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A Cascade of Care: Analyzing Spillover Effects of Medicaid Expansion on Child Emergency Department Utilization

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ABSTRACT

Following the enactment of President Obama's Affordable Care Act, several states raised their Medicaid eligibility income thresholds, leading to a substantial rise in Medicaid enrollment among low-income adults. Extensive research has investigated the effect of Medicaid expansion on adult healthcare behavior and emergency department (ED) use, but few studies have examined its spillover effects on child ED visits. In this paper, I specifically analyze the effect of Medicaid expansion and parental enrollment on child ED visit frequency and payer composition. Through a difference-in-differences analysis, I find a significant increase in child ED visits in expansion states post-implementation, alongside a rise in the Medicaid payer share for these visits. I suggest that Medicaid expansion may alleviate barriers to ED access but may also contribute to moral hazard and an increase in healthcare-seeking behavior. Policies aimed at increasing primary and preventative care use could improve child health outcomes and reduce unnecessary ED visits.

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INTRODUCTION

President Barack Obama's Affordable Care Act was a pivotal turning point in increasing healthcare access for Americans. Enacted on March 23, 2010, this act was considered "a watershed in U.S. public health policy" (Rosenbaum, 2011, p.130). Composed of several measures aimed at achieving near-universal health insurance coverage while bolstering its quality and affordability, the Act garnered both praise and resistance. A fiercely debated component of this legislation was the expansion of Medicaid, whereby nearly all low-income adults with income up to 138% of the Federal Poverty Level (FPL) gained Medicaid eligibility. However, while certain states embraced this expansion, others opted to maintain their existing, lower income thresholds. This divergence has wielded profound effects on healthcare, manifesting in noticeable divergences in outcomes between expansion and non-expansion states. Notably, Medicaid expansion correlates with increased access to care and improved health outcomes (Sommers et al., 2017).

Of particular interest is the effect of Medicaid expansion on adult emergency department (ED) visits. Extensive research has been conducted, analyzing whether Medicaid expansion results in a reduction in ED visits due to improved healthcare behaviors and increased rates of preventative care, or if it instead induces greater moral hazard – the overutilization of health services due to decreased financial burden. Despite this scrutiny, findings on ED visit patterns between expansion and non-expansion states have yielded mixed conclusions. Health policy experts have yet to arrive at a definitive consensus on the effect of Medicaid expansion on adult ED use. While some speculate that moral hazard may indeed play a role in influencing the frequency of ED visits, others emphasize the importance of considering factors such as the

medical urgency and subsequent diagnosis of the ED patient, as well as the demographics of the studied population.

However, because Medicaid expansion primarily enhances the Medicaid insurance eligibility of low-income adults, little attention has been paid to the policy's impact on child ED visits. Evidence suggests a positive correlation between parental health insurance coverage and the well-being of children within the same household. Notably, children are more likely to be enrolled in health insurance when their parents are insured, leading to improved health outcomes and increased access to primary care (Schubel, 2021). Conversely, this subsequent increase in child health insurance enrollment could increase healthcare-seeking preferences and facilitate greater utilization of ED services, as previously established above. However, few studies have explored whether these spillover effects extend to pediatric ED use, although patients aged 1-17 accounted for nearly 20% of all ED visits in 2014 (Moore, 2017). ED spending has continued to grow, and more research is needed to determine the factors driving this increase (Scott et al., 20121, p.4). While children are not the primary beneficiaries of the Medicaid expansion policy, their healthcare behaviors may still have been influenced by its implementation. Analyzing these potential spillover effects is crucial for understanding the broader welfare impacts of Medicaid expansion.

This paper aims to investigate this particular effect. Specifically, I will examine whether Medicaid expansion for adults leads to increased pediatric ED utilization. Additionally, drawing from prior research establishing a correlation between increased adult Medicaid coverage and subsequent health insurance enrollment for children in the same household, I will examine whether the payer composition of ED visits correspondingly changes after policy

implementation. Ultimately, this analysis will contribute to illuminating the factors driving ED use, including the relationship between insurance and healthcare utilization.

To address this question, I conducted a difference-in-differences regression analysis, comparing the frequency of ED visits between expansion and non-expansion states for individuals aged 0 to 18. This method allows for a comprehensive examination of the impact of Medicaid expansion on pediatric ED utilization. Moreover, a further difference-in-differences regression analysis is conducted to discern whether there are variations in the insurance type of these ED attendees post-expansion. This analysis provides insight into potential shifts in healthcare-seeking behavior in family households following policy implementation, possibly elucidating the role of insurance coverage in determining emergency care use. Results from these analyses indicate that pediatric visits do increase by 3.6 visits per 1000 children per quarter, on average, in expansion states compared to non-expansion states following implementation of Medicaid expansion. A relative increase in the Medicaid share, although not significant, also indicates a possible shift in healthcare utilization. Finally, after adjusting for the post-implementation change in Medicaid enrollees at the state level, I also found a direct correlation between adult Medicaid enrollment and both the frequency and payer type of pediatric ED visits. These findings build upon previous literature to inform future policy choices regarding moral hazard and the spillover effects of adult insurance on subsequent child health behaviors and outcomes.

BACKGROUND

The ACA and Medicaid Expansion

Although Medicare and Medicaid were enacted simultaneously in 1965 under Title XIX of the Social Security Act, Medicare initially garnered attention as the more landmark provision. In a landscape with limited public health insurance coverage, Medicare was hailed as a significant milestone and a transitional step towards achieving comprehensive national health insurance for all Americans by its liberal proponents. The assassination of President Kennedy and the subsequent election of his vice president, Lyndon B. Johnson, further bolstered congressional support for the program. When the legislation finally passed, Medicare was positioned as the central component, with Medicaid conceived “as a firewall around Medicare, alleviating subsequent pressure for costly coverage expansions" (Rose, 2013, p.2).

Modeled after already existing state welfare programs, Medicaid was designed to have limited growth potential. It operated through joint funding from federal and state governments, primarily focusing on increasing healthcare access for public welfare recipients. However, it has since expanded to encompass a broader demographic, including low-income families, pregnant women, people with disabilities, and those requiring long-term care (“History,” n.d.). Through enormous growth over the last several decades, Medicaid has surpassed Medicare as the nation’s largest health insurance program. At the time of writing, 77,913,798 individuals were enrolled in Medicaid (“December 2023 Medicaid Enrollment,” n.d.).

In 2010, President Obama further expanded Medicaid through the enactment of the Patient Protection and Affordable Care Act (ACA), a historic advancement in increasing healthcare access. The ACA introduced several key components, including state insurance

exchanges, stricter regulations on insurance companies, insurance subsidies for low-income individuals, and crucially, the expansion of Medicaid (Quadagno, 2014). This latter provision mandated that all states participating in Medicaid expand coverage to individuals under the age of 65 earning up to 138% of the FPL. By removing the stipulation that individuals must fall under certain groups to qualify for Medicaid, this provision greatly increased accessibility. During the initial phase of expansion, funding was to be fully provided by the federal government.

Prior to the ACA, Medicaid eligibility thresholds varied widely among states and for different groups. Of note, eligibility for parents ranged widely: in 2013, Arkansas's Medicaid income limit was curbed at just 16% of the FPL, while Montana allowed parental enrollment up to 215% of the FPL. Moreover, with the exception of Minnesota, non-parents, who did not already fall into existing categories, were generally ineligible for Medicaid in most states (Glied & Weiss, 2023).

However, the passage of the ACA sparked an immediate backlash, with 26 states swiftly filing federal lawsuits. Opinion was generally split along partisan lines. Contention revolved around the federal government's authority to condition grants on Medicaid expansion enrollment, as the ACA stipulated that states refusing to expand would risk losing all of their existing Medicaid funding (Jones, 2013). A consequential 7-2 ruling by the Supreme Court aligned with these concerns, with the Court asserting that the Medicaid expansion provision amounted to undue coercion on the states. The Court subsequently precluded the federal government from terminating already-established funding to states choosing not to opt in (Perkins, 2013). Additionally, the ruling deemed the expansion optional, allowing each state to decide whether or not to enroll. States that opted out faced no immediate threat to their current federal funding. For

those states that did choose to expand Medicaid, program implementation officially began in 2014, with an initial 26 states and the District of Columbia opting to enroll at the start of this year.

With an additional 15 other states following suit and implementing Medicaid expansion at various later dates, currently 40 states and the District of Columbia are participants in the policy. 10 states have yet to enroll, reflecting the still highly contentious and politicized conversation around the ACA. Since its passage, opponents have made continuous efforts to repeal or overhaul the legislation, citing unsustainable costs and limited provider choices. It remains one of the most controversial healthcare laws in U.S. history.

However, since the enactment of the ACA, Medicaid enrollment has increased substantially. In 2015, after the first full year of implementation, national Medicaid enrollment experienced an increase of 13.8 percent, compared to 9.6 percent in the preceding year. This surge in enrollment was notably greater in expansion states, witnessing an enrollment rate three times greater than that of non-expansion states (Rudowitz et al., 2015). And between 2013 and 2020, Medicaid enrollment in expansion states increased by 13 million individuals, marking a staggering 33.9 percent increase. Much of this surge can be attributed to adults becoming eligible for Medicaid due to the expansion, although a rise in enrollment among individuals previously eligible before the enactment of the ACA has also been observed (“Medicaid Enrollment Changes Following the ACA,” 2022). Notably, although children have not been directly affected by Medicaid expansion, child enrollment has also seen a notable uptick. An analysis of the 2013-2015 American Community Survey found that more than 700,000 low-income children gained health insurance coverage due to spillover effects from Medicaid expansion (Hudson & Moriya, 2017, p.1643).

Although Medicaid enrollment was greater in expansion states, the enactment of Medicaid expansion still positively affected the enrollment rates in non-expansion states, primarily attributed to increased outreach efforts. Between 2013 and 2020, enrollment increased by nearly one million individuals in these states ("Medicaid Enrollment Changes Following the ACA," 2022). It is important to emphasize that because Medicaid expansion was not implemented in these states, these post-policy enrollments can only be attributed to previously eligible individuals.

However, in these 10 non-expansion states, there remains a disproportionate number of uninsured individuals. Approximately 1.9 million of them fall into what is commonly referred to as the Medicaid gap: their incomes exceed state Medicaid eligibility thresholds but fall below cutoffs for ACA Marketplace subsidies (Drake et al., 2024). These individuals would have been eligible for Medicaid had they lived in a state that chose to expand the program following ACA passage. However, in non-expansion states, the median income eligibility limit for parents stands at just 38% of the FPL (Drake et al., 2024). Consequently, many individuals in these states who do not qualify for Medicaid or subsidies are left without insurance coverage, often resulting in lower access to care. In 2022, non-expansion states exhibited more than twice the uninsured rate compared to states that opted to expand Medicaid (Terlizzi & Cohen, 2023). Adults in this Medicaid gap, caught between Medicaid and subsidy eligibility, are disproportionately people of color, and many have significant health needs requiring comprehensive care (Drake et al., 2024).

