc.
Model:	(1)	(2)	(3)	(4)	(5)	(6)
	Poisson	Poisson	OLS	OLS	Poisson	Poisson
<i>Variables</i>						
State expansion - healthcare	0.0084	0.0145	-0.0005	-0.0010	0.0019	-0.0011
	(0.0110)	(0.0112)	(0.0011)	(0.0027)	(0.0024)	(0.0039)
Mean(y)	67,228.0	31,993.1	0.9651	0.9107	40.41	36.51
<i>Fixed-effects</i>						
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Medicaid expansion	Yes	Yes	Yes	Yes	Yes	Yes
Industry indicator-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
<i>Varying Slopes</i>						
State time trends	Yes	Yes	Yes	Yes	Yes	Yes
<i>Fit statistics</i>						
Observations	4,913,352	7,589,843	4,913,352	7,589,843	4,913,352	7,589,843

Clustered (abb) standard-errors in parentheses

*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Appendix A.

Table 10: Medicaid expansion effect, county business patterns, 2010 cutoff

Dependent Variables: Model:	Employment (1) Poisson	Log average wage (2) OLS	Establishments (3) Poisson
<i>Variables</i>			
State expansion - healthcare	0.0261 (0.0175)	0.0210 (0.0127)	0.0009 (0.0121)
Mean(y)	13,725.2	3.438	886.5
<i>Fixed-effects</i>			
Medicaid expansion	Yes	Yes	Yes
Industry indicator-County FE	Yes	Yes	Yes
Industry indicator-Year FE	Yes	Yes	Yes
<i>Varying Slopes</i>			
State time trends	Yes	Yes	Yes
<i>Fit statistics</i>			
Observations	87,960	68,457	87,960
Counties	2,199	1,717	2,199

Clustered (fipstate) standard-errors in parentheses

*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Table 11: CBP population-weighted expansion effect

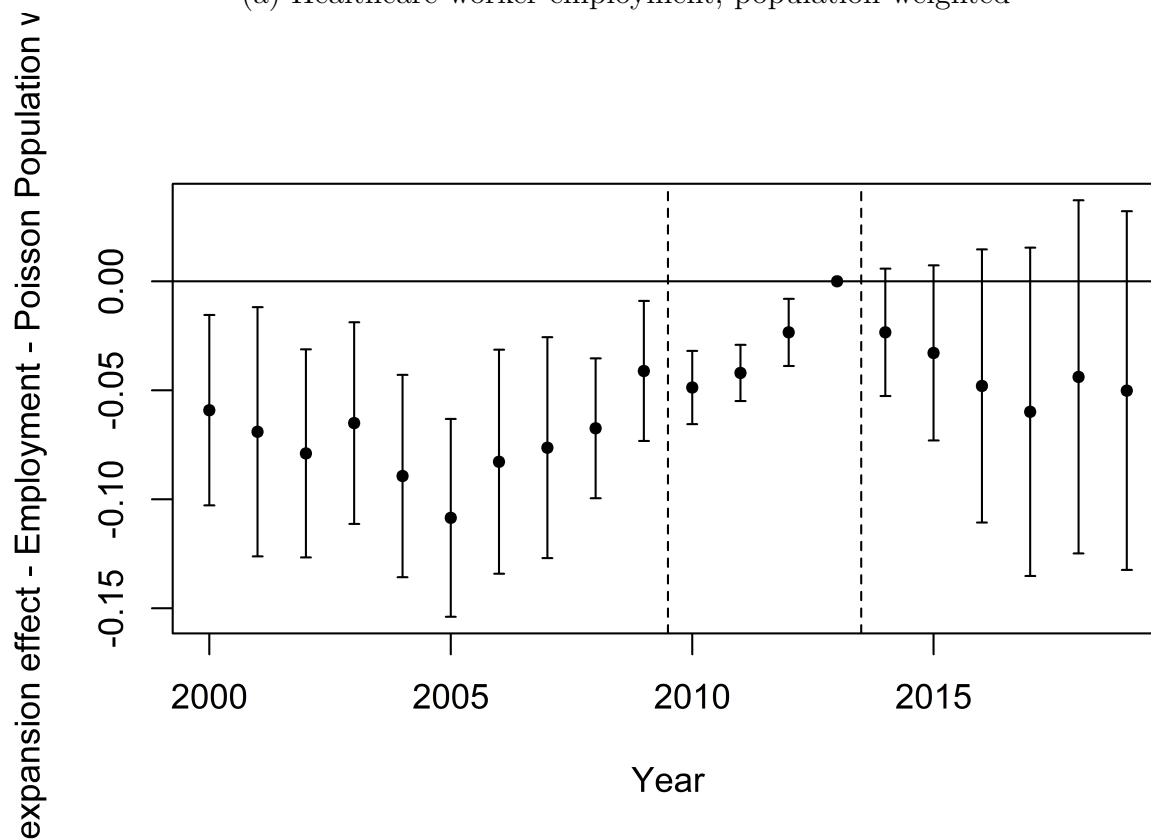
Dependent Variables: Model:	Employment (1) Poisson	Log average wage (2) OLS	Establishments (3) Poisson
<i>Variables</i>			
State expansion - healthcare	0.0161 (0.0345)	0.0098 (0.0123)	0.0003 (0.0246)
Mean(y)	13,725.2	3.438	886.5
<i>Fixed-effects</i>			
Medicaid expansion	Yes	Yes	Yes
Industry indicator-County FE	Yes	Yes	Yes
Industry indicator-Year FE	Yes	Yes	Yes
<i>Varying Slopes</i>			
State time trends	Yes	Yes	Yes
<i>Fit statistics</i>			
Observations	87,960	68,457	87,960
Counties	2,199	1,717	2,199

