

Medicaid Expansion and Child
Maltreatment Rates: A “Natural Experiment”

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Abstract

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Background

Child maltreatment impacts a large number of children and has negative consequences through adulthood. Only a few programs and policies that aim to prevent child physical abuse and neglect have proven to be consistently effective. Policies and programs that address some of the risk factors for physical abuse and neglect (e.g., poverty, limited parental access to physical and mental health care) have been proposed as a means to prevent child maltreatment indirectly. The recent Patient Protection and Affordable Care Act (ACA) Medicaid expansion has been associated with improved adult financial stability and access to physical and mental health care. By impacting these parental factors, the Medicaid expansion may have also impacted child physical abuse and neglect outcomes. Since Medicaid expansion did not happen in all states or at the same time, this allowed for a comparison not just of maltreatment outcomes within states that expanded Medicaid before and after the expansion occurred, but

also for a comparison of the same maltreatment outcomes between states that did expand Medicaid and those that did not as part of a “natural experiment.”

Objective

Determine whether the ACA Medicaid expansion was associated with a decreased rate of child physical abuse and neglect.

Methods

We conducted an observational study using data from the National Child Abuse and Neglect Data System (NCANDS) Child Files to evaluate rates of reported abuse and neglect for children under the age of 6 years over a 7-year period, from 2010 through 2016. We also used data available through the Henry J. Kaiser Family Foundation to evaluate state-level changes in Medicaid coverage proportions for parents as a possible intermediate step in the association between Medicaid expansion policies and child maltreatment outcomes. A difference-in-difference analysis was conducted in which the change in rates of physical abuse and neglect before and after expansion of Medicaid in states where Medicaid expansion occurred were compared to the change in rates seen in states that did not expand Medicaid on or after January 1st 2014 controlling for several state-level measures including unemployment and teenage birth rates.

Results

Medicaid coverage for adults with dependent children increased after 2014 by 2.3% in the states that did not expand Medicaid and by 3.7% in the states that did. The states that did not expand Medicaid saw a decrease in the Medicaid eligibility cutoff for parents of 11 percentage points of the FPL whereas the states that did expand saw the eligibility cutoff increase by 36.9 percentage points of the FPL. The proportion of parents covered by Medicaid was found to increase annually ($p=0.01$) and was positively associated with Medicaid expansion status ($p=0.04$). When comparing the years 2013 and 2016, Medicaid expansion was found to be associated with a significant increase in %FPL Medicaid eligibility ($p<0.01$). There was not a

statistically significant association between having expanded Medicaid and the combined rate of physical abuse and neglect or the rate of physical abuse. After adjusting for several covariables, having a Medicaid expansion policy was associated with having on average 120 fewer reported neglect cases per 100,000 children (-120.1 per 100,000, p-value = 0.02).

Conclusions

The association between Medicaid expansion and a relatively lower rate of child neglect reports indicates that the ACA may have had far-reaching impacts on children beyond simply providing health insurance to a larger portion of the American population. Our findings may support utilizing social policies as a means of preventing child neglect.

Introduction

In 1998, researchers at Kaiser Permanente's Health Appraisal Clinic in San Diego found that adults who had experienced adverse events in childhood were at greater risk of developing several diseases in adulthood including depression, heart disease, and cancer.¹ Many studies since then have validated these findings and the number of associated adverse outcomes has grown.^{2,3} Five out of the ten events included on the current Adverse Childhood Experience (ACE) screening questionnaire developed from the original study relate to child maltreatment, a broad term that encompasses physical, sexual, and emotional abuse as well as neglect.⁴

According to the Centers for Disease Control and Prevention (CDC), one year's worth of confirmed cases of child maltreatment costs the United States \$124 billion, the medical portion of which is included in the \$3 trillion spent on healthcare each year.⁵⁻⁷ The lifetime cost per maltreatment victim is \$210,012, over \$43,000 of which is due to direct medical costs. These costs are significantly higher with more severe cases of maltreatment. One study found that the abuse-related medical costs for a victim of abusive head trauma in the 4 years following diagnosis were estimated to be \$47,952 per child.⁸ But these numbers only account for confirmed victims. Child Protective Services receives over 3 million referrals from the community each year representing about 5% of the total child population.⁹ But once unreported cases are added, it is estimated that 15.2% of children in the United States experience caregiver maltreatment each year.¹⁰

Much work has been done by child abuse prevention experts and advocates in medical and community settings to develop programs in order to reduce child maltreatment's significant burden on children, families, and society. Only a few programs, however, have been found to be consistently effective at reducing the rates of abuse or neglect.¹¹⁻¹³ Policies and programs that address some of the risk factors for physical abuse and neglect (e.g., poverty, limited

parental access to physical and mental health care) have been proposed as a means to prevent child maltreatment indirectly.¹⁴ One study demonstrated that the paid family leave policy in California that took effect in 2004 was associated with a significant reduction in the rate of abusive head trauma over seven years when compared to states that did not have similar leave policies.¹⁵ Another study showed that policies relating to child care access and continuity of child health care were also associated with decreased child maltreatment rates over a ten-year period.¹⁶

