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AN EXAMINATION OF THE ASSOCIATION BETWEEN STATE MEDICAID
PERINATAL SERVICES AND BIRTH OUTCOMES

by
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A thesis submitted to the faculty of the University of Mississippi in partial fulfillment of
the requirements of the Sally McDonnell Barksdale Honors College

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March 2020

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AN EXAMINATION OF THE ASSOCIATION BETWEEN STATE MEDICAID
PERINATAL SERVICES AND BIRTH OUTCOMES

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ABSTRACT

This thesis investigated the connection between socioeconomic status, healthcare coverage, and birth outcomes. The research question that was posed specifically looked at twenty perinatal services that states covered under Medicaid to varying degrees to see their association, if any, with premature birth rates and low birthweight rates. State-level and Mississippi county-level data were compiled regarding preterm birth rates, low birthweight rates, presumptive eligibility adoption, and coverage of twenty different perinatal services. Using these data, the correlation between state Medicaid expansion status and birth outcomes was first calculated in order to determine if variation in birth outcomes was associated with expanded Medicaid coverage. After this, the relationship between birth outcomes and poverty was determined at both the state level and the Mississippi county level. The research found that poverty had a very positive correlation with high rates of poor birth outcomes and that state-level coverage was minimally correlated with birth outcomes. This study concluded by calling for further research into the Medicaid system, preventative care models for Medicaid, or systemic reform to the healthcare delivery system.

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TABLE OF CONTENTS

LIST OF TABLES	vi
LIST OF FIGURES	vii
INTRODUCTION	1
LITERATURE REVIEW	9
METHODS	29
FINDINGS.....	34
DISCUSSIONS AND CONCLUSIONS	51
REFERENCES.....	56

LIST OF TABLES

Table 1	Percentage of Total States that Cover Listed Perinatal Services.....	35
Table 2	Partial Correlations between Percentage of State Population Living in Poverty and Low Birthweight Rate, Preterm Birth Rate, and Breastfeeding Rate Controlling for Each Listed Perinatal Service.....	43

LIST OF FIGURES

Figure 1	Percentage of Families in Poverty and Premature Birth Rate.....	39
Figure 2	Percentage of Families in Poverty and Low Birthweight Rate.....	39
Figure 3	State Policy Index and Premature Birth Rate.....	40
Figure 4	State Policy Index and Low Birthweight Rate.....	40
Figure 5	State Policy Index Score and Percentage of Families in Poverty.....	41
Figure 6	State Policy Index Score and Percentage of Families with Children in Poverty.....	41
Figure 7	Percent of County Families Below Poverty Line and Premature Birth Rate.....	47
Figure 8	Percent of County Families Below Poverty Line and Low Birthweight Rate.....	47
Figure 9	Percent of County Families with Children Below Poverty Line and Premature Birth Rate.....	48
Figure 10	Percent of County Families with Children Below Poverty Line and Low Birthweight Rate.....	48
Figure 11	Percent of County Families Below Poverty Line Ranks and Premature Birth Rate Rank.....	49
Figure 12	Percent of County Families Below Poverty Line Rank and Low Birthweight Birth Rate Rank.....	49
Figure 13	Percent of County Families with Children Below Poverty Line Rank and Premature Birth Rate Rank.....	50
Figure 14	Percent of County Families with Children Below Poverty Line Rank and Low Birthweight Rate Rank.....	50

Introduction

In terms of lifetime milestones, pregnancy historically has marked one of the biggest transitions that a woman and those close to her undergoes mentally, physically, and emotionally. Likewise, complications with pregnancy often have taken a more significant emotional and financial toll on women and on families than many other issues. These complications, such as babies being born premature or with low birthweights, have been shown to correlate with other socioeconomic characteristics such as poverty and social stress. In the state of Mississippi, the Delta has had some of the highest rates of premature births, low birthweight births, and very low birthweight births due to the unique magnitude of the social and economic conditions seen in the region (Gennuso, Jovaag, Catlin, Rodock, & Park, 2016). The Delta region had higher rates of poor birth outcomes compared to the state of Mississippi, and furthermore the state of Mississippi had higher rates of poor birth outcomes compared to the rest of the country. This connection was often related to the fact that Mississippi has had one of the largest populations that live below the poverty line. An area of special interest within the state of Mississippi was the Delta, a region in the northwest corner of the state that has long experienced limited access to resources.

AN EXAMINATION OF [...] PERINATAL SERVICES AND BIRTH OUTCOMES

The Delta contained one of the highest rates of poverty and was “among the most socioeconomically disadvantaged areas of the United States” (Gennuso et al., 2016, p.1). Eudy even went on to specify that the “counties of the Mississippi Delta have experienced chronically higher incidence and prevalence of many types of morbidity and disease- specific mortality” (Eudy, 2008, p.1-2). Gennuso (2016) defined the Delta region as being 252 counties that are part of eight states bordering the lower region of the Mississippi River. Generally, the Delta “consists of the relatively flat and highly fertile lands bordering the Mississippi River” (Green, Greever-Rice, & Glass, 2015, p.107). Gennuso found that the Delta experienced higher rates of mortality, tobacco use, and drug and alcohol use (Gennuso et al., 2016). These socioeconomic health disparities have contributed to the high rates of preterm births and low birthweight births. Furthermore, the high rates of poverty likely led to more citizens being part of Medicaid due to the fact that they could not afford other health insurance. Therefore, a disproportionate percentage of people in the Delta may have been affected by the limited accessibility to early and complete prenatal care under the current Mississippi Medicaid policy.

The connection between poverty, policy, and birth outcomes were very closely intertwined with what researchers have called the social determinants of health. These social determinants of health are, generally, “the conditions in which people are born, grow, live, work and age that shape health” and “include factors like socioeconomic status, education, neighborhood and physical environment, employment, and social support networks, as well as access to health care” (Artiga & Hinton, 2018, p.2). In order to address these social determinants, the need to discuss reforms to both the healthcare system and other societal structures in our country was highlighted. These reforms, in

order to be effectively brought into a country, needed to be backed by the federal government or (at the very least) the state governments. In short, “addressing social determinants of health is not only important for improving overall health, but also for reducing health disparities that are often rooted in social and economic disadvantages” (Artiga & Hinton, 2018, p.2). While some initiatives, such as the accountable health communities, reimbursement reforms, and health homes have been put into place in recent years, many researchers have called for reform on a larger-scale. These reforms help to provide equitable healthcare to vulnerable and low-income populations and are federally funded. Reimbursement reforms, for example, have begun with research examining the difference in physician reimbursement for Medicaid vs. private health insurance and using federal funding to decrease the gap between the two.