Clustered (fipstate) standard-errors in parentheses

*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Figure 10: Medicaid expansion effect, population weighted

(a) Healthcare worker employment, population-weighted



(b) Healthcare worker average wage, population-weighted

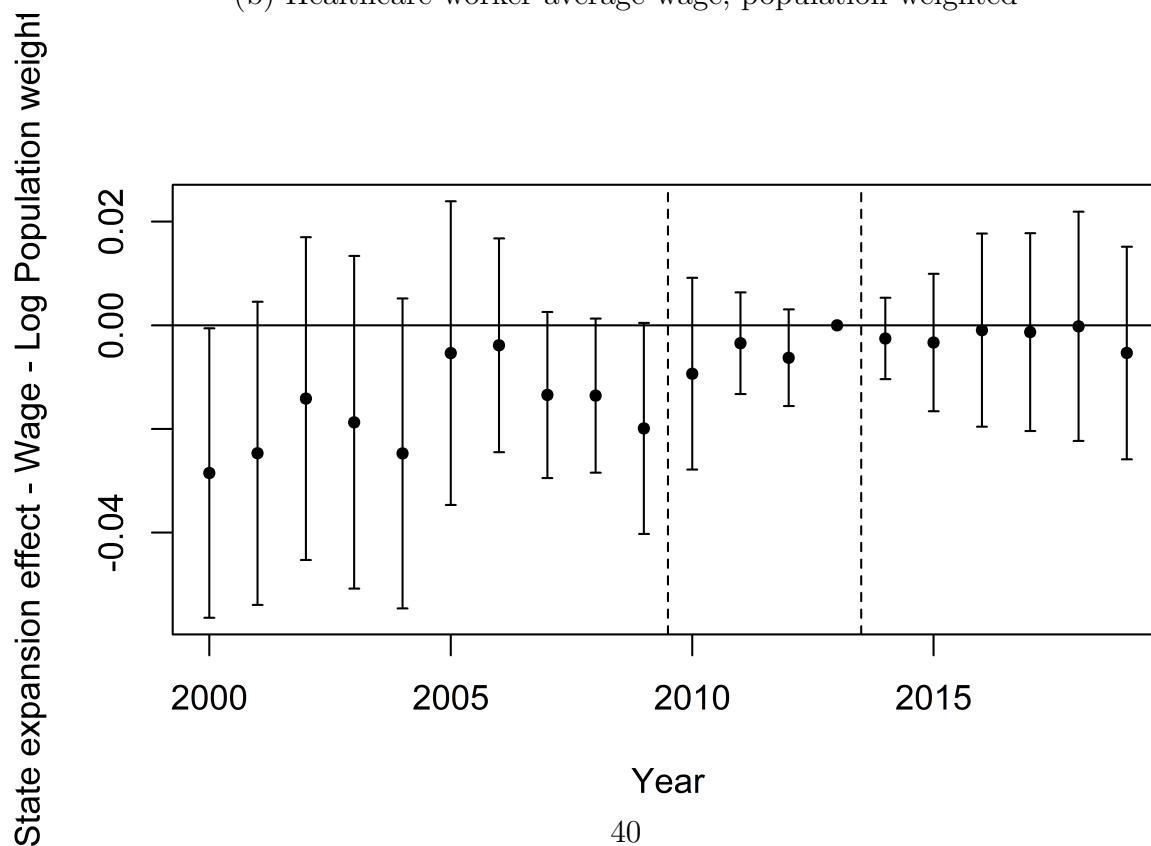
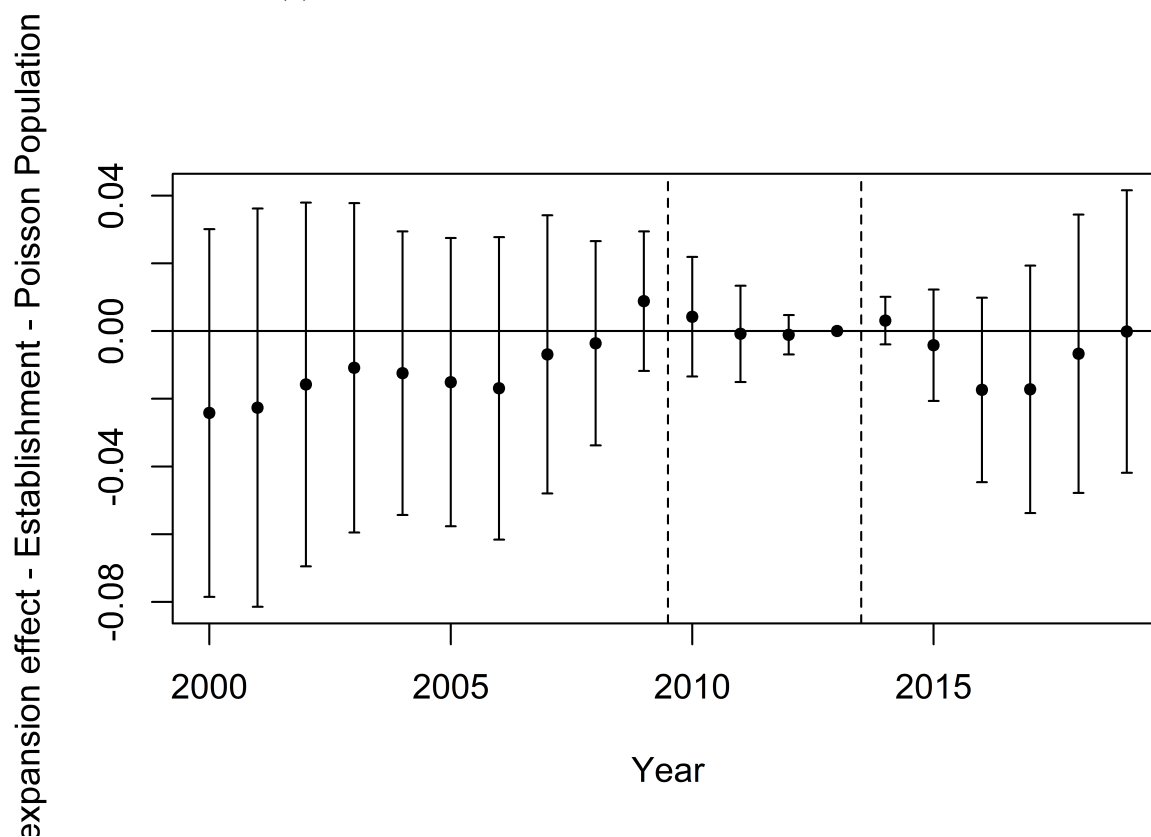