On January 1, 2014, 24 states and the District of Columbia expanded their Medicaid programs to include all adults with an annual income of up to 138% of the federal poverty level (Figure 1).^{17,18} Seven other states expanded their programs at a later date, between April 2014 and July 2016.¹⁹ Although originally intended to rollout nationwide, the U.S. Supreme Court determined that states could opt out, and 19 states had chosen to do so by the end of 2016.²⁰ The Medicaid expansion was credited in 2015 with expanding coverage to 11 million adults.²¹ This increase in medical insurance coverage has been shown to have had a positive impact on financial stability and several health outcomes in the lower-income population.²²⁻²⁴ The proportion of uninsured parents living in states with Medicaid expansions dropped 33% from 2013 to 2014.²⁵ Prior to the ACA, one study showed that Medicaid expansions between 1997 and 2009 resulted in the improvement of mental health status specifically in low-income parents.²⁶

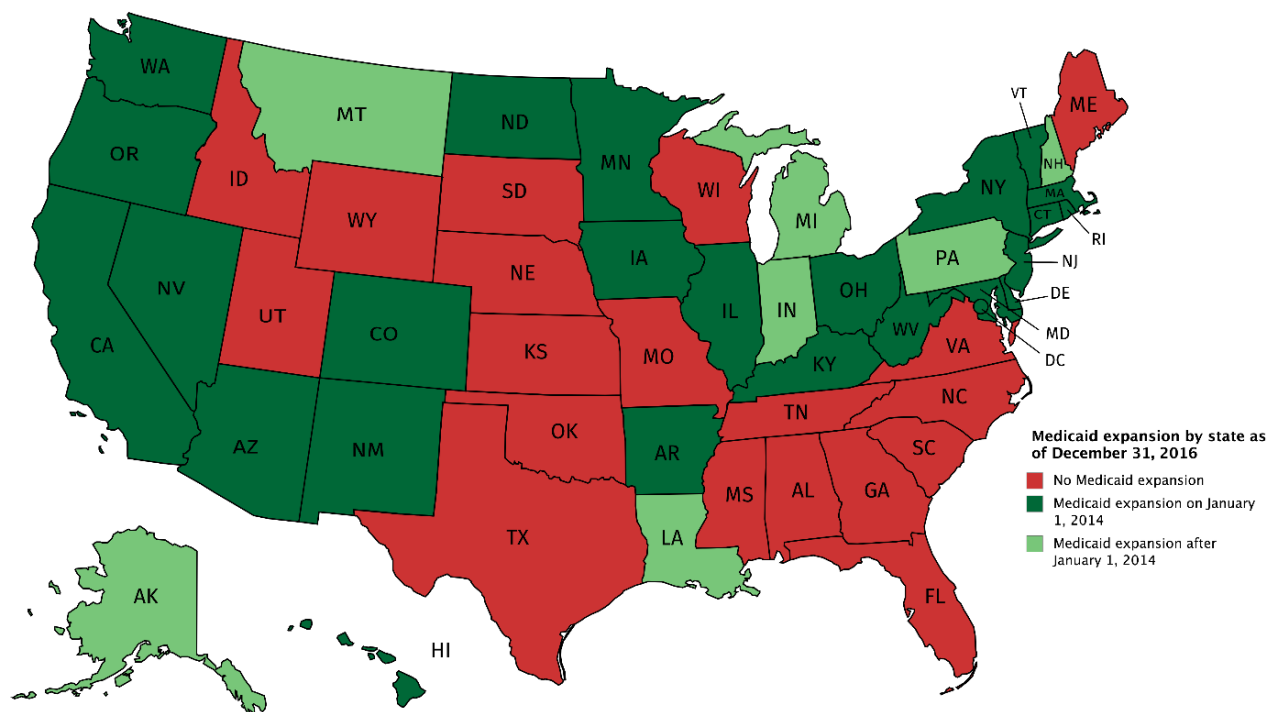


Figure 1: Medicaid expansion status by state

The findings from these studies suggest that the Medicaid expansion impacted parents’ financial stability and access to physical and mental health care. Since these are important risk factors for maltreatment, the Medicaid expansion may have also impacted child maltreatment outcomes including physical abuse and neglect (Figure 2). Since Medicaid expansion did not happen in all states or at the same time, this allows for a comparison not just of maltreatment outcomes within states that expanded Medicaid before and after the expansion occurred, but also for a comparison of the same maltreatment outcomes between states that did expand Medicaid and those that did not as part of a “natural experiment.”

In this study, in order to estimate the association between a state expanding Medicaid and the rate of child abuse and neglect, we conducted a difference-in-difference analysis. We

hypothesized that there would be an association between state expansion of Medicaid and lower rates of child abuse and neglect relative to states that did not expand Medicaid.