To conduct this study, I must also underscore that Medicaid expansion only impacts the eligibility of adults, both by raising the eligibility threshold and broadening the criteria for enrollment to include most adults. This analysis can thus isolate the effect of parental enrollment on child health outcomes.

In contrast to adult eligibility, low-income children experienced very few changes to their healthcare insurance eligibility following ACA implementation. Health insurance for low-income children has historically been provided by both Medicaid and the Children's Health Insurance Program (CHIP). Prior to ACA, enrollment criteria varied widely across states. States participating in Medicaid were required to cover children aged five and younger up to 133% of the FPL and older children up to 100% of the FPL (Rudowitz et al., 2014). CHIP, as part of the Balanced Budget Act of 1997, was established to supplement Medicaid by offering coverage for low-income children above these thresholds and providing greater federal funding ("History and Impact of CHIP," 2018). With the implementation of the ACA, the minimum Medicaid eligibility level was standardized to 138% of the FPL for all children up to age 19. However, this change did not directly alter enrollment; instead, it simply required states to transition children from CHIP to their respective Medicaid program to satisfy ACA requirements. Twenty-one states had previously covered these "stairstep children" through CHIP, and thus restructured their state Medicaid programs to incorporate these children instead.

However, despite the availability of Medicaid coverage for eligible children, many remain unenrolled. This issue has been largely attributed to the lack of parental knowledge regarding eligibility thresholds (Rudowitz et al., 2014). In 2014, it was estimated that out of the roughly 14 million individuals who were eligible for Medicaid but not enrolled, 37% were children. In states that have opted not to enroll in Medicaid, this percentage rises to 75% (Rudowitz et al., 2014).

Thus, although the ACA did relatively little to change child public insurance eligibility and because the enactment of Medicaid expansion only directly targets low-income adults, this

policy can be viewed as an effective intervention to measure the effect that Medicaid expansion of adults had on the healthcare behaviors of children.

Emergency Department Use

The emergency department stands as the foundation of a community's healthcare infrastructure, providing vital care 24/7 to individuals in life-threatening situations. Often, it serves as the initial point of contact for patients seeking immediate medical attention. However, despite its critical role, a significant portion of the population continues to use the emergency department for a myriad of healthcare needs, including non-urgent care. In 2017, approximately 2 million adults in the US reported the ED as their primary source of preventative healthcare (Primm et al., 2019). For those encountering significant barriers to accessible medical care, the ED becomes a vital safety net, offering a reliable method of receiving care when other providers are unavailable or too expensive. Federal law mandates that emergency departments provide care to all individuals, regardless of financial ability or insurance status. Consequently, underserved populations – typically lower-income individuals, those with less education, the uninsured, and people of color – often rely on the ED in place of primary and preventative care services for their medical needs (Udalova et al., 2022).

Health insurance plays a pivotal role in an individual's access to preventative health services, and consequently, their frequency of visits to the emergency department. However, conflicting research has emerged regarding the impact of health insurance on ED usage. Because insurance can alleviate financial barriers to both preventative services and the ED, its effects on ED usage can exhibit contradictory trends. On one hand, health insurance reduces financial

obstacles to preventative care, therefore potentially decreasing the need for emergency services further down the line (Basu & Phillips, 2016). Conversely, gaining insurance coverage may encourage individuals to use the ED more frequently, as Medicaid covers ER services (to varying degrees) in every state. Studies have demonstrated that insurance may even increase the utilization of both primary care and emergency care concurrently (Horwitz et al., 2005).

LITERATURE REVIEW

The frequency and composition of adult ED visits following the enactment of the ACA and Medicaid expansion have been extensively studied. However, the current literature presents a complex and ambiguous landscape, with conflicting explanations for the observed changes in ED usage post-policy implementation. Moreover, variations in adult ED visits appear to be largely dependent on the demographics of the population and the urgency of the visits.

One perspective argues that Medicaid expansion is associated with a decrease in adult emergency department use. Studies corroborating this correlation generally find these decreases in ED visits for preventable and primary-care treatable conditions, suggesting that improved access to primary care services may serve as a viable alternative to emergency room visits. A study comparing two expansion states (Massachusetts and New York) with two non-expansion states (Florida and Georgia) found that ED visits decreased by an average of 4.7 visits per 1000 people following 2014 for less urgent diagnoses (Giannouchos et al, 2022). Even before the enactment of the ACA, states with more generous pre-expansion Medicaid income eligibility also exhibited lower rates of non-urgent ED use, thus suggesting that expanded healthcare coverage is a prominent driver of this relationship (Mandal et al., 2019). Evidence from

Massachusetts' 2006 reform, designed to provide near-universal health insurance coverage for nearly all residents, also indicates a reduction in ED admissions for preventable conditions compared to other states (Kowalski, 2023).

Conversely, another body of literature has indicated the opposite trend: adult ED visits have increased in expansion states following the implementation of Medicaid expansion. In one study, ED use increased by an additional 2.5 visits per 1000 people in Medicaid expansion states following 2014 (Nikpay et al., 2017). This uptick in ED visits was found to be correlated with a state's Medicaid enrollment following the expansion; states that experienced the most significant increases in Medicaid enrollment also saw a greater rise in ED visits. Moreover, there was a noticeable shift in the payer composition of these ED visits, with the share of ED visits covered by Medicaid increasing substantially compared to the shares covered by private insurers or paid for by the uninsured (Nikpay et al., 2017; Zhao & Nianogo, 2022). This payer shift alludes to moral hazard and a causal relationship between Medicaid expansion and ED visits, with more individuals covered by Medicaid visiting the emergency room relative to others.

Next, I will discuss the relationship between parental insurance, child enrollment, and subsequent child health outcomes. Research has already established a consensus regarding the positive effect that expanding health insurance for parents has on the health coverage and outcomes for children within the same household. For example, Oregon's 2008 randomized Medicaid expansion revealed that children had 18% higher odds of being covered in the first six months after their parent's enrollment in Medicaid (DeVoe et al., 2015). Often referred to as the "welcome mat" or "woodwork" effect, this phenomenon demonstrates that children are more likely to be covered when their parents are enrolled. Another study found that children enrolled disproportionately into Medicaid after their parents became newly eligible (Hudson & Moriya,

2017). Even if adults are targeted for insurance enrollment, the effects are broadened to the entire family unit.

Much of the welcome mat effect is attributed to the extensive publicity surrounding the enactment of the ACA and the subsequent outreach efforts aimed at promoting the newly raised eligibility thresholds, as discussed by Hudson and Moriya (2017). These outreach efforts serve a dual purpose: they help diminish the stigma associated with public coverage, while also educating parents who may have been previously unaware of their children's eligibility for coverage. Furthermore, the ACA introduced provisions that streamlined both the application process and eligibility determinations, further alleviating barriers to enrollment. Specifically, the ACA mandated the use of the Modified Adopted Gross Income (MAGI), which serves as a uniform income standard to determine eligibility across states. Additionally, some states implemented processes to determine an applicant's eligibility for various insurance pathways – including Medicaid, CHIP, and ACA marketplace subsidies – regardless of the initial program for which the applicant applied, further facilitating enrollment. In the initial year following the ACA, parents made up a quarter of all adults gaining insurance coverage, and Medicaid rates for low-income parents in expansion states specifically increased by around 12 percent (Hudson & Moriya, 2017).

Besides stimulating child enrollment, parental access to medical care positively impacts the health and well-being of the entire family, facilitating access to services through various mechanisms. Firstly, a child's health is intrinsically linked to that of their parents, as the parent-child relationship significantly influences child development. For example, maternal depression, which disproportionately affects low-income individuals, has been found to increase children's risk of developing social disorders and learning disabilities (Chester et al., 2016).

Medicaid expansion enhances parental access to resources addressing maternal depression, including screenings and treatments – therefore alleviating strain on the parent and benefitting the parent-child relationship. The self-reported health status of parents in expansion states also improved relative to non-expansion states (Gopalan et al., 2022). Finally, parental coverage gain is correlated with increased access to care for children; a study found that children were nearly 30% more likely to receive annual checkups if their parents were enrolled in Medicaid (Schubel, 2021). This increased access to primary care has subsequently been linked to decreased pediatric emergency department utilization (Piehl et al., 2000).

Secondly, a child's enrollment in Medicaid plays a critical role in their health and development. For previously uninsured children, Medicaid offers comprehensive benefits, including preventative care, screenings, medical equipment, and specialized services for children with disabilities. These services ultimately improve health outcomes in adulthood, in addition to greater financial security and improved academic achievement (Schubel, 2021).

While the current literature on pediatric emergency department use following ACA implementation is limited, preliminary findings indicate an increase in utilization. Using data from the Nationwide Emergency Department Sample (NEDS), Lee and Monuteaux found that national ED rates rose by 9.8 percent in the two years following implementation (2019). However, in my review of the current literature, I found no study that specifically analyzed pediatric ED rates on a state-level basis to isolate the effect of Medication expansion and adult enrollment. Thus far, studies have predominantly examined ED utilization at a national or regional level, therefore presenting the opportunity for this paper to contribute more specific results following policy implementation. By investigating at a state level, this paper will offer insight into the direct impact of Medicaid expansion on pediatric ED visits within individual

states, as well as between states either forgoing or enrolling into Medicaid expansion. This approach will allow for a more comprehensive understanding of how Medicaid expansion influences pediatric healthcare behaviors.

Past studies analyzing adult enrollment appear to generally emphasize the significant role moral hazard plays in influencing adult ED visits post-implementation. However, they have also highlighted the significant role of population characteristics in shaping trends. Given that children represent a markedly different demographic, it remains to be seen whether child ED visits adhere to these same patterns.

DATA AND METHODS

Data Selection and Cleaning

Data was collected from the Healthcare Cost and Utilization Project (HCUP) Fast Stats Dataset. Administered by the Agency for Healthcare Research and Quality under the U.S. Department of Health and Human Services, HCUP is the largest dataset of longitudinal hospital care data within the United States. For this difference-in-differences analysis, data was drawn from the HCUP Emergency Department Visits dataset. Within this dataset, emergency department visits for pediatric patients (aged 0-18) are categorized by state, fiscal quarter, and payer type. Payer type is coded as either Medicaid, Private insurance, or Self-Pay/No Charge. In this paper, Self-Pay/No Charge will be referred to as Uninsured.