Figure 11: Medicaid expansion effect, population weighted

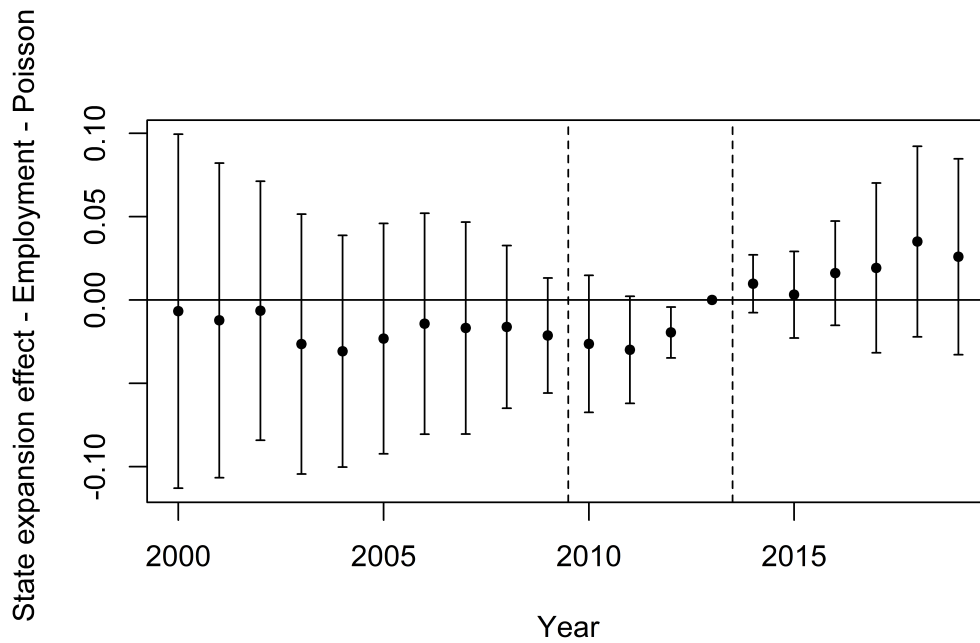
(c) Healthcare establishments, population-weighted



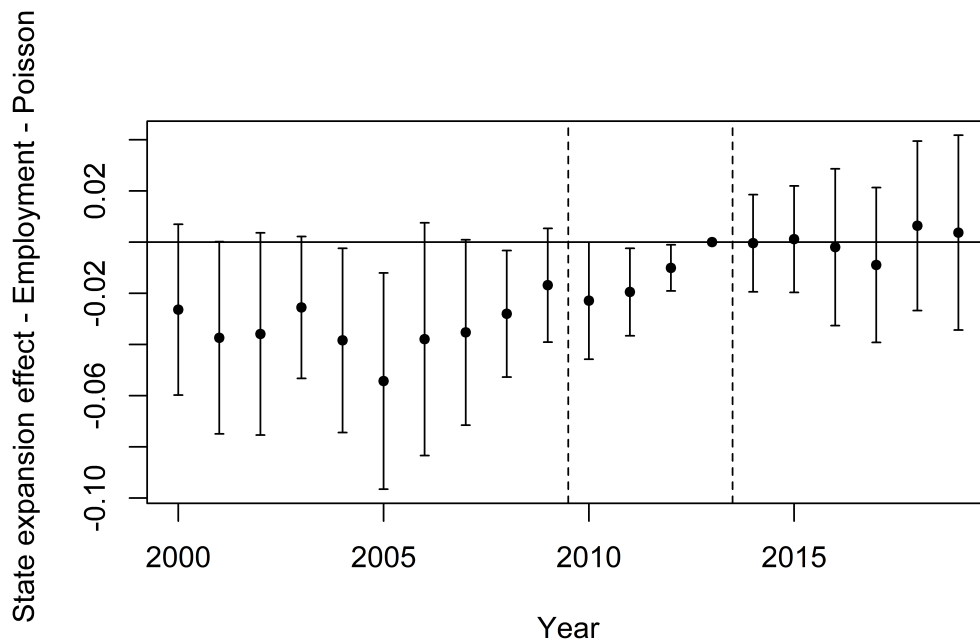
Notes: These event studies are equivalent to the core specification except that the counties in the regression are weighted by their 2013 population rather than weighting them equally.