Figure 2: Conceptual model with proposed mechanism through which the Medicaid expansion might lead to reductions in child maltreatment

Methods

Data and sample

We used demographic and maltreatment data from the National Child Abuse and Neglect Data System (NCANDS) Child Files. This administrative dataset includes child-level data for all child maltreatment reports investigated by Child Protective Services in all 50 states and the District of Columbia. The Child Files are maintained and distributed by the National Data Archive on Child Abuse and Neglect (NDACAN, Ithaca, NY). We included data for the years 2010 through 2016 in order to capture trends in the maltreatment rates for several years before and after Medicaid expansion. 2016 was used at the cutoff for the study as this was the most recent year for which there was complete data for the exposure, outcomes, and covariables. A directed acyclic graph is included in Figure 3 to illustrate the relationships between the exposure, outcomes, and covariables.

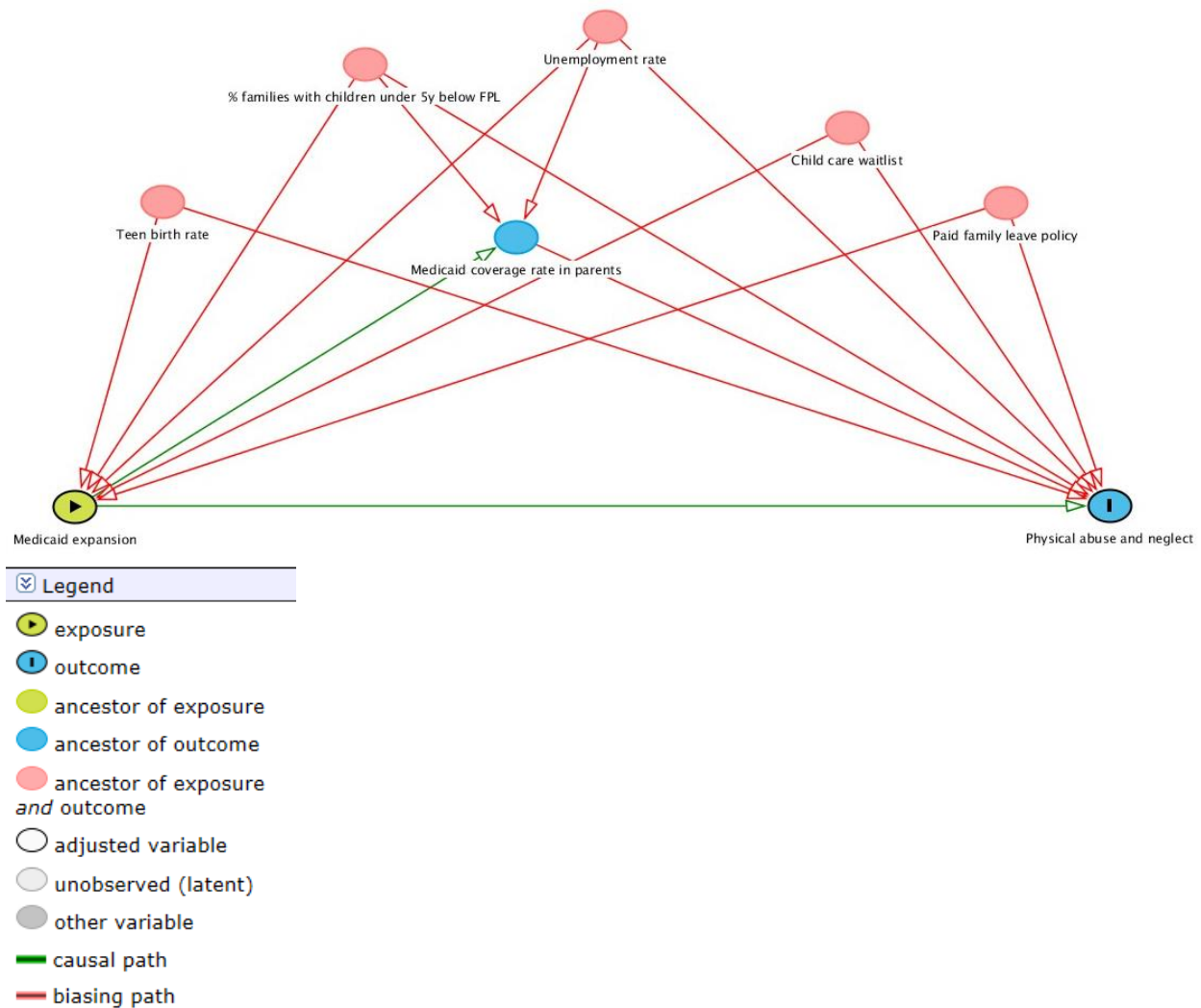


Figure 3: The Directed Acyclic Graph (DAG) demonstrates the proposed associations between the exposure, outcomes, and confounders. FPL stands for federal poverty level.