Following the passing of the ACA and the subsequent Supreme Court ruling, there was no mandate requiring that states enroll in Medicaid expansion by a specific date. Consequently, a wide time frame exists in which states could begin implementation. Of the states that have opted

in, a majority began implementation of Medicaid expansion at the earliest possible date: January 1st, 2014. However, since then, states have gradually opted into Medicaid expansion. North Carolina is the most recent state to expand Medicaid, beginning on December 1st, 2023 ("Status of State Medicaid Expansion Decisions," 2024). However, to ensure continuity and minimize the effect of confounding and time-varying factors, I have chosen to incorporate a single treatment date for the difference-in-differences analysis. Given that many states initiated Medicaid expansion on January 1st, 2014, it emerged as the most appropriate date for this analysis. Of the 24 states beginning expansion on this date, 18 are available in HCUP. To maximize the number of states and data robustness – while also balancing the data available in HCUP – I established a pre-intervention period from 2012 Q1 to 2013 Q4 and a post-intervention period of 2014 Q1 to 2015 Q4. This resulted in a total of 15 expansion states included in my data set. Additionally, data was only available in this established period for 8 non-expansion states, leading to a total of 23 states being included in the analysis. More information about the included states and income threshold levels is outlined in Appendix A.

After extracting the raw data of ED visits per state, quarter, and payer type from HCUP, each observation was weighted according to its respective state's child population (age 0-18). Following this weighting, each state in the data set yielded the total number of pediatric visits per 1000 children, for each payer type and quarter. Population estimates were taken from the Kaiser Family Foundation's (KFF) annual child population estimates. As such, quarters within the same year were weighted using the same annual population estimate.

Additionally, to capture changes in payer type across expansion and non-expansion states over time, the payer shares of the total child ED visits were calculated. Visits under each payer type were converted to proportions relative to the total recorded visits. Combined, each state's

Medicaid, Private Insurance, and Self-Pay/No Charge proportion summed to 1. This calculation was performed for each state, payer share, and quarter.

Table 1: *Weighted summary statistics of the sample*

	Expansion States	**Non-Expansion States**
	(15)	(8)
Total Visits Recorded	38,671,650	22,629,100
Average Visits Per State	2,578,110	2,828,638
	Mean (SD)	**Mean (SD)**
ED Visits per 1000		
Before	88.63 (14.19)	93.75 (17.11)
After	88.76 (12.89)	90.20 (15.79)
Medicaid Share		
Before	0.548 (0.084)	0.636 (0.068)
After	0.580 (0.079)	0.652 (0.064)
Uninsured Share		
Before	0.067 (0.032)	0.079 (0.036)
After	0.058 (0.020)	0.066 (0.025)
Private Share		
Before	0.384 (0.090)	0.285 (0.083)
After	0.362 (0.083)	0.282 (0.078)

This regression analysis includes a total of 61,300,750 pediatric ED visits across 23 states between 2012 and 2015. Mean values for each of the outcomes are calculated using two separate time periods to represent the treatment effect. After weighting each state's visits by its annual population, expansion states are found to have a lower ED rate per 1000 children before implementation (88.63) compared to non-expansion (93.75). Notably, this ED rate slightly increased for expansion states after implementation, while conversely decreasing by about 3.5 visits per 1000 children for non-expansion states. The Medicaid payer share comprises the majority of child ED visits across both groups and time periods.

Empirical Strategy

Next, I will describe the methods used to conduct my difference-in-difference analysis.

Difference-In-Difference Model: A difference-in-difference model was determined to best capture the effect of Medicaid expansion implementation by comparing those states that chose to expand and those that did not over time. Given that randomization on the individual level is infeasible, a difference-in-difference model is a useful quasi-experimental approach that accounts for inherent differences between the treatment and control groups.

Outcomes of Interest: Two separate difference-in-difference analyses are performed in R to measure the effect of Medicaid expansion on a) the overall frequency of pediatric ED visits; and b)the payer type of these visits.

Covariates: The adjusted model also included time-varying covariates, including the proportion of White, Black, and Hispanic individuals; unemployment rate; and family income. Unemployment rate is defined as the seasonally-adjusted proportion of a state's civilian non-institutional population that is 16 years and older and unemployed. Family income is the collection of variables representing the proportion of families falling into the following ten income brackets: <$10,000; $10,000 to $14,999; $15,000 to $24,999; $25,000 to $34,999; $35,000 to $49,999; $50,000 to $74,999; $75,000 to $99,000; $100,000 to $149,000; $150,000 to $199,999; and >$200,000. These variables were commonly used in analyses studying the relationship between Medicaid expansion and ED use. All covariates were incorporated into the dataset at both the year-level and state-level from public-use sources including the Kaiser Family Foundation and the American Community Survey (ACS) from the US Census Bureau. These covariates were incorporated into the model to further isolate the effect between Medicaid expansion and pediatric ED visits by accounting for relevant state-level factors.

$$Y_{st} = \alpha_0 + \alpha_1 (Post) + \alpha_2 (Treatment) + \alpha_3 (Post * Treatment_{st}) + \varepsilon_{st}$$

Y represents the outcome variable of interest: either a) the total child ED visits per 1000 children in a state or b) the share of child ED visits covered by Medicaid, private insurance, or uninsured. α_0 represents the time-invariant variables (regression intercept). α_1 represents the change in child ED visits before and after implementation on January, 1st, 2014. *Post* is a binary variable representing time effect, set to 1 for visits occurring during or after the first quarter of 2014, and 0 otherwise. α_2 represents the change in child ED visits between states that implemented Medicaid expansion and those that did not. *Treatment* is a binary variable representing the effect of Medicaid expansion implementation, set to 1 for visits in expansion states and 0 otherwise. The interaction of these variables leads to α_3: the difference in child ED visits, either in frequency or payer share, between expansion and non-expansion states over time – also known as the difference-in-difference effect. ε represents the error term.

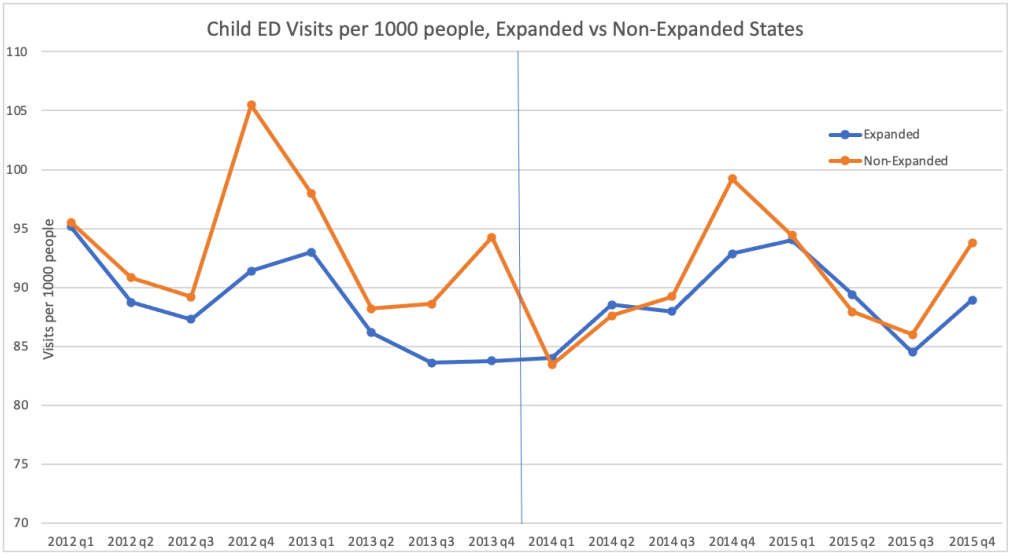
Assumptions

In performing this difference-in-difference analysis, several assumptions must be addressed.

1. **Independence of Treatment**: Treatment allocation is assumed to be independent of the outcome. In other words, a state's decision to opt into Medicaid expansion is not determined by the frequency of child ED visits or the payer composition.
2. **Parallel Trends**: In the absence of treatment (implementation of Medicaid expansion), the trends in the outcomes (frequency of ED visits or payer type) would have followed similar paths over time across expansion and non-expansion states. As this relies on an unobservable counterfactual, I instead performed a visual inspection of the outcomes of

interest between expansion and non-expansion states before 2014 Q1. As shown below in Figure 1, the two comparison groups do not exhibit strong parallel trends for frequency of visits. The vertical line separates the two time periods, as implementation began on January 1st, 2014. Considering that expansion states and non-expansions differ in demographic composition, there may be state-level characteristics that influence these trends and their variability. To account for this, several state-level controls (race, family income, and adult unemployment rate), as well as state and quarter-year fixed effects were added to the regression. Thus, although precautions are conducted to combat the variation, it must be acknowledged that the data used does not fully meet this assumption. The parallel trends assumption seems to visually hold for payer type, as outlined in Appendix B.

***Figure 1**: Child ED Visits per 1000 people per quarter*



3. **No Spillover Effects**: The treatment should only affect the treated units (expansion states). It must be acknowledged that implementation of Medicaid in expansion states still indirectly influences outcomes in the control group (non-expansion states), as there was an overall increase in Medicaid enrollment post-ACA in all states, although a difference-in-differences model should still capture the difference in child ED visits between expansion and non-expansion states over time.
4. **Stable Composition of Treated and Control Groups**: The composition of the two groups should remain stable over time. To account for changes in population, the rates of child ED visits per 1000 children per state and quarter were calculated using that respective year's child population. Additionally, time-varying factors, such as race, income, and unemployment rate, are controlled for.

The adjusted regression model holds a similar structure as the unadjusted model, but adds the following:

$$Y_{st} = \beta_0 + \beta_1 (Post * Treatment_{st}) + \upsilon_s + \delta_t + X_{st} + \varepsilon_{st}$$

In addition to the intercept and coefficient of interest, υ represents state-fixed effects, capturing the time-invariant characteristics specific to each state in the dataset. δ represents quarter-year fixed effects, capturing time-specific changes common to both the treatment (expansion states) and control (non-expansion states) groups. In addition, time-varying controls at the state level were added to minimize confounding, including race, adult employment rate, and family income. X represents the summation of these covariates. ε represents the regression error term. To avoid

multicollinearity with the addition of state and quarter-year fixed effects, the *Post* and *Treatment* terms were dropped.