Many researchers and people have pondered the reason for the higher rates of preterm births in the Delta as compared to the rest of the state of Mississippi and state rates as compared to the rest of the United States as a whole. Part of the explanation can be traced back to the arguments in the weathering hypothesis. The term weathering refers to “a physical consequence of social inequality” (Geronimus, 1996, p.1) that causes the body to age faster than is physically normal. This hypothesis was studied for its impact on racial health disparities in birth outcomes concerning the difference in the rate of low birthweight and very low birthweight births between white and African-American mothers (Geronimus, 1996). However, this hypothesis has also been connected to the higher rates and worse birth outcomes between places of different demographic characteristics and socioeconomic contexts, such as the Mississippi Delta as a whole. A person has experienced weathering when they have undergone a significant amount of

AN EXAMINATION OF [...] PERINATAL SERVICES AND BIRTH OUTCOMES

stress that was due to social inequalities – this can be anything from the stress experienced from racial discrimination to the stress experienced from living in a region of high and chronic poverty and not being able to afford basic essentials. The people of the Mississippi Delta experienced worse health outcomes and had less healthcare access than most areas of the country, which led to an unusual amount of stress due to “poor psychosocial status” (Copper, Goldenberg, Das, Elder, Swain, Norman, ..., & Meir, 1996, p.1). Copper et al. (1996) found that higher rates of mental illnesses such as anxiety and depression in a population were correlated with higher rates of premature birth and low birthweight children. Furthermore, tobacco use was highly associated with high levels of stress during pregnancy and therefore was connected to the rates of premature births (Copper et al., 1996). Mississippi’s population was very racially segregated in terms of socioeconomic status dating back to the Civil War and Jim Crowe eras, so those that experienced oppression due to race now often have lived in the regions of the state containing more people that live in poverty. Areas that typically experience higher rates of poverty often have less access to healthcare, which causes the inequalities to further increase. This form of present-day inequality can be tied back to eras from the past but is easily seen in health outcomes and inequalities in access based on socioeconomic status and the racial group that people belong to. The lack of effort that was put into making healthcare access and quality more equal after the dismissal of Jim Crowe has created a healthcare system in the state of Mississippi and in the Delta that cannot adequately provide care to the most vulnerable in the population.

When people and/or families make below a certain income threshold that was close to the poverty line, they qualify for a healthcare plan that is funded by the federal

government called Medicaid. Medicaid plays a central role in our country's healthcare system, primarily due to the fact that "the Medicaid program covers 1 in 5 low-income Americans, including many with complex and costly needs for care" (Rudowitz, Garfield, & Hinton, 2019, p.1). The authority on Medicaid falls somewhere between the federal and state governments. The federal government sets a baseline standard and allows the state governments "to administer Medicaid programs and have flexibility to determine covered populations, covered services, health care delivery models, and methods for paying physicians and hospitals" (Rudowitz et al., 2019, p.2). The states decide how they want to deliver this form of public healthcare and the federal government gives them the necessary funding to make it happen. Medicaid also helps to provide needed healthcare to pregnant mothers - Medicaid covers "nearly half of all births in the typical state" (Rudowitz et al., 2019, p.4). Medicaid also provides coverage to those in the most vulnerable populations in our country by insuring "83% of poor children; 48% of children with special health care needs and 45% of nonelderly adults with disabilities (such as physical disabilities, developmental disabilities such as autism, traumatic brain injury, serious mental illness, and Alzheimer's disease); and more than six in ten nursing home residents" (Rudowitz et al., 2019, p.4).

If Mississippi and other states took the steps to expand Medicaid past the federal requirement and/or adopted presumptive eligibility they would have been working towards creating a supportive environment for the most vulnerable mothers in their populations. Presumptive eligibility essentially referred to "a term used in federal legislation permitting states to allow certain providers (such as local health departments, community health centers, and hospitals) to determine temporary eligibility [for

AN EXAMINATION OF [...] PERINATAL SERVICES AND BIRTH OUTCOMES

Medicaid] and to provide prenatal care during the formal processing period” (Piper, Mitchel, & Ray, 1994, p.1626). The need for such a policy came from the idea that “adequate prenatal care has been shown to reduce the risk of poor birth outcomes, especially for women in the highest risk groups” (Braveman, Bennett, & Lewis, 1993, p.1285) that have often used Medicaid in order to try and receive prenatal care.

Presumptive eligibility for pregnant women specifically has been an option for states to add to their healthcare coverage in the United States since 1986. At the beginning of its existence, presumptive eligibility was only adopted by eleven states, including the District of Columbia. The Patient Protection and Affordable Care Act went into effect in 2010, after which nineteen more states adopted the policy under their Medicaid coverage (Green, Kerstetter, Haggard, Deleveaux, & Thompson, 2019). When looking at the benefits of offering coverage to more people, “many expansion studies point to improvements across a wide range of measures of access to care as well as utilization of a variety of medications and services” along with highlighting the idea that “improved access to care and utilization is leading to increases in diagnoses of a range of diseases and conditions and in the number of adults receiving consistent care for a chronic condition” (Antonisse, Garfield, Rudowitz, & Guth, 2019, p.5). This fact highlighted the importance of states covering not only prenatal services but also perinatal services under their Medicaid plans in order to provide pregnant and new mothers with needed support. The coverage of services that aid pregnant mothers directly after birth has the potential to influence breastfeeding rates and other health outcomes, which impacts the health and development of children as they grow up. States that have expanded Medicaid “have also found expansion to be associated with improvements in disparities by race/ethnicity,

AN EXAMINATION OF [...] PERINATAL SERVICES AND BIRTH OUTCOMES

income, education level, insurance type, and employment status in measures of access to and utilization of care” (Antonisse et al., 2019, p.6). This statistic was especially important for a state such as Mississippi that had high rates of inequality in health outcomes between racial groups.