Exposure

The exposure of interest was whether a state opted to expand Medicaid on or after January 1st 2014. State-level exposure status was determined based on Medicaid expansion information available through the Henry J. Kaiser Family Foundation (KFF).¹⁷ KFF Medicaid expansion data has been used previously in other studies looking at expansion outcomes by state.^{19,24} Information about the income eligibility for Medicaid for parents of dependent children as expressed as a percentage cutoff of the federal poverty level in each state and for each year was obtained from KFF.²⁷ For states that expanded Medicaid, but did so after January 1, 2014,

we included them only in the expanded group for the time period in which they actually had expanded Medicaid.

Outcome

The primary outcome using NCANDS data was the incidence rate of screened-in referrals for physical abuse or neglect per 100,000 children under the age of 6 years per year in each state. These are the referrals made to Child Protective Services that have met criteria at intake indicating that an investigation is indicated. Once an investigation is complete, the concern for maltreatment may be found to be substantiated, unsubstantiated, or several disposition categories in-between. We included all screened-in referrals instead of only including substantiated cases. This decision was made based on prior research indicating that including cases that were deemed unsubstantiated provides a more accurate estimate for child maltreatment.¹⁶ The screened-in referrals were stratified by maltreatment type (physical abuse or neglect). We excluded sexual abuse as its risk factors are somewhat different than for physical abuse or neglect.²⁸ We also excluded emotional abuse because there is not currently a well-accepted definition for it and it is not well-captured in most datasets.²⁹ Maltreatment deaths were also excluded as state identifier data are masked in NCANDS for all cases resulting in death such that we were unable to determine the exposure status for those cases. We used the Centers for Disease Control and Prevention Bridged-race population estimates to determine the child population by state and by year.³⁰

Intermediate outcome

We used data available through the Henry J. Kaiser Family Foundation on the estimated number of adults with dependent children who have insurance coverage by state. In order to determine the impact of Medicaid expansion policies on Medicaid coverage among parents in each state, a possible intermediate step in the association between Medicaid expansion policies

and child maltreatment outcomes (Figure 3).³¹ The Kaiser Family Foundation estimates are based on additional analysis of the yearly U.S. Census Bureau's Current Population Survey and the Annual Social and Economic Supplements.

Covariates

We included the following variables as possible confounders, depicted as red ovals in the directed acyclic graph in Figure 3.

- 1) State paid family leave policy status and date of effect was determined based on data from the National Partnership for Women & Families.³²
- 2) State unemployment proportion was obtained from data from the U.S. Bureau of Labor Statistics.³³
- 3) State teenage birth rate data was obtained from the Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System.³⁴
- 4) State percentage of families with children under the age of 5 years living below the federal poverty level was determined using the American Community Survey estimates from the United States Census Bureau.³⁵
- 5) Child care wait list data were obtained from the National Women's Law Center.³⁶

Analysis

We calculated descriptive statistics to demonstrate the characteristics of the expansion in expansion and non-expansion states over the time period. To compare the change in physical abuse and neglect reporting rates in states that expanded Medicaid versus those that did not over the seven-year period of interest, we also conducted a difference-in-difference analysis.

with linear mixed effects models. A random intercept and autoregressive covariance structure was employed to account for repeated measures over time within each state:

$$\text{Unadjusted: } Y = \beta_0 + \beta_1 * \text{exp} + \beta_2 * \text{year} + \gamma$$

$$\text{Adjusted: } Y = \beta_0 + \beta_1 * \text{exp} + \beta_2 * \text{year} + \beta_3 * \text{leave} + \beta_4 * \text{unemp} + \beta_5 * \text{teen} + \beta_6 * \text{fpl} + \beta_7 * \text{wait} + \gamma$$

In these models, Y is the outcome rate, exp is the variable indicating whether or not a state had a Medicaid expansion (0, 1, or a fraction for the states that expanded Medicaid in the middle of a year), leave is a binary variable determining whether or not a state has a paid family leave policy, unemp is the unemployment proportion in the state, teen is the teen pregnancy rate in the state, fpl is the percentage of families with children under the age of 5 living below the federal poverty level, and γ represents the random state effect.

To confirm model robustness, a sensitivity analysis was conducted with policy, state, and year entered as fixed predictors of abuse. In this model, we didn't account for within state correlation over time. As with the primary model, this approach did not require explicitly defining a pre or post based on a fixed calendar year.

We also performed descriptive analyses as well as running generalized linear mixed models for the parental Medicaid coverage proportion as well as the change in Medicaid eligibility as determined by the change in % FPL with Medicaid expansion status as the exposure of interest. Additionally, we looked at the association between the proportion of parents covered by Medicaid and rates of abuse and neglect reports as well as that between the change in Medicaid eligibility and those same maltreatment outcomes.

All analyses were conducted using SAS 9.4 (SAS Institute, Cary, NC).