Figure 12: Employment effects: urban vs rural population counties

(a) Small metro, micropolitan, and non-core counties



(b) Large central metro, large fringe metro, and medium metro counties



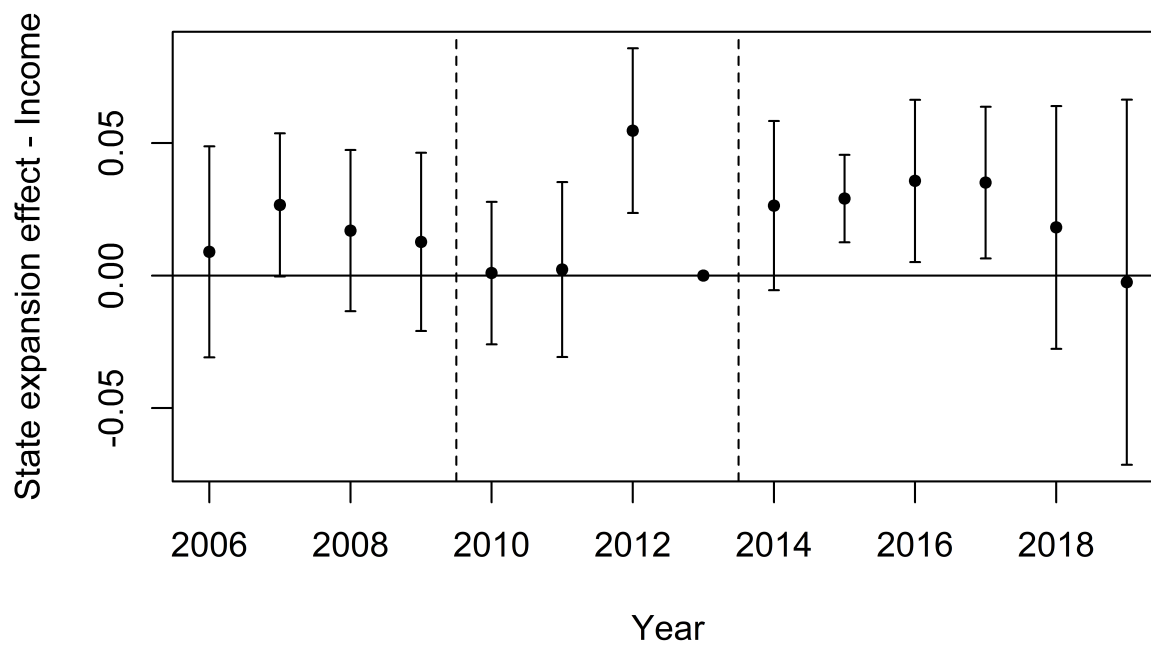
Notes: These event studies are estimated on CBP counties broken into two groups: the largest three county types by population and the smallest three county types by population. The counties are split by the urban/rural county designation of the census, not direct county population.

Table 12: Medicaid expansion effect, ACS worker effects

Dependent Variables:	Income	Employed rate	Hours worked
Model:	(1)	(2)	(3)
	Poisson	OLS	Poisson
<i>Variables</i>			
State expansion - healthcare	0.0053 (0.0112)	-0.0004 (0.0018)	0.0011 (0.0023)
Mean(y)	45,839.3	0.9321	38.04
<i>Fixed-effects</i>			
State FE	Yes	Yes	Yes
Medicaid expansion	Yes	Yes	Yes
Industry indicator-Year FE	Yes	Yes	Yes
<i>Varying Slopes</i>			
State time trends	Yes	Yes	Yes
<i>Fit statistics</i>			
Observations	12,503,195	12,503,195	12,503,195
<i>Clustered (abb) standard-errors in parentheses</i>			
<i>Signif. Codes: ***: 0.01, **: 0.05, *: 0.1</i>			