While it has been difficult to trace poor birth outcomes directly back to whether or not states have presumptive eligibility (Green et al., 2019), studies have shown that states that expand Medicaid traditionally have seen a decrease in their rates of premature and low birthweight births (Baldwin et al., 1998). This difficulty came from the fact that when states expanded Medicaid to families that make less than or equal to 138% - or to any other percentage - of the poverty line, they got to decide what prenatal services expecting mothers were offered (Gifford & Walls, 2017). The 37 states plus the District of Columbia that did vote to expand Medicaid under the ACA had a large amount of flexibility in what services were covered under Medicaid due to the various ways that women could become eligible for coverage (Gifford & Walls, 2017). Seeking to understand what specific services within Medicaid made the relationship between poverty and poor birth outcomes less evident could help advance the world of public health and open doors to further research in terms of health insurance and our country’s healthcare system overall.

Looking past presumptive eligibility, it is important to note that states have many other options that allow them to support and take care of expecting mothers that qualify for public health insurance regardless of Medicaid expansion status. While expansion was a great first step in allowing more people access to healthcare, there are many perinatal services that states could cover. Increasing the income threshold that allows people to

AN EXAMINATION OF [...] PERINATAL SERVICES AND BIRTH OUTCOMES

qualify for Medicaid or covering more perinatal services are concrete ways for states to help to eliminate disparities in birth outcomes as a result of socioeconomic status. This thesis focused on twenty perinatal services, Medicaid expansion, and presumptive eligibility as ways to improve birth outcomes among those in poverty.

Literature Review

The literature for this thesis mainly focused on the social determinants of health, the weathering hypothesis, the status of the Mississippi Delta specifically, and Medicaid expansion across states. Beginning with social characteristics and their connections the health outcomes helped to set the stage for the rest of the hypothesis to develop by laying a foundation of understanding regarding how a person's socioeconomic demographic and characteristics associate with health outcomes. The weathering hypothesis was discussed as another possible explanation for the worse health of people living in poverty and racial minorities within the state of Mississippi. The review then went on to examine the Mississippi Delta through this lens in order to illuminate how its poverty and poor health statistics were intertwined. Lastly, the effects of Medicaid expansion on states' health outcomes and the effects of covering more perinatal services were discussed in order to transition into the methods section and effectively answer the research question.

A. The Connection between Income and Health Outcomes

As researchers began to increasingly understand the impact that socioeconomic class has on health outcomes, they became more interested in examining various social class characteristics and the specific effect that they each had on a person's health.

Logically, it made sense that a woman that had less money to buy nutritious food, access healthcare, and afford pregnancy supplies was at a higher risk of having complications

with pregnancy, but the question that was to be answered involved the specific mechanism by which economic stressors impacted pregnancy. This effect can be traced to social support as well, along with the idea that “social support entails some kind of relational transaction presumed to be an important source for reducing negative effects of stress or providing positive effects in the absence of any visible stressors” (Nkansah-Amankra, Dawhain, Hussey, & Luchok, 2009, p.774). This social support, however, only went so far depending on the overall income and level of income inequality of the neighborhood that the pregnant mother found herself in. Furthermore, racial disparities complicated these effects even more. One paper used the example that “a non-Hispanic black infant is more than twice as likely to be born low birth weight or preterm compared to a white infant” (Nkansah-Amankra et al., 2009, p.775).

Poverty and premature birth have had potential effects on physical and mental development in children. Green, Greever-Rice, and Glass cited low-birth-weight births as “an important predictor of the risk of developmental delays and school readiness” (2015, p.114). Furthermore, children that were born premature that had developmental delays experienced more significant setbacks if they were living in poverty than if they lived above the poverty line (Watson, Kirby, Kelleher, & Bradley, 1996). Watson, Kirby, Kelleher, and Bradley (1996) sought to understand if environmental or biological disadvantages played more of a role in developmental delays in terms of growing up in poverty or being born premature. These researchers wanted to understand the complex relationship between parenting/home environment and level of poverty. After controlling for parental and environmental variables, an interesting finding was that the “poor” group in the study had more African-American families and a higher percentage of low

birthweight babies. This finding connected to another source that discussed the unique stress of African-American and women living in poverty in society that contributed to poor birth outcomes (Rosenthal & Lobel, 2011). This study examined how African-Americans had higher rates of poor birth outcomes – premature birth and low birthweight births – and how these adverse outcomes caused developmental delays that ultimately put African-Americans at a disadvantage due to racial disparities. This paper discussed three stressors that African-American women faced that could cause poor birth outcomes – social pressures regarding pregnancy, an unfair medical system, and stereotypes (Rosenthal & Lobel, 2011).

The weathering hypothesis was the subject of a large amount of research with concern to racial disparities in birth outcomes, but was also connected to the disparities seen in birth outcomes between regions that were below the poverty line and those that were affluent (Copper et al., 1996). Copper et al. determined that mothers that experienced maternal stress due to factors such as stress, anxiety, and depression were more likely to have premature babies and babies that had a low birthweight. These researchers found that maternal stress was a significant contributor to the likelihood of a poor birth outcome (Copper et al., 1996). The ideas presented by Rosenthal and Lobel (2011) discussing the impacts of maternal stress on birth outcomes related directly to the work of Geronimus (1996) in understanding the weathering hypothesis. This paper sought to understand the weathering hypothesis overall and its impacts on birth outcomes on white and African-american mothers of various ages. Geronimus discussed how children that are African-American were more likely to be born before full term or with a low birthweight potentially due to weathering (Geronimus, 1996).