Results

We analyzed NCANDS data for 31 states and the District of Columbia that expanded Medicaid and 19 states that did not during the period between 2010 and the end of 2016. As shown in Table 1, states without Medicaid expansion had a slightly larger child population on average in both 2013 and in 2016 than the states that did expand. Both groups of states saw a reduction in both the mean unemployment rate as well as the mean teen birth rate between 2013 and 2016 though the teen birth rate was notably higher in states that did not expand Medicaid in both 2013 and 2016. The average proportion of families with children under the age of 5 living below the federal poverty level dropped from 2013 to 2016 in states with and without Medicaid expansion, though the average proportion was higher both in 2013 and in 2016 in states that did not expand Medicaid. The proportion of adults with dependent children with Medicaid coverage increased in both groups from 2013 to 2016, with almost 19% of that adult population having Medicaid coverage in 2016 in states that expanded Medicaid compared to 13.3% in the states that did not.

	States that expanded Medicaid		States that did not ¹	
Number of states & DC	31		20	
	2013	2016	2013	2016
No of children <18 years	857,254 (270,897; 1,613,675)	868,727 (260,588; 1,631,492)	1,093,095 (594,536; 1,678,977)	1,097,222 (594,138; 1,685,959)
<6 years	279,291 (79,339; 535,097)	283,014 (77,858; 546,367)	354,489 (198,220; 550,928)	352,356 (193,049; 550,816)
<12 months	45,280 (12,706; 87,438)	46,900 (12,644; 91,223)	56,860 (31,973; 90,973)	58,257 (31,975; 91,232)
Unemployment rate	7.3 (6.6, 8.1)	4.9 (3.9, 5.4)	6.7 (5.3, 7.4)	4.7 (4.0, 5.2)
Teen birth rate	23.6 (17.7, 30.3)	17.8 (13.2, 23.7)	29.6 (24.8, 34.5)	23.5 (19.2, 28.2)
% below federal poverty	16.8 (13.5, 21.2)	15.5 (11.9, 19.1)	20.7 (18.3, 23.6)	18.7 (16.5, 22.1)
Reports of physical abuse or neglect per 100 children < 6 years	5.68	5.75	4.91	4.24
% parents on Medicaid	14.6 (12.3, 19.5)	18.9 (14.6, 23.3)	9.2 (8.0, 13.8)	13.3 (10.5, 15.6)

¹Louisiana began expansion in July of 2016, and is included among the states that did not expand Medicaid for descriptive purposes in this table.

Table 1: Comparison of the states that expanded Medicaid to those that did not. Unless otherwise noted, values represent the median with the interquartile range in parentheses.

As seen in Table 2, Medicaid coverage for adults with dependent children saw an absolute increase after 2014 of 2.3% in the states that did not expand Medicaid and of 3.7% in the states that did. The states that did not expand Medicaid saw a decrease in the Medicaid eligibility cutoff for parents of 11 percentage points of the FPL whereas the states that did expand saw the eligibility cutoff increase by 36.9 percentage points of the FPL.

		Net change in Medicaid coverage rate	Net change in Medicaid eligibility (%FPL)	Net change in combined abuse and neglect report rate (per 100,000 children)	Net change in physical abuse report rate (per 100,000 children)	Net change in neglect report rate (per 100,000 children)	
No Medicaid Expansion	N	20	20	20	20	20	
	Mean	2.3	-11	-132.5	4.8	-130.8	
	SD	2.8	23.6	305.8	307	322.2	
	SE	0.6	5.3	68.4	68.7	72	
	Median	1.9	-6	-158	-38.5	-106.9	
	IQR		0.4	-17	-380.4	-78.9	-317.5
			4.3	2.5	-16	10.3	-19.1
Medicaid Expansion	N	31	31	31	31	31	
	Mean	3.7	36.9	-197.6	23.3	-222	
	SD	4.8	53.8	467.5	431.6	370.2	
	SE	0.9	9.7	84	77.5	66.5	
	Median	4.2	42	-239.9	-63.2	-220.6	
	IQR		0.9	5	-460.1	-103.1	-431.7
			6	81	-7.6	-5.7	25.8

Table 2: Net change after expansion of Medicaid coverage rate and eligibility criteria for adults with dependent children and abuse and neglect report rates comparing the states that expanded Medicaid to the ones that did not expand.

The Medicaid coverage proportion for adults with one or more dependent children was found to increase annually ($p=0.01$) and was positively associated with Medicaid expansion status ($p=0.04$). As would be expected in comparing the years 2013 and 2016, Medicaid expansion was found to be associated with a significant increase in %FPL Medicaid eligibility ($p<0.01$).

The average neglect report rate decreased after expansion took place in both the states that expanded and those that did not, by 222 reports and 130.8 reports per 100,000 children under the age of 6 years respectively (Table 2). Table 3 shows the estimates for net change in abuse and neglect rate after Medicaid expansion in the states that expanded Medicaid relative to the states that did not expand Medicaid. While there was not a statistically significant association with Medicaid expansion and the combined rate of physical abuse and neglect, or the rate of physical abuse alone, having a Medicaid expansion policy was associated with having on average 120 fewer reported neglect cases per 100,000 children (-120.1 per 100,000, p=0.02). The results obtained when run as fixed effect models were very similar.