The objective of this analysis is to determine the effect of Medicaid enrollment on child ED visits. Thus, to further isolate this relationship, I also stratified the expansion states in my dataset into four quartiles based on total Medicaid enrollment change. If Medicaid enrollment was indeed an influential factor in child ED utilization, the ED visits frequency and payer share would correspondingly change based on how significantly Medicaid enrollment changed in each state post-ACA. Prior to the ACA, states had varying Medicaid enrollment eligibility levels. The ACA standardized the Medicaid enrollment eligibility threshold to 138% of the FPL for states opting in, leading states to adjust their previous thresholds by varying amounts. This subsequently affected the number of people who enrolled following implementation within each state. For example, prior to Medicaid expansion, California had a parental eligibility threshold set to 106% of the FPL, while Kentucky's parental eligibility threshold was only 57% of the FPL (Glied & Weiss, 2023). This disparity could subsequently result in a much larger proportion of the population being newly eligible to enroll in Kentucky compared to California, given this difference in thresholds.

Using the total enrollment change in a state to stratify states is an optimal way of measuring the impact of Medicaid expansion. Rather than categorizing states simply by variation in eligibility threshold jumps, total enrollment change accounts for the policy's direct effect on the number of individuals enrolled in a given state post-expansion. Aligning with past literature, we would expect that states with a greater increase in enrollment would experience more significant changes in the outcome of interest. Therefore, this stratification method is an effective

way to test this hypothesis and further capture the effect of Medicaid enrollment on child health behaviors.

Using data from the Kaiser Family Foundation, I calculated the average monthly percentage change in Medicaid enrollment from January 2014 to December 2015. Pre-ACA monthly Medicaid enrollment was determined by the average monthly number of individuals enrolled in Medicaid and CHIP from July 2013 to September 2013, with each monthly measurement based on the number of individuals enrolled as of the last day of that month. The states were then sorted into quartiles based on their respective average Medicaid/CHIP percentage change between the pre-ACA monthly enrollment (July - September 2013) and post-ACA monthly enrollment (January 2014 - December 2015).

Following this stratification, I then repeated the difference-in-differences analysis established above. Each quartile of expansion states was compared to the non-expansion states in my dataset to determine whether there were corresponding changes in either total child ED visits per 1000 children per quarter or payer share. The states in these quartiles largely align with previous studies that stratified Medicaid expansion states by post-Medicaid expansion enrollment change to determine its effects (Nikpay et al., 2017). Table 2 presents the states included in each quartile, as well as the average percentage change in enrollment.

Table 2: *ED Visits Per 1000 Children Per Quarter*

Quartile 1 0.11	Quartile 2 0.20	Quartile 3 0.32	Quartile 4 0.63
Hawaii	Illinois	New Jersey	California
New York	Iowa	Arizona	Nevada
Vermont	Massachusetts	Maryland	Kentucky
	North Dakota	Rhode Island	

*Minnesota was dropped due to various data inconsistencies

FINDINGS

In this section, I will present the results of the difference-in-difference analysis, followed by a discussion of its implications.

Table 3: *ED Visits Per 1000 Children Per Quarter*

	(1)	(2)
Treatment	-5.123*	
	(2.275)	
Post	-3.553	
	(2.599)	
Treatment x Post	3.691	3.612*
	(3.218)	(1.537)
Adjusted R Squared	0.008	0.875
Quarter-Year Fixed Effects	No	Yes
State-Fixed Effects	No	Yes
Controls	No	Yes

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3 presents both the unadjusted and adjusted regression difference-in-differences results for total ED visits. Parentheses denote standard deviations. As presented in Table 1, ED visits increased by 0.13 visits in expansion states and decreased by 3.55 visits in non-expansion states following implementation at the start of 2014. In the unadjusted model, this change led to an increase of 3.69 visits per 1000 children per quarter in expansion states. The addition of fixed effects and controls to the model exhibited little impact on the magnitude of the effect, only slightly lowering this number to an additional 3.61 visits per 1000 children per quarter in expansion states. However, the coefficient of interest in the adjusted model is statistically significant, suggesting that while controlling for variables minimized the effect, it also increased

the model's precision. With a p-value of 0.019, the adjusted model describes a positive causal relationship between Medicaid expansion and the rate of child ED visits post-2014.

Comparing the significance of the rate's magnitude is difficult, considering that past studies have provided conflicting results regarding the direction of ED visits following implementation. However, it is notable that the child ED rate calculated in this regression is greater than the adult ED rate (3.61 child ED visits compared to 2.47 adult ED visits) concluded in Nikpay et al., which used the same database and similar states and time periods. While one might assume a comparatively smaller child ED rate due to Medicaid's lesser effect on non-adult populations, it is thus surprising that this regression analysis reveals higher child ED utilization. If moral hazard indeed plays a significant role, this finding also reveals the necessity of considering other factors, such as demographic composition and time period, in influencing the outcome of interest.

Table 4: *Medicaid Expansion on Share of Medicaid Payers*

	(1)	(2)
Treatment	-0.088***	
	(0.012)	
Post	0.016	
	(0.014)	
Treatment x Post	0.016	0.002
	(0.017)	(0.005)
Adjusted R Squared	0.212	0.962
Quarter-Year Fixed Effects	No	Yes
State-Fixed Effects	No	Yes
Controls	No	Yes

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5: *Medicaid Expansion on Share Of Uninsured Payers*

	(1)	(2)
Treatment	-0.011*	
	(0.004)	
Post	-0.012*	
	(0.005)	
Treatment x Post	0.002	0.005
	(0.006)	(0.003)
Adjusted R Squared	0.052	0.871
Quarter-Year Fixed Effects	No	Yes
State-Fixed Effects	No	Yes
Controls	No	Yes

* p < 0.05, ** p < 0.01, *** p < 0.001

Table 6: *Medicaid Expansion on Share of Private Insurance Payers*

	(1)	(2)
Treatment	0.099***	
	(0.0013)	
Post	-0.004	
	(0.015)	
Treatment x Post	-0.018	-0.007
	(0.019)	(0.004)
Adjusted R Squared	0.052	0.871
Quarter-Year Fixed Effects	No	Yes
State-Fixed Effects	No	Yes
Controls	No	Yes

* p < 0.05, ** p < 0.01, *** p < 0.001

To further isolate the effect of Medicaid expansion on emergency departments, payer composition was also analyzed; Tables 4 through 6 outline the corresponding regression results. Parentheses denote standard deviations. Again, the addition of controls had little impact on the

effect's magnitude. Relative to the unadjusted model, the adjusted model generated less pronounced shifts in payer share. Overall, the adjusted relative changes in payer share yielded an increase of 0.2 percent for Medicaid and 0.5 percent for uninsured payers, along with a 0.7 percent decrease for the private share.

Unlike the adjusted regression model for the ED visit rate detailed in Table 3, this model does not predict a robust causal relationship between Medicaid expansion and shifts in payer composition, as the coefficients do not reach statistical significance. Additionally, while once more acknowledging the conflicting ED trends from my literature review, a direct comparison with Nikpay et al.'s study reveals that the payer composition shifts in my findings are considerably less pronounced. While this paper's analysis reveals that none of the Medicaid, uninsured, and private insurance shares shift by more than 1 percent, the relative changes in adult ED payer composition amounted to an 8.8 percent increase, 5.3 percent decrease, and 3.5 percent decrease, respectively, in the aforementioned study. When analyzing Medicaid expansion's impact on ED visits, these findings prompt questions into the policy's specific influence on Medicaid payers: given the significant increase in the total ED rate, which patient demographics and payer shares are responsible for driving that increase? A visual representation of all unadjusted models can also be found in Appendix C.

The above regression results provide a broad analysis of expansion states and non-expansion states. However, by primarily evaluating states on their decision to opt in or out of Medicaid expansion, my analysis fails to account for the differing impacts of the policy at the state level; the policy did not affect parental enrollment equally across states. Thus, I also tested the causal effect of the adult Medicaid enrollment change post-implementation. Table 6 displays these results for the adjusted model for the lowest and highest quartiles of states based on mean

Medicaid enrollment change, again comparing each quartile to the non-expansion states in my original dataset.

***Table** 7: Medicaid Expansion on Smallest and Largest Quartiles of Medicaid Enrollment*

	Smallest Enrollment	Largest Enrollment
Visits	2.014	3.534
	(2.747)	(2.984)
Medicaid Share	0.008	0.025**
	(0.008)	(0.008)
Uninsured Share	0.001	-0.023**
	(0.005)	(0.007)
Private Share	-0.009	- 0.001
	(0.006)	(0.007)

* p < 0.05, ** p < 0.01, *** p < 0.001

As outlined by the table, my findings indicate that the quartile of states with the largest Medicaid enrollment change exhibited the largest changes in both the number of visits and payer share. In other words, in a comparison between the lowest and highest quartiles, states that had the lowest income eligibility prior to the ACA (and therefore the largest eligibility increases) had a greater magnitude in the coefficients of interest. In the highest quartile, this yielded an additional 3.53 visits per 1000 children per quarter-year in expansion states. However, I do caution that the second and third quartiles do not follow this pattern, reporting a respective 1.15 and 1.67 additional visits. Considering the potential noise, I directed my analysis on the two quartiles on either extreme of Medicaid enrollment change.

Coefficients were also statistically significant for the Medicaid and uninsured payer shares. In the highest quartile, the Medicaid share increased by 2.5 percent and the uninsured share decreased by 2.3 percent, a much greater change relative to when the Medicaid enrollment change was not accounted for. Compared to the relatively negligible effects on the smallest quartile, these results confirm that the number of adults enrolling post-implementation directly

impacts ED utilization for children. Additionally, coupled with the significant increase in Medicaid enrollment, it also suggests that patients covered under Medicaid are the main drivers of this increase.

DISCUSSION

My paper investigates the impact of Medicaid expansion on the frequency and payer composition of pediatric ED visits through a difference-in-differences analysis. My results provide compelling evidence corroborating this association. Consistent with previous studies examining post-implementation ED rates, a notable uptick in ED visits in expansion states compared to non-expansion states emerged. Specifically, there was a relative increase of 3.61 additional visits per 1000 children per quarter-year in expansion states, equating to approximately 14 additional visits annually. More broadly, if we examine the child population of all expanded states as of 2021 - comprising roughly 50 million individuals - the effect of Medicaid expansion potentially accounts for more than 700,000 child ED visits in that same year (“Child Population Data,”n.d.).