AN EXAMINATION OF [...] PERINATAL SERVICES AND BIRTH OUTCOMES

Holzman et al. (2009) worked to examine the effects of social weathering and birth outcomes in groups of white non-smoking women, white smoking women, black non-smoking women, and black smoking women. This study went off of the fact that “the association between preterm delivery risk and maternal age has also been frequently studied by means of data from vital records or epidemiologic studies” and that “studies have repeatedly shown higher preterm delivery rates among Black women in the United States and women in lower socioeconomic strata” (Holzman et al., 2009, p.1864). These researchers hypothesized that there are “multiple potential causes in the pathway to accelerated aging among Black and disadvantaged women, such as delays in accessing health care, employment-related adverse health effects, more obstacles to and fewer opportunities for a healthy lifestyle (e.g., exercise and diet), exposure to air pollutants, high-risk coping behaviors (e.g., smoking, alcohol use, and drug use), and excess stress caused by discrimination, violence, financial troubles, housing insecurity, and lack of instrumental social support” (Holzman et al., 2009, p.1864). The risk for the group of women belonging to black smokers was greater than that for white smokers, highlighting the accelerated aging that women belonging to racial minority groups experience. The women in the black non-smoker group were also at a higher risk for preterm birth than the women in the white non-smoker group.

With all of the social stresses placed on women of lower socioeconomic status, it was even more problematic when they did not have adequate healthcare or when their states did not cover the services that would have allowed them to receive equitable healthcare. Some states expanded Medicaid past the required income threshold to allow more women to qualify for public healthcare, and others did not. Likewise, not all states

AN EXAMINATION OF [...] PERINATAL SERVICES AND BIRTH OUTCOMES

covered the number of perinatal services under their Medicaid plans for women that did qualify. Creating an environment within states that allowed women that were affected by the conditions outlined in the weathering hypothesis to feel comfortable and supported by their healthcare system may have the potential to slow down or reverse the effects of social structures on these women's birth outcomes. One of the most feasible first steps that states could have taken towards creating this environment involved examining the services that they covered under their Medicaid plans, specifically the services that took care of pregnant women.

These challenges that those in poverty face require equitable services from our healthcare system, starting with states offering more services under their Medicaid plans or expanding the amount of people that are able to qualify for Medicaid. The mental stress placed onto women living in poverty could be off-set by a healthcare system that works to make each mother feel supported socially and physically. Medicaid provides a pathway to counteract the relationship between poverty and birth outcomes by serving as a cushion to those that need it the most.

B. The Mississippi Delta

For the purposes of this research, the Delta has often been referred to as an entire massive group of counties along the Mississippi River. These counties spanned state lines and often did not literally border the river itself. Much of the research for this thesis, however, focused on the Core Delta. This region was defined as the “eleven counties that fall fully in the flood plain of the Mississippi and Yazoo Rivers” (Green et al., 2015, p.117). This specific group of counties was “commonly known for intensive large-scale

agricultural production, rural isolation, limited educational attainment, low median household incomes, and high rates of poverty, with pronounced racial inequality” (Green et al., 2015, p.117). The Delta specifically highlighted the importance of racial identity and geographic location by acting as “the intersection of race and space” (Green et al., 2015, p.107). This definition of the Delta and more specifically of the Mississippi Delta allowed the research to take a closer perspective to the social and health-related issues that face these populations.

Literature established the connection between the poverty experienced in the Mississippi Delta and the rates of premature birth and low birthweight. This association had also been connected to the lack of prenatal care utilization by women in Mississippi, and primarily in African-American women (Cox, Zhang, Zotti, & Graham, 2009). Furthermore, it was well established that “insufficient or no PNC is associated with unfavorable birth outcomes” (Cox et al., 2009, p.932). The racial disparities seen in the utilization of prenatal care (PNC) had to do with the fact that “many Mississippi women have limited/no access to care outside of pregnancy” (Cox et al., 2009, p.932), that most women with little to no access to prenatal care lived in a rural area that has high rates of people that live below the poverty line (Cox et al., 2009), and ultimately that African-Americans in Mississippi were “more than three times as likely as whites to live in poverty” (Cox et al., 2009, p.932). Since those in poverty were primarily African-Americans, they experienced more stress and utilized less PNC than the average American citizen. This fact contributed greatly to the elevated rates of premature births and low birthweight births. Due to the racial stress and societal stress that many black women found themselves under (Geronimus, 1996), they did not trust medical

professionals or the healthcare system in general, which made them even less likely to seek out prenatal care.

Over time, the Delta became exceedingly unique in the degree of poverty it experienced due to “the legacy of the plantation economy, federal and state economic and social policy, the evolution of cultural norms, and engineered change in the river system itself” (Green et al., 2015, p.107). On top of the poverty, the culture led to an “eschewed investment in basic education, health, and other social infrastructure” and ultimately to the Delta being known as a region where “low levels of household income and both high inequality and poverty rates prevailed” (Green et al., 2015, p.110). Because of this culture, in recent years, “the limited educational and economic opportunities served to push people in search of a better life” (Green et al., 2015, p.111). This flight, however, often only applied to those that could afford to uproot their lives and move elsewhere. Statistically, the Delta populations were “less likely to have incomes at or above the medians for their respective states,” “higher rates of poverty among families with children,” and “higher rates than do their non-Delta counterparts of low-birth-weight infants” (Green et al., 2015, p.114). In summary, the Delta was “home to a population more likely to live in poverty and faces challenges to health, well-being, and opportunity” (Green et al., 2015, p.116)

The poor birth outcomes seen in the Mississippi Delta and other impoverished regions had implications that reached far into children’s development and beyond. A study found that being born early had significant impacts on educational advancement throughout childhood. It was also discovered that the effects of poverty became more pronounced as a child ages, and that various sociodemographic factors manifested

AN EXAMINATION OF [...] PERINATAL SERVICES AND BIRTH OUTCOMES

themselves differently throughout childhood (Resnick, Gueorguieva, Carter, Arier, Sun, Roth, ... , & Mahan, 1999). Children with low birth-weights and very low birth-weights were more likely to have a hard time in an educational setting and more likely to receive low marks in school (Resnick et al., 1999). These data showed how a high rate of preterm births and low birthweight babies manifested in a childhood population that struggled in an educational and social setting.