	Difference in net change in abuse or neglect rate after Medicaid expansion – unadjusted model (95% CI)	Difference in net change in abuse or neglect rate after Medicaid expansion – adjusted model (95% CI)
Physical abuse or neglect reports per 100,000 children	-73.7 (-188.4, 41.0)	-69.5 (-184.9, 45.8)
Physical Abuse reports per 100,000 children	50.8 (-28.4, 129.9)	59.3 (-20.0, 138.6)
Neglect reports per 100,000 children	-118.8* (-222.3, -15.4)	-120.1* (-225.1, -12.1)

Table 3: Changes in child abuse and neglect rates per 100,000 children in states that expanded Medicaid relative to states that did not expand Medicaid. The adjusted model controlled for the following covariables: paid family leave, unemployment, teen birth rate, proportion of families living in poverty, and presence of a child care wait list.

*p-value < 0.05

CI = confidence interval

If there were an association between the change in Medicaid eligibility or rate and rates of physical abuse or neglect, when displaying state-level physical abuse or neglect rates as a function of the change in Medicaid eligibility or rate of coverage, we would expect to see the data arranged in an elliptical fashion. For example, a state that saw an increase in both its Medicaid coverage proportion for parents and in its incidence rate of screened-in neglect referrals would show in the upper right quadrant of the graph in figure 5a. Figures 4a and 4b demonstrate that there is not an association between either the change in Medicaid coverage proportion for parents or the change in Medicaid eligibility and rates of physical abuse reports, though there are outliers. Figures 5a and 5b, however, suggest that there may be an association between both the change in Medicaid coverage proportion for parents as well as the change in Medicaid eligibility and the rates of neglect reports. This appears especially pronounced in the states that expanded Medicaid.

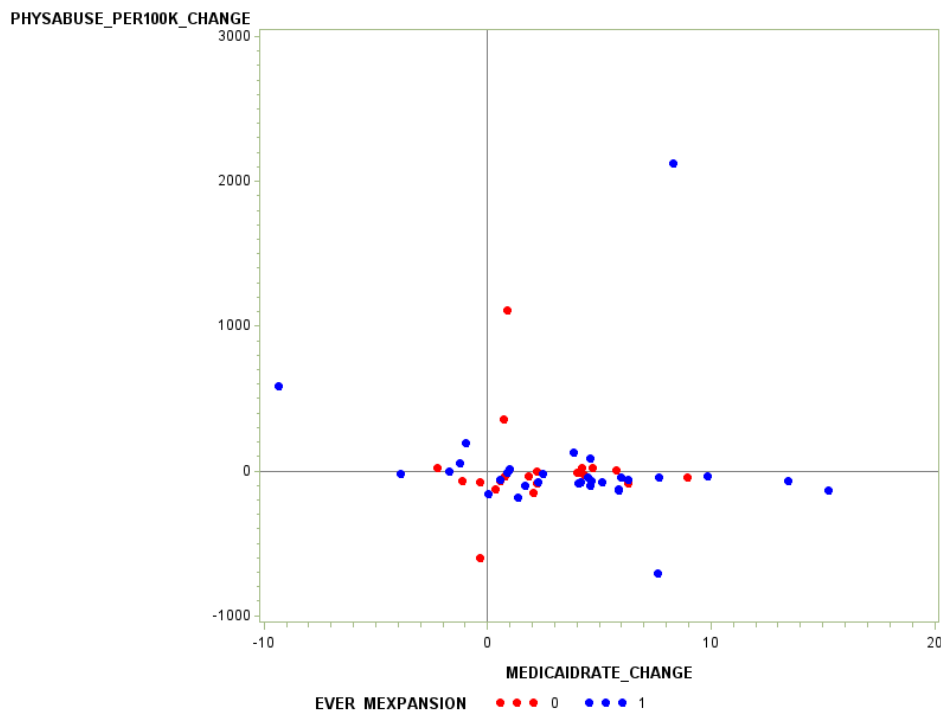


Figure 4a: Bivariate plot of the association of change in Medicaid coverage proportion (x-axis) with physical abuse reports (y-axis). Red dots represent the states that did not expand Medicaid and the blue dots represent those that did expand.