In addition, while shifts in payer composition, particularly the increasing Medicaid share, did not reach statistical significance, they serve as indicators of broader trends in healthcare behaviors post-Medicaid expansion. If these trends continue, coupled with the rising rate of total ED visits, they raise concerns about the infrastructural and financial capabilities of emergency departments in expansion states. In particular, an escalation in the Medicaid payer share has implications for ED reimbursement rates, which traditionally skew lower than those for patients who are privately covered. However, research also indicates that Medicaid patients have a relatively lower average cost per ED visit, representing 31.5% of ED visits but only 25% of ED

costs in 2017 (Moore & Liang, 2020). Medicaid visits would also yield higher reimbursement rates compared to uninsured visits. A comprehensive analysis is needed to discern the overall impact of increases in the child Medicaid ED share.

Additionally, the final regression results confirm that the policy affects states differently; the Medicaid enrollment change at the state level varies based on each state's pre-Medicaid expansion eligibility criteria. Larger increases in Medicaid enrollment are associated with larger increases in ED visits among children. Notably, a 2.5 percent increase in the Medicaid payer share and 2.3 percent decrease in the uninsured share, both statistically significant, offer possible insight into possible directions the policy has encouraged shifts among the three insurance types.

Based on these results, I propose possible explanations for the mechanisms driving these changes. First, considering the largest quartile's notable Medicaid share increase and corresponding uninsured share decrease, it is likely that much of the ED utilization comes from newly enrolled Medicaid patients who were formerly uninsured. If true, this would confirm that Medicaid expansion indeed has spillover effects on child enrollment rates, as previously eligible but uninsured children gained Medicaid coverage. Medicaid expansion thus has positive welfare effects on the entire family unit.

However, these results also raise questions about the elasticity: the change in patient behavior in response to changes in ED visit prices. Assuming that urgent ED visits are relatively inelastic, the increase in total ED visits may have stemmed from an increase in moral hazard. Under this assumption, we presume that if a child has a true medical emergency, the payment mechanism does not matter. A parent will take their child to the ED regardless of whether or not the child is insured. However, for less-urgent visits, the cost may impact the decision to visit the ED. Thus, the shift of patients from uninsured to Medicaid explains the increase in total visits:

newly enrolled Medicaid patients are more likely to attend the ED, especially for non-urgent visits, if there is less financial cost for doing so.

Research appears to back this hypothesis. Generally, Medicaid beneficiaries face minimal to no out-of-pocket costs for ED visits, compared to the significant bills uninsured patients must bear. Out-of-pocket costs for uninsured visits range widely depending on the service provided, but can often reach thousands of dollars. Little disincentive is given to use the ED as a source of general medical care either: no state charges Medicaid patients more than $8 for non-urgent ED visits, and many demographics, including children, are exempt from this fee altogether (Joffe, 2023).

Additionally, the limited availability of primary care service further encourages ED use for non-urgent medical needs. Medicaid patients often face difficulty accessing primary care for several reasons. For example, these services are typically limited to regular business hours, posing a barrier to low-income parents unable to take time off or sacrifice potential income to attend a child's appointment. Medicaid patients also face difficulty finding primary care physicians accepting Medicaid coverage, due to low reimbursement rates and tedious bureaucratic hurdles (Lewis et al., 2019).

Alternatively, we can assume that regardless of urgency, parents heavily consider the cost of a child's ED visit – financial burden ultimately determines whether or not the child seeks care. If we again assume that the increase in Medicaid payer share resulted from a decrease in the uninsured payer share, then these newly-enrolled patients likely experienced the financial strain of ED costs when they were uninsured. Even if the visit was medically necessary, a parent might hesitate to seek ED care for their child without insurance coverage. In this context, a shift in patients from uninsured to Medicaid represents a positive welfare effect because the lack of

insurance may have deterred parents from bringing their child to the ED, even when it was urgent. Consequently, child Medicaid enrollment helps to alleviate the cost barrier. In this scenario, although ED visits increase, they may more accurately reflect true medical emergencies.

However, I cannot determine the validity of either hypothesis given my data limitations. Further research is necessary to understand the transitions across payer types at the individual level, as well as the composition of ED visits paid for by newly enrolled Medicaid patients after policy implementation.

All of my findings align with existing literature on the effects of Medicaid enrollment on adult ED visits, such as the study conducted by Nikpay et al. and the Oregon Health Insurance Experiment. However, it is important to once more acknowledge that although these spillover effects do seem to hold, the magnitude of these effects, especially concerning payer composition, appears to differ between adult and child populations. Medicaid expansion's target demographic of low-income adults may lead to a smaller effect on peripheral populations like children. Other demographic differences, such as the type and severity of visits, may also be influential.

In the introduction of my paper, I presented two plausible yet competing mechanisms that could potentially increase or decrease ED utilization for children following Medicaid expansion: parental enrollment could increase child preventative care utilization, or it could encourage overuse of the ED as its replacement. Through my research and findings, I suggest that the latter is the more influential factor: similar to conclusions drawn from established literature on adult ED visits, there is an indication that moral hazard may exert an effect on child ED utilization. While these observed effects are relatively modest compared to those documented for adults, they still indicate a tendency towards increased healthcare utilization. However, further research

must also be conducted to determine whether the increased Medicaid payer share encouraged ED utilization for all visit types, or whether the policy alleviated financial barriers for true medical need. Ultimately, these findings highlight a complex dynamic between healthcare preferences, utilization, and familial insurance, thus underscoring the importance of considering the far-reaching welfare effects of health insurance policy on healthcare utilization for different populations.

Limitations

Limitations due to data selection and analysis methods must also be addressed. First, HCUP includes CHIP enrollment in the Medicaid payer share of child ED visits. However, the CHIP enrollment eligibility levels vary widely between states, and the inclusion of CHIP ED visits may skew the data due to higher child enrollment in CHIP in specific states. However, on a national scale, many more children are enrolled in Medicaid compared to CHIP - 36.8 million children were enrolled in Medicaid and 8.4 million children were enrolled in CHIP in FY 2015 - although CHIP enrollment is still a sizable portion of this enrollment.

Similarly, the state-level enrollment change percentage pulled from the KFF and used to stratify the expansion states into quartiles captures everyone enrolled in either Medicaid *or* CHIP; this number thus includes parents, non-parents, and children. Consequently, parental enrollment is not singularly isolated in these enrollment change calculations, blurring the relationship between parental enrollment and child ED use.

Constraints such as limited state data and different start dates for policy implementation also have the potential to skew the data by narrowing the number of states included in the

analysis. The relationship described by the model is not representative of the entire U.S. population.

POLICY IMPLICATIONS

In 2022, the national pediatric uninsurance rate hovered around 5.1% (Williams & Rudowitz, 2024). As policymakers look to expand insurance coverage for children, this analysis reinforces the need for caution regarding the assumption that ED rates will lower correspondingly. Rather than a decrease in ED visits, this analysis revealed that Medicaid expansion and the increase in Medicaid enrollment encouraged ED utilization among children instead. Further analysis is needed to determine the causal mechanisms between familial insurance enrollment and ED use. However, based on my findings, I propose the following policy recommendations to improve child healthcare outcomes while also increasing efficient ED utilization.

1. Primary and Preventative Care Coordination

Although the ED serves as a crucial safety net for those in need of critical healthcare services, reducing unnecessary emergency department care should be the goal of all policymakers. However, it is plausible that Medicaid expansion increased the prevalence of unnecessary ED visits by decreasing financial risk. Often, these types of ED visits could have either been addressed in alternative settings or avoided altogether through the use of preventive and primary care. As established above, many studies have shown that increased insurance can decrease ED utilization – especially for non-urgent visits – if there is greater access to preventative care.

As such, I recommend that policymakers continue to investigate policy changes that alleviate the burden of accessing primary care. One of the most significant barriers is the limited availability of primary care physicians. In 2023, the American Medical Association reported that more than 83 million people resided in areas without satisfactory access to a primary care physician, in part due to a growing national physician shortage. Policies and programs directed towards incentivizing medical personnel to practice in Health Professional Shortage Areas (HPSAs), such as loan repayment programs, must be continually supported. Robust funding for Federally Qualified Health Centers (FQHC) – health centers or clinics that typically serve medically underserved areas – may also be considered.

Policies that promote preventative care will also likely yield positive results. Systems and mechanisms that are put in place to ensure that patients are continually receiving follow-up care and reminders of their healthcare appointments may discourage inefficient ED use.

2. Alleviating Parent Burden

In addition, as stated above, parents, especially those considered low-income, are disproportionately burdened with difficulties in bringing their children to check-ups, due in part to time constraints or the inability to forgo income. Programs that mitigate these barriers must also be bolstered, such as telehealth and virtual care visits. The COVID-19 pandemic necessitated the transition to these types of visits, and legislation designed to increase the efficacy of such visits could also reduce unnecessary ED care. Lastly, an expansion of school-based health clinics is also a possible way to eliminate this accessibility challenge, as students receive quality primary care without additionally burdening parents. In 2023, Congress passed the Bipartisan Safer Communities Act (BCSA), a law that strengthened Medicaid-based

behavioral health services for students in schools ("Bipartisan Safer Communities Act," n.d.). This program provides a helpful model targeting the common reasons for child ED visits (such as mental health) and generating specialized programs focused on reducing their prevalence.

3. Patient and Parent Education

Health insurance coverage has also been shown to concurrently increase the frequency of both high-value services (i.e. preventative care) and low-value services (i.e. non-emergent ED visits) (Cliff et al., 2019). Demand for low-value services is attributed to consumer preference for more care, fee-for-service payment systems, and misinformation regarding medical services (Verkerk et al., 2021). As a result, patients continue to seek care, even when it provides small marginal returns – either through overuse or through seeking the wrong kinds of services for their healthcare needs.

The pediatric population is unique in that much of its healthcare behavior is determined by parental factors. Parents both alleviate and contribute to many of the barriers to healthcare for children, who often cannot access these services on their own. Consequently, parents must be continuously informed of the types of healthcare services available to them and their children, as well as be provided the context in which each should be utilized. Effort needs to continue to be directed towards differentiating between high-value and low-value services to gain the most efficiency from their healthcare behaviors.

CONCLUSION

Health insurance plays a pivotal role in healthcare utilization, alleviating financial barriers and improving health outcomes. However, many Americans still lack coverage, in part

due to financial strain or a lack of awareness about viable options. Medicaid expansion marked a crucial milestone in healthcare affordability, essentially opening up a feasible pathway to health insurance coverage for millions of Americans. The legislation targeted low-income adults in an effort to reduce insurance-related health inequalities and facilitate access to health services. Yet, this expansion was optional, allowing individual states to determine their participation.