When looking at factors that affected the overall health of a population, space and race were two factors that needed to be especially considered in determining patterns of health outcomes (Green & Mitra, 2013). For example, the healthcare clinics and options in a certain region “mediate an individual’s access to the assets necessary for coping with a change by opening and closing pathways for development” due to the fact that “access to resources influences people’s capacity to handle” hardships that may be thrown into their lives (Green & Mitra, 2013, p.184). Due to many factors, there was a “trajectory of uneven development in the Mississippi Delta” (Green & Mitra, 2013, p.188) that affected both the economy and the health of the population. The Delta faced extremely limited options for healthcare and for insurance purposes - these few clinics became overwhelmed and overworked very easily. The Delta became one of the “spatial clusters of low life expectancy identified in the United States” (Green & Mitra, 2013, p.189) because of the effect that space and race had on health outcomes.

In the Mississippi Delta, there were many factors that affected the high rates of poor birth outcomes in both black and white mothers. One study sought to understand if a unique set of factors affected the Delta or if the same factors seen impacting the health of other populations were experienced to a higher magnitude in the Delta (Gennuso et al.,

2016). This study found that the Delta region experienced significantly higher rates of contributors to poor health and birth outcomes than other regions rather than being affected by a different set of unique factors (Gennuso et al., 2016). Furthermore, Eudy (2008) discussed the regional disparities seen in the Delta region overall with regards to health outcomes and the potential causes behind these differences. This study also discussed the implications that poverty had on infant mortality and birth outcomes, stating that poverty was one of the biggest contributors to the infant mortality seen in the Delta region (Eudy, 2008).

C. Medicaid Expansion and Other Policy Changes

Overall, literature has found that expanding Medicaid offered many positive benefits to the states that chose to do so. For example, “studies show that Medicaid expansion states experienced significant coverage gains and reductions in uninsured rates among the low-income population broadly and within specific vulnerable populations” (Antonisse et al., 2019, p.1). Furthermore, “Medicaid expansion has improved access to care, utilization of services, the affordability of care, and financial security among the low-income population” (Antonisse et al., 2019, p.1). This research highlighted the fact that an increase in the services and the percent of a population that was covered by Medicaid often had a strong correlation to an increase in positive health outcomes - especially among the populations that were most affected by the initial lack of healthcare coverage. Various bodies of literature have even said that the expansion of Medicaid “can result in state savings by offsetting state costs in other areas” (Antonisse et al., 2019, p.1) while also leading to “gains in employment as well as growth in the labor market”

AN EXAMINATION OF [...] PERINATAL SERVICES AND BIRTH OUTCOMES

(Antonisse et al., 2019). Specifically, Medicaid expansion was “associated with increases in cancer diagnosis rates (especially early-stage diagnosis rates) and access to and utilization of certain types of cancer surgery; increases in access to and Medicaid coverage of treatment (including medication assisted treatment) for opioid use disorder and opioid overdose; a reduction in the US poverty rate; and improvements in employment and the labor market” (Antonisse et al., 2019, p.2). Since previous research on specifically the adoption of presumptive eligibility did not seem to follow the same pattern, this thesis wanted to understand what Medicaid prenatal services might improve health outcomes among the less wealthy populations.

Community health centers came into society as a way to provide a quick-fix to the issue of access to healthcare in areas that had large populations at or below the poverty line. The first community health centers started in 1965 “as provision of primary care to a defined area or population” (Geiger, 2005, p.313), with the populations in these cases being those in the Mississippi Delta or in Boston public housing. These centers were started by people with a hopeful vision for healthcare and with intentions “to create a new, broader vision of healthcare, a new kind of healthcare institution to provide it, as a way of addressing the devastating links between poverty, race, and ill health in the United States” (Geiger, 2005, p.313). Community health centers were innovative in that they shifted healthcare for those living in poverty from long waits at underfunded “charity hospitals” to institutions that “featured personal health care from teams of physicians and other health professionals, often assigned to follow specific families; convenient locations and a focus on the communities to be served; outreach, child care, and transportation to help the severely deprived patients use the services; attention to the

economic and environmental factors that contributed to ill health; and involvement of the patients themselves in how the programs were set up and run” (Lefkowitz, 2007, p.8) .

The Delta Health Center, specifically, came as a result of local residents, civil rights movement activists, and freedom summer participants wanting to continue to work towards racial equality. These people decided to shape the health centers in a similar way to those that were present in South Africa (Geiger, 2005). These health centers have consistently increased positive medical outcomes in the populations that they served, which caused the national network of community health centers to steadily grow. They aided in “providing comprehensive primary care and health education to residents who were often discriminated against or barred from accessing regional facilities” (Centellas, Willoughby, & Green, 2019, p.10). The centers evolved and changed from their original framework along with our country, but still served the same purpose of providing low-cost, high-quality healthcare to populations that have limited access to physicians (Geiger, 2005).

In terms of health insurance and accessibility, “the problems that first engendered the model have in many respects deepened” (Geiger, 2005, p.319) due to the lack of universal healthcare in the United States. Just as community health centers came as a way to help bring equality to racial disparities in the Delta, other policy changes could have helped to fix socioeconomic disparities. These community health centers helped to provide an innovative avenue for populations that used Medicaid as their health insurance to gain access to needed healthcare. The centers allowed for patientcare to be paid for through Medicaid for these populations that had been living in poverty. The Affordable Healthcare Act provided \$11billion of funding towards Community Health Centers in

AN EXAMINATION OF [...] PERINATAL SERVICES AND BIRTH OUTCOMES

order to continue their impact on the most vulnerable populations due to reputation as “a critical component to improving health care efficiency and effectiveness” (Centellas et al., 2019, p.10). These innovations that began in the Mississippi Delta as a way to serve a community with little other access to healthcare still stand today as important avenues for patients to receive care that is covered under Medicaid. These centers allow public healthcare to reach populations that would otherwise not have access to affordable care from healthcare professionals.