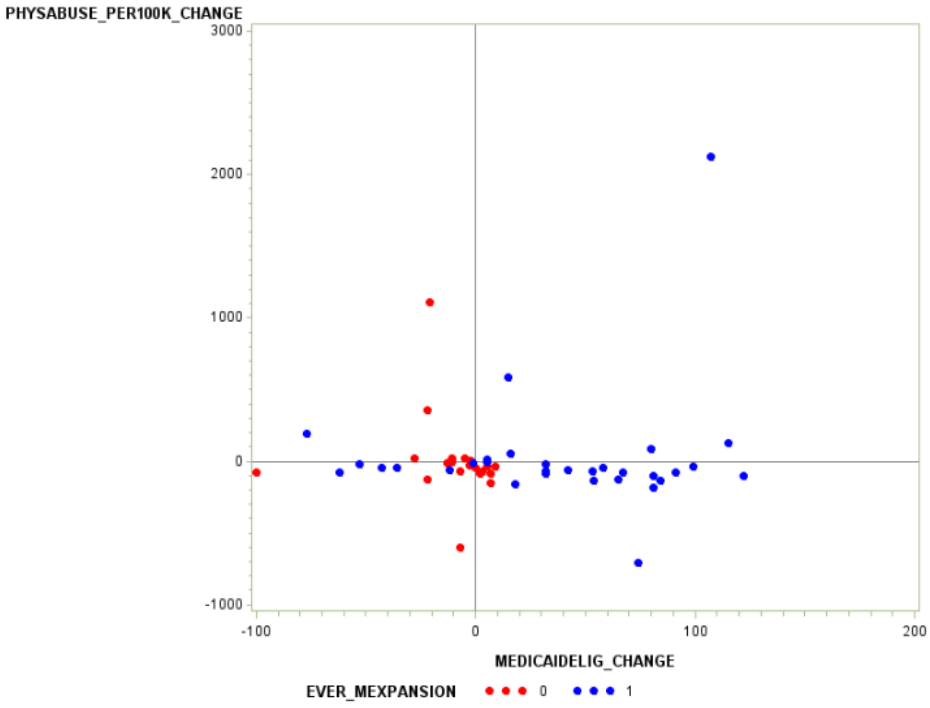


Figure 4b: Bivariate plot of the association of change in Medicaid eligibility (x-axis) with physical abuse reports (y-axis). Red dots represent the states that did not expand Medicaid and the blue dots represent those that did expand.

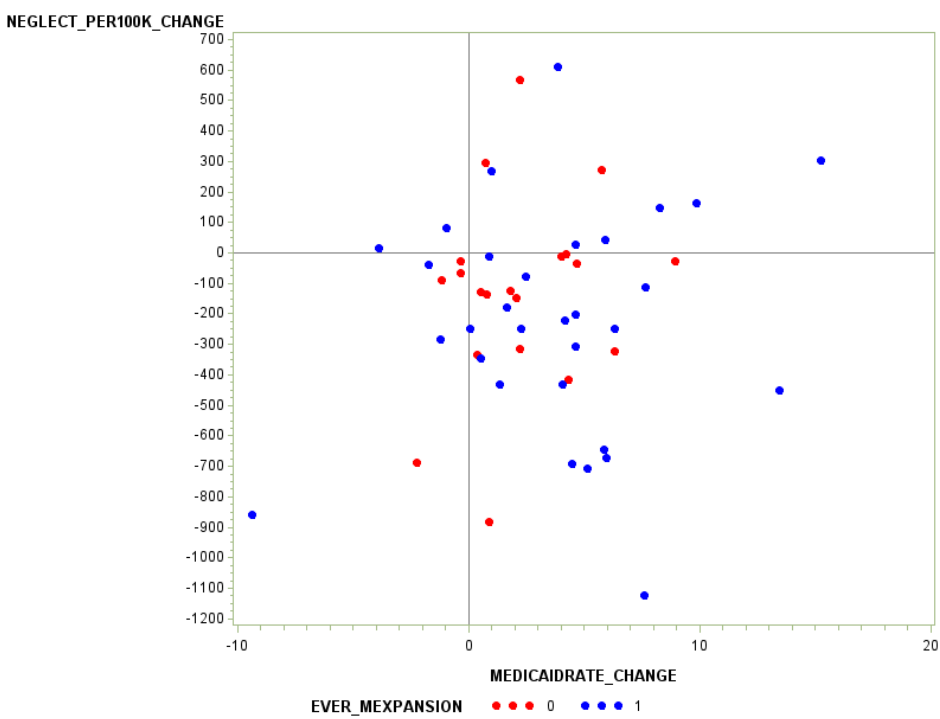


Figure 5a: Bivariate plot of the association of change in Medicaid coverage proportion (x-axis) with neglect reports (y-axis). Red dots represent the states that did not expand Medicaid and the blue dots represent those that did expand.