Figure 13: Medicaid expansion effect on healthcare worker outcomes

(a) Healthcare worker income



(b) Healthcare worker employed rate

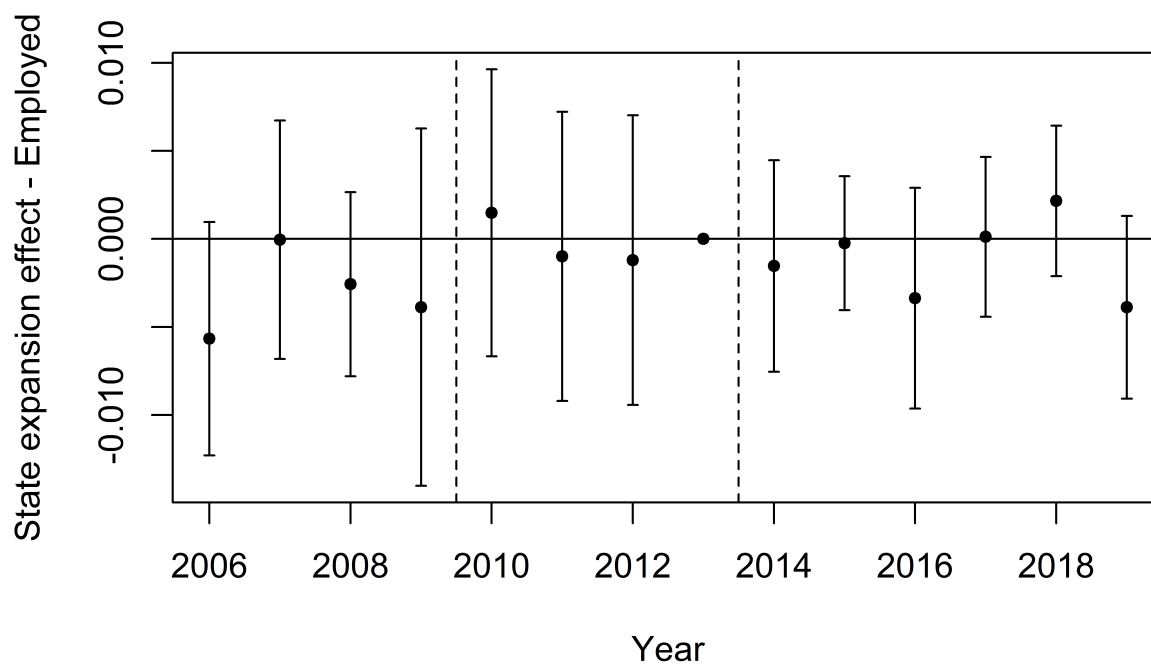
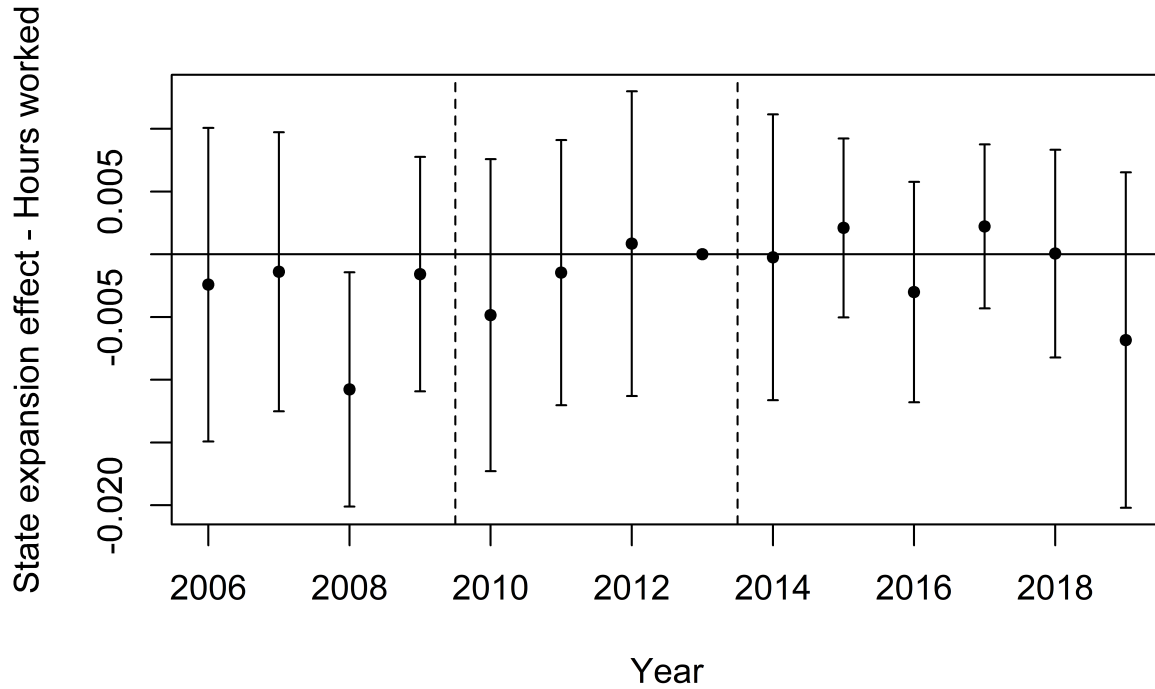