Community health centers have found success in treating those that have no insurance and no way to pay out-of-pocket for healthcare services by evolving along with our country’s healthcare landscape. In the world of private and public health insurance, CHCs “receive insurance payments for those who are covered” and “use grant funds to care for all comers in their area without regard to ability to pay, charging the uninsured only nominal fees or a sliding schedule based on income” (Lefkowitz, 2007, p.26). Health centers are needed today more than ever because of the “increasing lack of insurance” and because “even if everyone were insured, people in many areas would still lack access to health care” (Lefkowitz, 2007, p.27). Health centers have consistently “outperformed other Medicaid managed care providers on standard quality and outcome measures” and their patients are “significantly less likely than those of other providers to use hospitals and emergency rooms for conditions that might have been prevented by good ambulatory care” (Lefkowitz, 2007, p.140). Community health centers help to bridge the gap in health outcomes caused by the “huge geographic inequality in insurance” and “widely varying state policies” (Lefkowitz, 2007, p.144) by providing

high-quality care to those that would otherwise struggle to have continuous and timely healthcare in other Medicaid managed care facilities.

One factor that is essential in preventing premature births and poor birth outcomes is the utilization of prenatal care early on in a pregnancy. Many mothers, however, could not afford other insurance and so their only hope for prenatal care was through Medicaid. One study examined the idea that an increase in reimbursement for physicians when treating Medicaid patients corresponded to an increase in the number of prenatal care visits received (Sonchak, 2014). This same study revealed that states had the most say over reimbursing physicians in terms of treating patients with Medicaid (Sonchak, 2014). It was found that the more often disadvantaged white mothers visited a prenatal health physician, the more their baby weighed at birth (Sonchak, 2014). Racial disparities in the quality and frequency of prenatal health visits directly impacted birth outcomes and childhood development in the Mississippi Delta (Cox et al., 2009). States such as New York have implemented programs within Medicaid that have protected pregnant women and encouraged them to utilize prenatal care (Joyce, 1997). One study found that the implementation of this program, the Prenatal Care Assistance Program, caused an increase in the utilization of prenatal care by women (Joyce, 1997).

The limited utilization of PNC by those in the Delta was traced back to various social factors such as cost and patient-physician interactions. The fact that a higher percentage of the African-American population lived in poverty when compared to the white population and that African-American women were less likely to utilize PNC for various reasons - trust, money, transportation issues, etc. - began to illuminate the cause of the correlation between poverty and preterm birth rates. Many states had less African-

AN EXAMINATION OF [...] PERINATAL SERVICES AND BIRTH OUTCOMES

American citizens than white citizens in their populations, so more white people were living in poverty when only examining numbers. Looking at the data in terms of percentages, however, revealed that a larger percentage of the African-American population lived in poverty than that of the white population. Furthermore, those in poverty were more likely to have Medicaid as their primary insurance plan and therefore may not get access to prenatal care until later on in the pregnancy (Cox et al., 2009).

Various policies highlighted the intersection between policy, professional practice, and ethical dilemmas due to their far-reaching nature. For example, the policy regarding presumptive eligibility existed in various states due to the assumption that “early, regular prenatal care reduces adverse pregnancy outcomes” (Piper et al., 1994, p.1626). This access to prenatal care was designed to protect women that did not have the financial means to see private physicians and that use Medicaid as their form of health insurance (Braveman et al., 1993). In order to fully understand the ethics behind the recommended adoption of presumptive eligibility, the researchers first looked at the need of women that typically used Medicaid for early access to prenatal care. Without presumptive eligibility, the approval process for Medicaid often took anywhere from forty-five to sixty days. This time was crucial for women that are affected by poverty due to their increased risk for poor birth outcomes already (Braveman et al., 1993). A woman that was protected by presumptive eligibility would have been able to receive prenatal care through Medicaid before she was approved as long as she had sent in her application and met basic thresholds. This policy greatly impacted professional practice in that it changed the cost for the patients that community health centers and other healthcare providers could see based on insurance. While the idea that using prenatal care decreased

the risks of poor birth outcomes makes sense, women in poverty have been shown as less likely and less able to utilize prenatal care due to the financial burden and the forty-five to sixty day wait time for approval discussed before (Cox et al., 2009). Therefore, in many regions with populations below the poverty line, mothers that would benefit the most from early prenatal care may be less likely to receive it due to the financial burden of seeing a physician and the wait time associated with Medicaid approval. One region that contained many populations like this is the Mississippi Delta. Therefore, it was established through the literature discussed above that the women from the Delta region are at a higher risk for poor birth outcomes than women from other regions of the state of Mississippi. Not only that, but these women are more likely to live in poverty and therefore not be able to afford insurance other than Medicaid. The mothers in the Delta that apply for Medicaid would not be able to be approved for almost two months – up to forty-five days (Green et al., 2019), making them even more at risk for an adverse birth experience. This cycle and set of circumstances posed an ethical dilemma that called for a correction in the form of policy change. The state of Mississippi had not at the time of this thesis adopted presumptive eligibility at the state-level - this placed pregnant women and their children at risk and therefore violated the ethical conscience of many physicians. Physicians were called to do what was best for each patient at all times, yet many were not able to do so due to the lack of this policy in Mississippi. Based on these data, the literature presented in this thesis supports the idea that the state of Mississippi adopted a policy requiring the assumption of eligibility for pregnant women that had applied for Medicaid in order to improve the health of pregnant women living in poverty in the state.

Further literature was needed in order to examine the ways that the implementation of Medicaid expansion affects health outcomes in states and counties that have clustered populations below the poverty line. Due to the “high-cost health care system” that the United States currently has, “insurance is largely responsible for determining who received adequate care” (Green & Mitra, 2013, p.192). Furthermore, it was shown that “insurance coverage influences health because it serves as a means of access to the system” (Green & Mitra, 2013, p.192). As a whole, the Southern region of the United States had a lower percent of the population covered by insurance than other regions (Brown et al., 2019). Mississippi was also one of the thirteen states that had not adopted the expanded Medicaid plan outlined under the Affordable Care Act, which made it more difficult for this large population with no insurance to receive any number of services even if they were to apply for and be approved for Medicaid (Antonisse & Rudowitz, 2019). Therefore, examining the ways in which states that have expanded Medicaid and specifically looking at how the expansion impacted birth outcomes among women could help for policy makers in Mississippi to better understand the need for potential Medicaid expansion and, at the least, implementation of the presumptive eligibility policy.