The policy not only opened the door to Medicaid coverage for millions of adults, but also generated a profound impact on the health insurance status of low-income children and their healthcare behaviors. This study sought to explore this parent-child dyad to understand how Medicaid expansion affects child utilization. Specifically, in this paper, I found that Medicaid expansion led to an increase in child ED rates in expansion states, along with a shift in the payer share toward patients covered under Medicaid. Assuming that parents bring their child to the ED for true emergencies regardless of financial status, these results implicate the influence of moral hazard on child and parent healthcare preferences, suggesting an inclination towards using the ED in place of primary care services. However, speculation that Medicaid expansion also facilitates much-needed ED care for newly enrolled patients should also be considered.

As research delves deeper into the relationship between parental health insurance and child healthcare utilization, attention should be directed towards analyzing potential shifts in ED visit type post-implementation, particularly within the Medicaid payer share. This analysis would provide a more robust understanding of whether child ED visits replace preventative care visits. Conducting research that closely links parent enrollment to child ED visits, especially within the same family unit, would add additional nuance to our current understanding of this relationship.

The spillover effects of Medicaid expansion on child ED visits serve as an important reminder to consider the holistic impact of the policy beyond the intended demographic. While

the ED serves as a crucial safety net, individuals should not be put into a situation where it acts as their primary access to care. Unraveling the mechanisms behind ED utilization post-policy implementation will inform future policy decisions, ultimately leading to the development of a more efficient healthcare infrastructure. Policymakers should continually search for initiatives that balance increased access to care with effective healthcare services.

Following his landmark legislation, President Obama reiterated that "health care is not just a privilege, but a right for every single American" ("Remarks by the President on the Affordable Care Act," 2016). The passing of Medicaid expansion is a reminder that as we strive to broaden our health insurance framework to encompass all Americans, particularly our most vulnerable populations, we must continually ensure that this right is not compromised. Mere access to healthcare is insufficient. It is crucial to delve into the intricate mechanisms that shape healthcare behavior, ensuring that we deliver the highest quality healthcare possible.

BIBLIOGRAPHY

AMA president sounds alarm on national physician shortage. American Medical Association. (2023). https://www.ama-assn.org/press-center/press-releases/ama-president-sounds-alarm-national-physician-shortage

American Community Survey (ACS). Census.gov. (2024, April 10). https://www.census.gov/programs-surveys/acs

Basu, S., & Phillips, R. S. (2016). Reduced emergency department utilization after increased access to primary care. *PLOS Medicine*, *13*(9). https://doi.org/10.1371/journal.pmed.1002114

Bommersbach, T. J., McKean, A. J., Olfson, M., & Rhee, T. G. (2023). National Trends in mental health–related emergency department visits among youth, 2011-2020. *JAMA*, *329*(17), 1469–1477. https://doi.org/10.1001/jama.2023.4809

Chester, A., Schmit, S., Alker, J., & Golden, O. (2016, July). *Medicaid expansion promotes children's development and family ...* Georgetown University. https://ccf.georgetown.edu/wp-content/uploads/2016/07/Maternal-Depression-4.pdf

Child Population Data. Children's Bureau. (n.d.). https://cwoutcomes.acf.hhs.gov/cwodatasite/population/index

Cliff, B. Q., Hirth, R. A., & Mark Fendrick, A. (2019). Spillover effects from a consumer-based intervention to increase high-value preventive care. *Health Affairs*, *38*(3), 448–455. https://doi.org/10.1377/hlthaff.2018.05015

Drake, P., Tolbert, J., Rudowitz, R., & Damico, A. (2024, February 26). *How many uninsured are in the coverage gap and how many could be eligible if all states adopted the Medicaid expansion?*. KFF. https://www.kff.org/medicaid/issue-brief/how-many-uninsured-are-in-the-coverage-gap-and-how-many-could-be-eligible-if-all-states-adopted-the-medicaid-expansion/

December 2023 Medicaid & Chip Enrollment Data Highlights. Medicaid. (n.d.). https://www.medicaid.gov/medicaid/program-information/medicaid-and-chip-enrollment-data/report-highlights/index.html

DeVoe, J. E., Marino, M., Angier, H., O'Malley, J. P., Crawford, C., Nelson, C., Tillotson, C. J., Bailey, S. R., Gallia, C., & Gold, R. (2015). Effect of expanding Medicaid for parents on children's health insurance coverage. *JAMA Pediatrics*, *169*(1). https://doi.org/10.1001/jamapediatrics.2014.3145

Giannouchos, T. V., Ukert, B., & Andrews, C. (2022). Association of medicaid expansion with emergency department visits by medical urgency. *JAMA Network Open*, *5*(6). https://doi.org/10.1001/jamanetworkopen.2022.16913

Glied, S. A., & Weiss, M. A. (2023, September 11). *Impact of the Medicaid coverage gap: Comparing states that have and have not expanded eligibility*. Impact Medicaid Coverage Gap: States Have and Have Not Expanded | Commonwealth Fund. https://www.commonwealthfund.org/publications/issue-briefs/2023/sep/impact-medicaid-coverage-gap-comparing-states-have-and-have-not#:~:text=The%20effects%20of%20expansion%20varied,and%20nonparents%20(Exhibit%201)

Gopalan, M., Lombardi, C. M., & Bullinger, L. R. (2022). Effects of parental public health insurance eligibility on parent and Child Health Outcomes. *Economics & Human Biology*, *44*. https://doi.org/10.1016/j.ehb.2021.101098

Healthcare Cost and Utilization Project (HCUP) Fast Stats. HCUP Fast Stats Data Tools. (n.d.). https://datatools.ahrq.gov/hcup-fast-stats/

History and Impact of CHIP. MACPAC. (2018, February 5). https://www.macpac.gov/subtopic/history-and-impact-of-chip/#:~:text=CHIP%20was%20created%20as%20part,program%20design%20compared%20to%20Medicaid.

History. CMS.gov. (n.d.). https://www.cms.gov/about-cms/who-we-are/history

Horwitz, S. Mc., Busch, S. H., Balestracci, K. M. B., Ellingson, K. D., & Rawlings, J. (2005). Intensive intervention improves primary care follow-up for uninsured emergency department patients. *Academic Emergency Medicine*, *12*(7), 647–652. https://doi.org/10.1197/j.aem.2005.02.015

Hudson, J. L., & Moriya, A. S. (2017). Medicaid expansion for adults had measurable 'welcome mat' effects on their children. *Health Affairs*, *36*(9), 1643–1651. https://doi.org/10.1377/hlthaff.2017.0347

Joffe, M. (2023, July 11). *Medicaid and Emergency Room Use*. Cato.org. https://www.cato.org/blog/medicaid-emergency-room-use

Jones, E. C. (2013). Supreme Court decision on the Affordable Care Act. *Neurology Clinical Practice*, *3*(1), 61–66. https://doi.org/10.1212/cpj.0b013e318283ffb9

Kowalski, A. E. (2023). Reconciling seemingly contradictory results from the Oregon Health Insurance Experiment and the Massachusetts Health Reform. *Review of Economics and Statistics*, *105*(3), 646–664. https://doi.org/10.1162/rest_a_01069

Lee, M., & Monuteaux, M. C. (2019). Trends in Pediatric Emergency Department Use After the Affordable Care Act. *Pediatrics*, *143*(6). https://doi.org/10.1542/peds.2018-3542

Lewis, C., Zephyrin, L. C., Abrams, M. K., & Seervai, S. (2019, May 15). *Listening to low-income patients and their physicians: Solutions for improving access and quality in*

primary care. Commonwealth Fund. https://www.commonwealthfund.org/blog/2019/listening-low-income-patients-and-their-physicians--improving-access-and-quality

Madeline Guth, R. G. (2023, February 17). *The effects of Medicaid expansion under the ACA: Updated findings from a literature review - report - 8891-06*. KFF. https://www.kff.org/report-section/the-effects-of-medicaid-expansion-under-the-aca-updated-findings-from-a-literature-review-report/

Mandal, B. (2019). Avoidable Emergency Department Visits: Differences Between Texas and Washington Medicaid Enrollees. *Journal of Health and Human Services Administration*, *42*(2), 142–166.

Medicaid Enrollment Changes Following the ACA. MACPAC. (2022, March 31). https://www.macpac.gov/subtopic/medicaid-enrollment-changes-following-the-aca/

Moore, B. J., & Liang, L. (2020, December). *Costs of Emergency Department Visits in the United States, 2017 #268*. Healthcare Cost and Utilization Project. https://hcup-us.ahrq.gov/reports/statbriefs/sb268-ED-Costs-2017.jsp

Moore, B. J., Stocks, C., & Owens, P. L. (2017, September). *Trends in Emergency Department Visits, 2006-2014*. Trends in Emergency Department Visits, 2006-2014 #227. https://hcup-us.ahrq.gov/reports/statbriefs/sb227-Emergency-Department-Visit-Trends.jsp

National Archives and Records Administration. (2016, October 20). *Remarks by the president on the Affordable Care Act*. National Archives and Records Administration. https://obamawhitehouse.archives.gov/the-press-office/2016/10/20/remarks-president-affordable-care-act#:~:text=We%20fought%20to%20make%20sure,(Applause.)

Nikpay, S., Freedman, S., Levy, H., & Buchmueller, T. (2017). Effect of the affordable care act medicaid expansion on emergency department visits: Evidence from state-level emergency department databases. *Annals of Emergency Medicine*, *70*(2), 215–225. https://doi.org/10.1016/j.annemergmed.2017.03.023

Perkins, J. (2013). Implications of the Supreme Court's ACA Medicaid decision. *Journal of Law, Medicine & Ethics*, *41*(S1), 77–79. https://doi.org/10.1111/jlme.12045

Piehl, M. D., Clemens, C. J., & Joines, J. D. (2000). "Narrowing the Gap." *Archives of Pediatrics & Adolescent Medicine*, *154*(8), 791–795. https://doi.org/10.1001/archpedi.154.8.791

Population distribution by age (CPS). KFF. (2022, September 21). https://www.kff.org/other/state-indicator/population-distribution-by-age-cps/?currentTimeframe=0&sortModel=%7B%22colId%22%3A%22Location%22%2C%22sort%22%3A%22asc%22%7D

Primm, K., Muraleetharan, D., & Gilreath, T. (2019). Use of emergency departments for preventative care among adults in the United States: Estimates from the 2017 national health interview survey. *The Journal of Emergency Medicine*, *57*(4), 578–586. https://doi.org/10.1016/j.jemermed.2019.06.004

Quadagno, J. (2014). Right-wing conspiracy? socialist plot? the origins of the Patient Protection and Affordable Care Act. *Journal of Health Politics, Policy and Law*, *39*(1), 35–56. https://doi.org/10.1215/03616878-2395172

Rose, S. (2013). *Financing medicaid: Federalism and the growth of America's Health Care Safety Net*. The University of Michigan Press.