Figure 14: Medicaid expansion effect on healthcare worker outcomes

(c) Healthcare hours worked



Notes: The vertical lines between 2009 and 2010 and between 2013 and 2014 represent the passage of the ACA and the implementation of the 2014 Medicaid expansion, respectively. These event study plots are produced by using equation 2 and replacing the coefficient of interest with an interaction between year and a dummy variable which takes value 1 for healthcare industry observations in expansion states and 0 otherwise. The geographic area for fixed effects and clustering is state. The coefficients of this estimation are plotted here for healthcare worker income, employed rate, and hours worked. Employed rate here is the probability that a worker in the survey coded as having a healthcare occupation is employed.

Table 13: Medicaid expansion effect on healthcare occupation worker income

Dependent Variable:	Income					
	Full sample	Large central metro	Large fringe metro	Medium metro	Small metro	Micropolitan
Model:	(1)	(2)	(3)	(4)	(5)	(6)
<i>Variables</i>						
State expansion - healthcare	0.0035 (0.0220)	-0.0040 (0.0326)	-0.0180 (0.0172)	0.0206 (0.0229)	0.0557* (0.0332)	0.1985** (0.0836)
Mean(y)	49,655.7	51,498.1	54,648.3	44,053.5	41,967.7	38,593.9
<i>Fixed-effects</i>						
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Medicaid expansion	Yes	Yes	Yes	Yes	Yes	Yes
Industry indicator-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
<i>Varying Slopes</i>						
State time trends	Yes	Yes	Yes	Yes	Yes	Yes
<i>Fit statistics</i>						
Observations	6,541,123	2,732,475	1,672,343	1,553,937	522,809	59,559

Clustered (abb) standard-errors in parentheses

*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Table 14: Medicaid expansion effect on healthcare occupation worker employed rate

Dependent Variable:	Employed rate					
	Full sample	Large central metro	Large fringe metro	Medium metro	Small metro	Micropolitan
Model:	(1)	(2)	(3)	(4)	(5)	(6)
<i>Variables</i>						
State expansion - healthcare	0.0014 (0.0026)	0.0009 (0.0027)	0.0009 (0.0041)	0.0030 (0.0043)	0.0045 (0.0073)	-0.0304* (0.0181)
Mean(y)	0.9289	0.9267	0.9337	0.9278	0.9322	0.9268
<i>Fixed-effects</i>						
PUMA FE	Yes	Yes	Yes	Yes	Yes	Yes
Medicaid expansion	Yes	Yes	Yes	Yes	Yes	Yes
Industry indicator-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
<i>Varying Slopes</i>						
State time trends	Yes	Yes	Yes	Yes	Yes	Yes
<i>Fit statistics</i>						
Observations	10,422,133	4,937,585	2,443,326	2,416,880	561,282	63,060
PUMAs	291	37	89	98	65	9

Clustered (abb) standard-errors in parentheses

*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Table 15: Medicaid expansion effect on healthcare occupation worker hours worked

Dependent Variable:	Hours worked					
	Full sample	Large central metro	Large fringe metro	Medium metro	Small metro	Micropolitan
Model:	(1)	(2)	(3)	(4)	(5)	(6)
<i>Variables</i>						
State expansion - healthcare	0.0016 (0.0045)	0.0014 (0.0058)	0.0031 (0.0093)	0.0003 (0.0072)	0.0083 (0.0124)	0.0149 (0.0278)
Mean(y)	38.16	38.32	38.50	37.63	37.62	37.46
<i>Fixed-effects</i>						
PUMA FE	Yes	Yes	Yes	Yes	Yes	Yes
Medicaid expansion	Yes	Yes	Yes	Yes	Yes	Yes
Industry indicator-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
<i>Varying Slopes</i>						
State time trends	Yes	Yes	Yes	Yes	Yes	Yes
<i>Fit statistics</i>						
Observations	10,422,133	4,937,585	2,443,326	2,416,880	561,282	63,060
PUMAs	291	37	89	98	65	9

Clustered (abb) standard-errors in parentheses

*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*