Another study found that states that have larger uninsured populations due to unexpanded Medicaid often have larger uneducated and poor populations as well (Brown et al., 2019). In Mississippi’s case, these uninsured populations were more often minorities than not. Literature reveals that Medicaid expansion aided in reducing the racial health disparities seen in poor birth outcomes (Baldwin et al., 1998). Therefore, although Medicaid expansion in terms of prenatal care did not often show a huge effect in

AN EXAMINATION OF [...] PERINATAL SERVICES AND BIRTH OUTCOMES

overall birth outcome statistics, it did have an impact in the communities that needed it the most. These data were used to support the idea that social support and societal structures played a huge role in birth outcomes among minority groups - the support of visits to the doctor for prenatal care helps the groups that did not have the same social support as more affluent groups before the Medicaid expansion. A study done in Washington state and Colorado showed that Medicaid expansion resulted in women beginning prenatal care earlier and completing more visits to the doctor on average (Baldwin et al., 1998).

Much of the issue surrounding presumptive eligibility had the potential to be traced back to the way in which a state's government decided to implement Medicaid. After the passing of the Affordable Care Act in 2010, states had the option to expand Medicaid according to the guidelines set out in the ACA. Due to court rulings, the expansion was not mandatory and was left up to the state government's decision (Antonisse & Rudowitz, 2019). This option left room for states to leave Medicaid with the same level of protection as before or allow it to expand in order to offer more services to a wider base of people. According to data collected in February of 2019, 37 states had adopted the Medicaid expansion that the ACA calls for (Antonisse, & Rudowitz, 2019). Expanding Medicaid involved the federal and the state government working together in order to find a model that works best for the given state. That being said, each state's new Medicaid plan often looked different depending on various demographic factors and the previous Medicaid plan the state had. Therefore, examining the ways in which states implemented Medicaid expansion in comparison to the connection between poverty and

poor birth outcomes allowed researchers to see the path to take in order to potentially enact presumptive eligibility and improve Medicaid access in a state such as Mississippi.

A study that examined Medicaid status across states showed that states that expand Medicaid saw a decrease in the racial disparities seen in low birthweight and premature births, but did not see an overall decrease in the same statistics statewide (Brown et al., 2019). In short, the most vulnerable groups in a state's population experienced comparatively lower rates of poor birth outcomes, but the rest of the population did not see the same decrease. In a state such as Mississippi, however, working to eliminate these racial disparities could help a large population of citizens due to the high percentages of people that are both minority and rely on Medicaid/do not have health insurance. In the Delta, where most of the citizens in poverty belonged to minority groups, seeing a decrease in disparities regarding poor birth outcomes impacted these citizens greatly. Another interesting finding revealed that states that expanded Medicaid often had higher incomes and levels of education than states that did not expand Medicaid (Brown et al., 2019). These data suggest that the states that expanded Medicaid were already set up to have lower rates of poor birth outcomes than states that did not expand before health insurance came into the picture. For example, when states such as Washington and Colorado expanded Medicaid fully to increase prenatal health services and increase physician reimbursement for providing prenatal care, they saw a decrease in the rate of prenatal care in minority or marginalized groups (Baldwin et al., 1998). The data were tied back to the weathering hypothesis discussed earlier and were used to support the idea that Medicaid expansion that began to cover prenatal care helped reduce racial and social disparities seen in the world of healthcare. The groups that were helped

most by Medicaid expansion were those that were the most vulnerable or that had the highest-risk conditions (Baldwin et al., 1998). The states that did see slight overall reductions in the rates of unfavorable outcomes had higher percentages of black citizens than those that did not see any change in their rates.

One study went on to investigate the varying services covered under Medicaid in states that expanded its services (Gifford & Walls, 2017). Most states that expanded coverage kept the same services available for all women, regardless of their reason for eligibility. The study asked questions regarding what services states covered in the categories of prenatal, counseling, delivery/postpartum, and breastfeeding (Gifford & Walls, 2017). Fewer than fifty percent of the states offered educational services to mothers, and almost every state offered support and services to mothers suffering from substance abuse disorder. Births in clinics or centers were covered by nearly all states, while births at home were only covered by half of the states. In terms of breastfeeding, many states covered the cost of breast pumps, but many had size and authorization thresholds to limit usage by the mothers. Overall, it was found that most states covered basic prenatal care but very few states covered services that help post-delivery such as childcare/breastfeeding classes, and lactation consultations.

D. Moving Forward

The Mississippi county-level data were also included and analyzed in order to provide a more micro-level perspective to the connection between poverty and birth outcomes. The county data illuminated how large the variation of birth rates among counties truly was and allowed the researchers to understand the way in which something so seemingly

AN EXAMINATION OF [...] PERINATAL SERVICES AND BIRTH OUTCOMES

small as state policy had mattered so much for the counties with higher percentages of people living in poverty. Furthermore, it served to shed light on the idea that even a small policy change at the state level may have the potential to influence the counties in Mississippi that had a higher percentage of the population that lived in poverty and worse birth outcomes.

Based on the literature covered, the research question was “What is the association between the number of perinatal services covered by a state’s Medicaid plan and birth outcomes among mothers?”. It was hypothesized that the more services a state covered, the better the state’s birth outcomes would be among those that live in poverty. State’s Medicaid expansion status and breastfeeding rates were also examined in connection to poverty rates in order to gather more knowledge about what affects birth outcomes among large populations. Examining state level data allowed for the data to be analyzed at the macro level and gave the researchers insight into societal patterns across the country.

Methods

In order to effectively examine if the adoption of various perinatal services by status helped to decrease the rate of premature births and low birthweight births in each state and to communicate the need for a change regarding Mississippi's Medicaid coverage policy and Medicaid expansion status, data analysis and policy analysis were the two methods primarily used. The methods focused primarily on the state-level was the relationship between poverty, Medicaid coverage, and poor birth outcomes.

Furthermore, this thesis sought to find the perinatal service(s) that states cover under Medicaid that potentially disrupt the relationship between poverty and birth outcomes. The policy analysis and statistical analysis also looked into breastfeeding rates among states and their relationship to poverty percentages in those states, as another health-related outcome beyond poor birth outcomes. Finally, the relationship between poverty and birth outcomes at the Mississippi county-level was examined in order to explore the connection at a micro level and to open the door for discussion on how policy change could impact communities that have the highest percentage of people living in poverty.