Rosenbaum, S. (2011). The Patient Protection and Affordable Care Act: Implications for Public Health Policy and Practice. *Public Health Reports*, *126*(1), 130–135. https://doi.org/10.1177/003335491112600118

Rudowitz, R., Snyder, L., & Smith, V. K. (2015, October 15). *Medicaid Enrollment & Spending Growth: FY 2015 & 2016*. KFF. https://www.kff.org/medicaid/issue-brief/medicaid-enrollment-spending-growth-fy-2015-2016/

Rudowitz, R., Artiga, S., & Arguello, R. (2014, March). *Children's health coverage: Medicaid, chip and the ACA*. Kaiser Family Foundation. https://www.kff.org/wp-content/uploads/2014/03/8570-children_s-health-coverage-medicaid-chip-and-the-aca1.pdf

S.2938 - 117th Congress (2021-2022): Bipartisan Safer Communities Act | Congress.gov | Library of Congress. Congress.gov. (n.d.). https://www.congress.gov/bill/117th-congress/senate-bill/2938

Schubel, J. (2021, June 14). *Expanding Medicaid for parents improves coverage and health for both parents and children*. Center on Budget and Policy Priorities. https://www.cbpp.org/research/health/expanding-medicaid-for-parents-improves-coverage-and-health-for-both-parents-and

Scott, K. W., Liu, A., Chen, C., Kaldjian, A. S., Sabbatini, A. K., Duber, H. C., & Dieleman, J. L. (2021). Healthcare spending in U.S. emergency departments by Health Condition, 2006–2016. *PLOS ONE*, *16*(10). https://doi.org/10.1371/journal.pone.0258182

Sommers, B. D., Gawande, A. A., & Baicker, K. (2017). Health insurance coverage and health — what the recent evidence tells us. *New England Journal of Medicine*, *377*(6), 586–593. https://doi.org/10.1056/nejmsb1706645

Status of State Medicaid Expansion Decisions: Interactive Map. KFF. (2024, April 8). https://www.kff.org/affordable-care-act/issue-brief/status-of-state-medicaid-expansion-decisions-interactive-map/

Terlizzi, E. P., & Cohen, R. A. (2023). *Geographic Variation in Health Insurance Coverage: United States, 2022*. https://doi.org/10.15620/cdc:133320

Total Monthly Medicaid & Chip Enrollment and Pre-ACA Enrollment. KFF. (2024b, April 5). https://www.kff.org/affordable-care-act/state-indicator/total-monthly-medicaid-and-chip-enrollment/?currentTimeframe=0&sortModel=%7B%22colId%22%3A%22Location%22%2C%22sort%22%3A%22asc%22%7D

Trends in emergency department visits, 2006-2014 - HCUP. (2017, September). https://hcup-us.ahrq.gov/reports/statbriefs/sb227-Emergency-Department-Visit-Trends.pdf

Udalova, V., Powers, D., Robinson, S., & Notter, I. (2022, January 20). *Most vulnerable more likely to depend on emergency rooms for preventable care*. Census.gov. https://www.census.gov/library/stories/2022/01/who-makes-more-preventable-visits-to-emergency-rooms.html#:~:text=People%20in%20vulnerable%20populations%20%E2%80%94%20as,in%20the%20state%20of%20Utah.

Verkerk, E. W., Van Dulmen, S. A., Born, K., Gupta, R., Westert, G. P., & Kool, R. B. (2021). Key factors that promote low-value care: Views of experts from the United States, Canada, and the Netherlands. *International Journal of Health Policy and Management*, 1514–1521. https://doi.org/10.34172/ijhpm.2021.53

Williams, E., & Rudowitz, R. (2024, January 16). *Recent trends in children's poverty and health insurance as pandemic-era programs expire*. KFF. https://www.kff.org/medicaid/issue-brief/recent-trends-in-childrens-poverty-and-health-insurance-as-pandemic-era-programs-expire/#:~:text=The%20uninsured%20rate%20among%20children,for%20adults%20(Figure%204).

Zhao, F., & Nianogo, R. A. (2022). Medicaid expansion's impact on emergency department use by state and Payer. *Value in Health*, *25*(4), 630–637. https://doi.org/10.1016/j.jval.2021.09.014

APPENDIX A

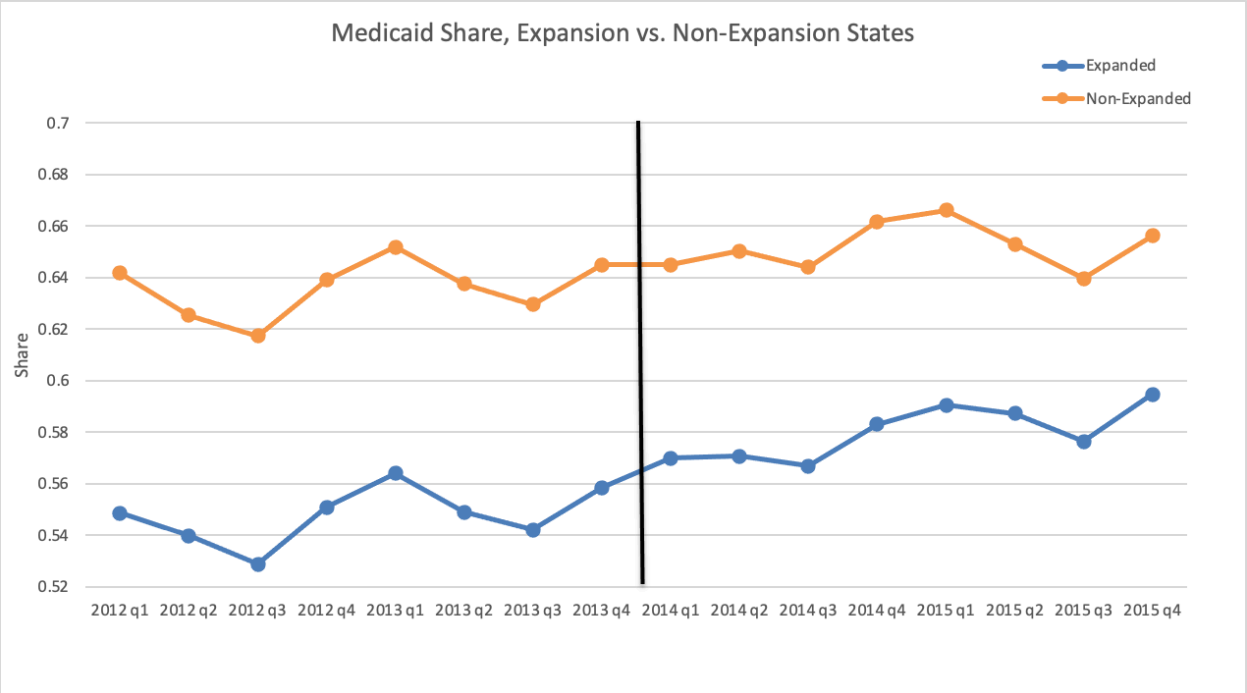
Expansion States		Non-Expansion States
Arizona	Minnesota	Florida
California	Nevada	Georgia
Hawaii	New Jersey	Kansas
Illinois	New York	North Carolina
Iowa	North Dakota	South Carolina
Kentucky	Rhode Island	South Dakota
Maryland	Vermont	Tennessee
Massachusetts		Wisconsin

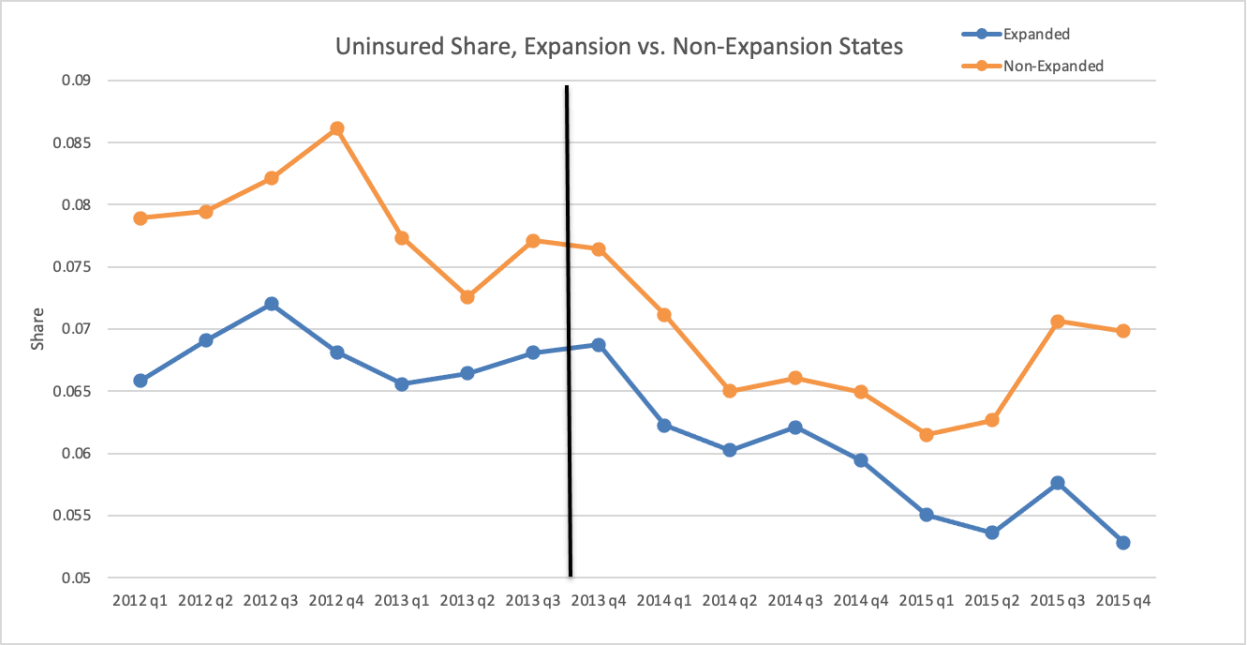
Medicaid Eligibility Levels for Non-Expansion States, Jan 2023