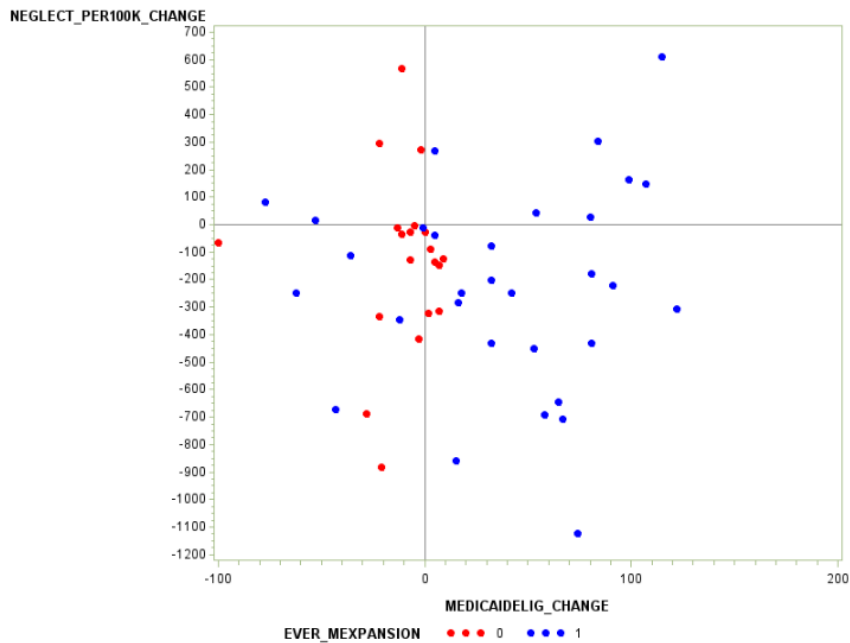


Figure 5b: Bivariate plot of the association of change in Medicaid eligibility (x-axis) with neglect reports (y-axis). Red dots represent the states that did not expand Medicaid and the blue dots represent those that did expand.

Discussion

This study suggests that there was an association between the ACA Medicaid expansion and reductions in the rate of reports made to CPS for concerns of neglect in children under the age of 6 years. This association was seen even after controlling for several other factors including state-level policies and measures that might have an impact on the reporting rate of child neglect and be associated with the status of Medicaid expansion in a state.

The results add to the small but growing group of studies demonstrating a positive association between a social policy and one or several child maltreatment outcomes.^{15,16} While the study could not assess whether this association was causal, the positive association with reduced neglect is encouraging. Neglect represents about three quarters of reported child maltreatment

cases in the United States.³⁷ In spite of being the most common form of child maltreatment, efforts to prevent neglect have proven difficult in part due to a lack of consensus regarding what constitutes neglect and how to best stratify risk for neglect.^{37,38} Our findings in this study could therefore offer a promising avenue for future child neglect prevention research.

The absence of an observed association here between Medicaid expansion and rates of reported physical abuse could be due to one of several possibilities. The first is that there may truly not be any association between Medicaid expansions and child physical abuse suggesting that at least some of the pathways resulting in physical abuse are different from those resulting in neglect. It is also possible that there is an association between Medicaid expansion and physical abuse, but that there is a different time factor when compared to neglect. This could suggest that the association is delayed relative to that seen with neglect and was therefore not captured in the relatively short time period of study. And finally, it is also possible that there is an association between Medicaid expansion and physical abuse in the general population, just not in the subset of cases that are reported to CPS.

Additionally, we found that expanding Medicaid was associated with both an overall increase in the % FPL eligibility cutoff as well as an actual increase in the proportion of parents covered by Medicaid. This particular finding is in line with prior research demonstrating that the expansion of Medicaid had the intended effect of increasing Medicaid coverage.^{22,25,39} If the relationship between the Medicaid expansion and reduced child neglect is a causal one, these findings also serve to reinforce the proposed causal pathway through which this might occur; namely that expanding Medicaid results in increased Medicaid coverage for parents which then results in reduced risk of neglect for their children.

This study has several limitations. Considering the Medicaid expansion as a quasi-binary exposure as we did in our main model may have masked some of the more complex changes that occurred in each state. In looking at Medicaid eligibility for parents based on income, there was considerable heterogeneity between states even before the ACA Medicaid expansion took place, and then after state expansion occurred, some states saw much larger changes in eligibility and coverage than others. We explored this issue by doing further analyses and looking not only at the association between Medicaid expansion and the child maltreatment outcomes, but also looking at the associations between Medicaid expansion and these intermediate outcomes.

It is also important to note that Medicaid coverage increased even in states that did not expand Medicaid. Other studies have attributed this finding to a “welcome-mat” effect among people who had been eligible for Medicaid before the expansions took place, but only applied for Medicaid coverage after learning more about health care coverage through the national health care discussions.³⁹ In spite of this issue, however, we did still demonstrate that the increase in Medicaid coverage for parents was significantly larger in the states that expanded Medicaid than in the states that did not.

There may have been unmeasured confounders associated with whether a state opted to expand Medicaid and with its child maltreatment rates. Failing to include these in the analyses may impacted the results, though because in difference-in-difference analyses states are compared to themselves, we do not think it likely that these would have significantly impacted the results.

And finally, it has been demonstrated previously that only a subset of children who are maltreated are reported to CPS and are therefore included in the NCANDS database that was

used for this study.^{40,41} It is possible that including the entire population of maltreated children might alter the results, either by strengthening or weakening the association seen here.

Conclusion

Though this study could not evaluate whether a causal relationship exists between the Medicaid expansion of 2014 and the statistically significant decrease in the rate of reported cases of neglect in states that expanded Medicaid, the results do show that there is an association between the Medicaid expansion and the decrease in the reported neglect rate. Future studies should focus on evaluating the possible causality of this relationship as well as assessing what the mechanism for this association is, including whether the improvement of a parent's financial status, the improvement of a parent's physical and mental health, both, or another factor explain the difference seen between having and not having expanded Medicaid.

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