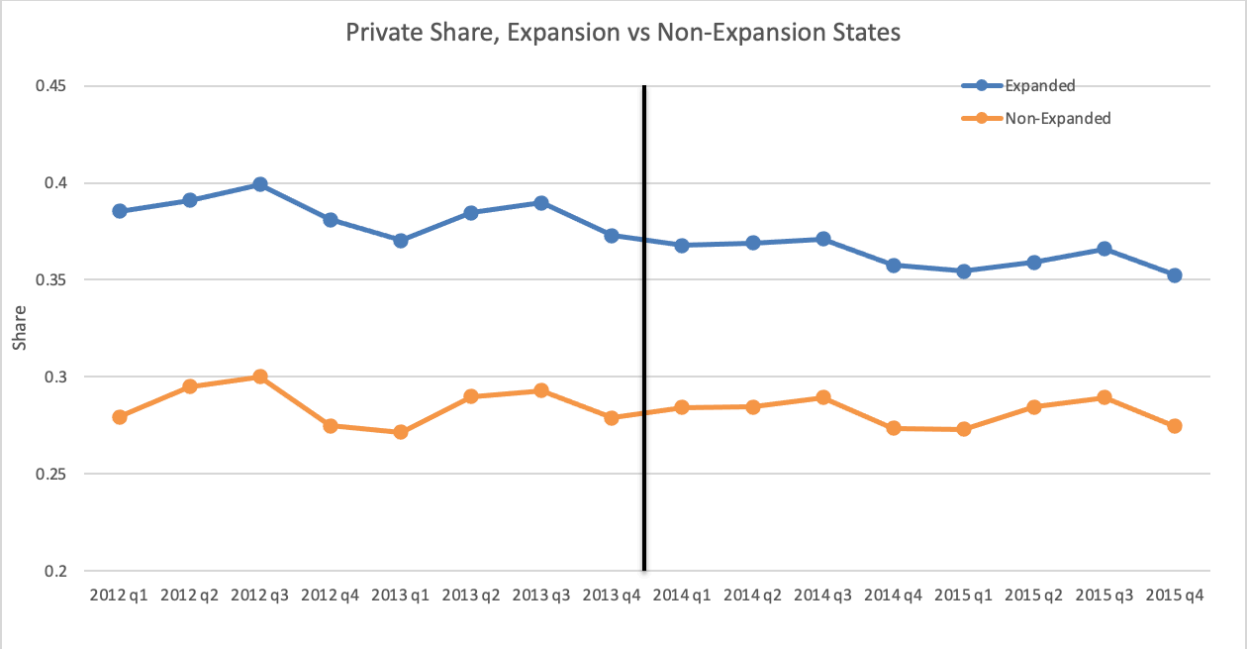
State	Parental (FPL)	Other (FPL)
Florida	28%	0%
Georgia	31%	0%
Kansas	38%	0%
North Carolina	37%	0%
South Carolina	67%	0%
South Dakota	43%	0%
Tennessee	82%	0%
Wisconsin	100%	100%

Note: Parental eligibility is presented as percentage of FPL for a family of three

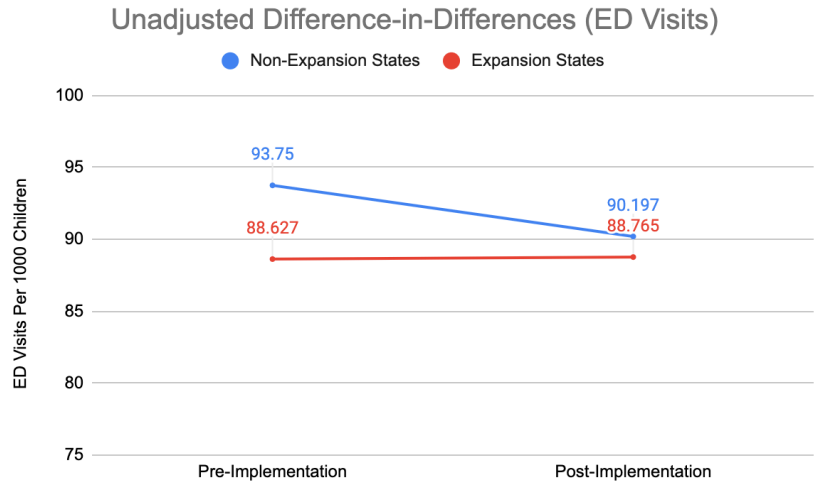
APPENDIX B

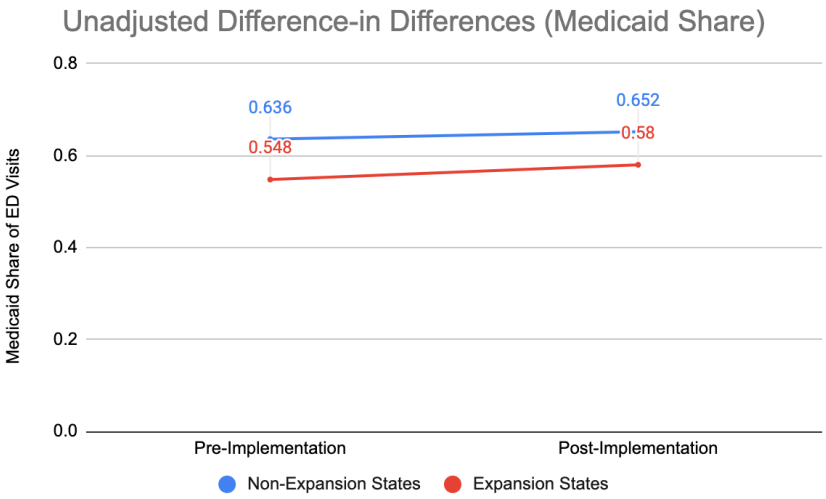

Medicaid Share, Expansion vs. Non-Expansion States
Expanded
Non-Expanded
Share
0.7
0.68
0.66
0.64
0.62
0.6
0.58
0.56
0.54
0.52
2012 q1
2012 q2
2012 q3
2012 q4
2013 q1
2013 q2
2013 q3
2013 q4
2014 q1
2014 q2
2014 q3
2014 q4
2015 q1
2015 q2
2015 q3
2015 q4

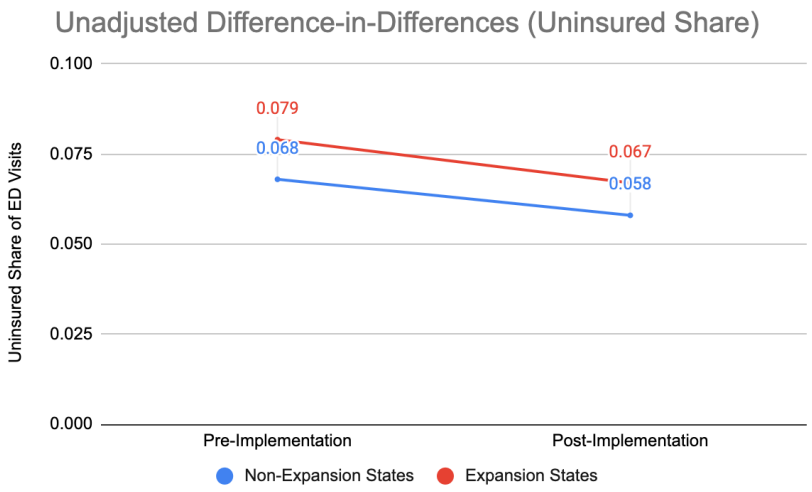

Uninsured Share, Expansion vs. Non-Expansion States
Expanded
Non-Expanded
Share
0.09
0.085
0.08
0.075
0.07
0.065
0.06
0.055
0.05
2012 q1
2012 q2
2012 q3
2012 q4
2013 q1
2013 q2
2013 q3
2013 q4
2014 q1
2014 q2
2014 q3
2014 q4
2015 q1
2015 q2
2015 q3
2015 q4

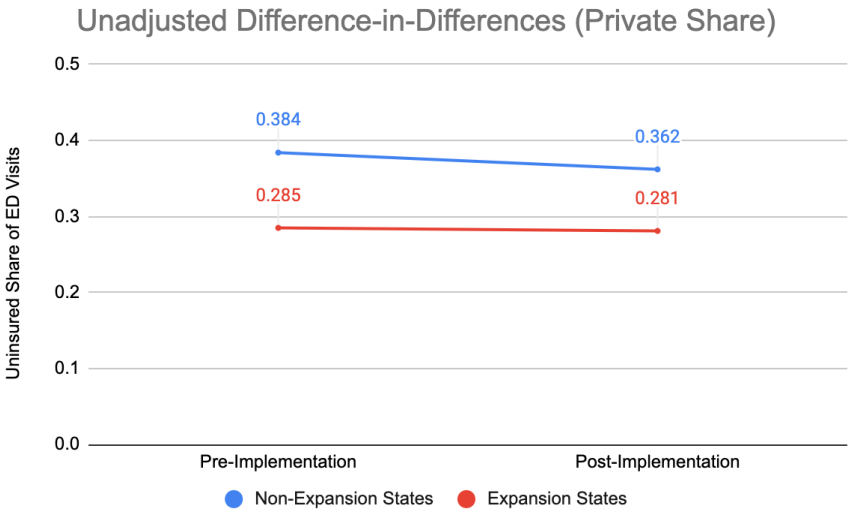

Private Share, Expansion vs Non-Expansion States
Expanded
Non-Expanded
Share
0.45
0.4
0.35
0.3
0.25
0.2
2012 q1
2012 q2
2012 q3
2012 q4
2013 q1
2013 q2
2013 q3
2013 q4
2014 q1
2014 q2
2014 q3
2014 q4
2015 q1
2015 q2
2015 q3
2015 q4

APPENDIX C


Unadjusted Difference-in-Differences (ED Visits)
Non-Expansion States
Expansion States
ED Visits Per 1000 Children
100
95
90
85
80
75
93.75
90.197
88.627
88.765
Pre-Implementation
Post-Implementation


Unadjusted Difference-in Differences (Medicaid Share)
Medicaid Share of ED Visits
0.8
0.6
0.4
0.2
0.0
0.636
0.652
0.548
0.58
Pre-Implementation
Post-Implementation
Non-Expansion States
Expansion States


Unadjusted Difference-in-Differences (Uninsured Share)
0.100
0.075
0.050
0.025
0.000
Uninsured Share of ED Visits
0.079
0.068
0.067
0.058
Pre-Implementation
Post-Implementation
Non-Expansion States
Expansion States


Unadjusted Difference-in-Differences (Private Share)
0.5
0.4
0.3
0.2
0.1
0.0
Uninsured Share of ED Visits
0.384
0.362
0.285
0.281
Pre-Implementation
Post-Implementation
Non-Expansion States
Expansion States