The first part of my thesis research involved examining all states' policies regarding Medicaid and women obtaining early prenatal care and how these policies potentially influenced the rates of premature births and low birthweight births in the year 2016. This policy scan involved examining various literature sources, primarily from the Kaiser Family Foundation, and state healthcare websites in order to determine if a

AN EXAMINATION OF [...] PERINATAL SERVICES AND BIRTH OUTCOMES

particular state's Medicaid plan covered one of twenty perinatal services that were researched in depth. The twenty perinatal services were decided on based on the goal of conducting research on a wide array of services in order to obtain a large amount of information on state policy and based on the accessibility and detail of state healthcare coverage data. In order to effectively document the gathering of these data, an Excel spreadsheet was constructing detailing the coverage of all fifty states and the District of Columbia and their coverage of each perinatal service, Medicaid expansion status, and status on the adoption of presumptive eligibility. If a state covered the service, they were given the score of "1" on an excel spreadsheet and a "0" if they did not. A column was added to the spreadsheet that summarized the percent of perinatal services covered by each state under their Medicaid plan in the form of a decimal. This decimal was called the "State Policy Score Index" and allowed a point of quick comparison in terms of coverage across all states. This spreadsheet allowed for a comparison between state-level Medicaid coverage and Medicaid expansion status.

I then examined the rates of premature births from 2016, 2017, and 2018 and the low birthweight births from 2016 , 2017, and 2018 across all states while comparing these rates to state policy index scores to see if allowing women to receive more perinatal services during pregnancy results in a decreased rate of premature births and low birthweight births. The preterm birth rate and the low birthweight rate data came from the March of Dimes website in their peristats section. The March of Dimes website worked to compile their data with help from the Center for Disease Control and Prevention. These rates were added as columns in the Excel spreadsheet in order to further compare state Medicaid coverage, birth outcomes, and Medicaid expansion status. I then used data

AN EXAMINATION OF [...] PERINATAL SERVICES AND BIRTH OUTCOMES

from the US Census Bureau in order to obtain the percentage of families in poverty and the percentage of families with children in poverty for each state from the year 2016.

These data were added as columns to the Excel spreadsheet to effectively compare states based on their Medicaid expansion status, percentage of the population living in poverty, rates of poor birth outcomes, and state-level Medicaid coverage of perinatal services.

To graphically analyze the compiled data at the state-level, several scatter plots were created that compared the percentage of families in poverty vs. premature birth rate, percentage of families in poverty vs. low birthweight rate, state policy index score vs. premature birth rate, and state policy index score vs. low birthweight rate. These scatter plots helped to see the potential relationship between all of these variables and to examine if states with higher poverty or lower index scores had higher rates of premature and/or low birthweight births. Next, the states were grouped into median halves and quartiles based on their index policy score. Bar graphs were then created that compared the average/median premature birth rates and low birthweight rates of each median group and quartile group. These bar graphs were made in order to see the relationship between birth outcomes as various states' policy index scores increased. I then used the statistical analysis tool SSPS to analyze the bivariate correlations between the average premature birth rate, the average low birthweight rate, and the breastfeeding rate of each state. SSPS was then used to determine the partial correlation between the average premature birth rate, the average low birthweight rate, and the breastfeeding rate while controlling for each perinatal service, stated Medicaid expansion status, and state presumptive eligibility adoption status.

AN EXAMINATION OF [...] PERINATAL SERVICES AND BIRTH OUTCOMES

The next part of my research involved examining the rates of poverty between the counties of Mississippi from the year 2016 and the rates of low birthweight births and premature births from the year 2018 in order to show the correlation between poverty and premature births at a more micro-level. The birth outcome rates were obtained from the Mississippi Statistically Automated Health Resource System website via the Mississippi State Department of Health and the percentage of families and families with children in poverty for each county were obtained from the US Census Bureau website, drawing from the American Community Survey 2016 five-year estimates. These rates were all put into an Excel spreadsheet in order to compare counties in a similar way to the way states were compared.

The data that were collected on the various counties within the state of Mississippi, specifically on the rate of premature births, the rate of low birthweight births, the percentage of families in poverty, and the percentage of families with children in poverty within each county were used to then give each county a ranking based on their respective rates and sorted based on their rank. Scatter plots were created that compared the percentage of families in poverty vs. premature birth rate, the percentage of families in poverty vs. low birthweight rate, the percentage of families with children in poverty vs. premature birth rate, and the percentage of families with children in poverty vs. low birthweight rate at the county level. The same scatter plots were then recreated using the county ranks instead of their exact rates and percentages. These scatter plots shed light on the relationship between poverty and birth outcomes specifically within the state of Mississippi. This part of my research concluded upon the establishment of the relationship between poverty and premature birth at the county-level in order to begin to

think through the potential implications of state policy change on Mississippi counties with the greatest economic challenges.

The goal of the methods used in this research was to examine how state level variation in Medicaid expansion and utilization affects poor birth outcomes both between states and between counties in Mississippi that are affluent and that have populations that live below the poverty line. It was expected that looking at the ways in which various states have expanded their Medicaid policy and implemented presumptive eligibility within Medicaid would help to shed light on the ways in which Mississippi can bring about the same change in policy. Examining Medicaid implementation between states, specifically concerning how/whether or not states adopted the Medicaid expansion outlined in the Affordable Care Act, allowed further discussion regarding how expanding Medicaid and implementing presumptive eligibility can improve the overall health of a population and reduce healthcare costs within a county and a state. My data sources largely came from statistical data regarding health outcomes and Medicaid expansion. Other data originated from examining specific Medicaid policies of various states and presumptive eligibility policies.

The literature also expanded upon the idea that expanding Medicaid allows for more equitable healthcare in the less-wealthy counties of Mississippi and other states. This newfound access to healthcare helps to reduce the rate of poor birth outcomes in many marginalized groups. The effect that this expansion has on a state's overall rate of premature births depends on the state's minority population size. The lack of correlation between services covered and health outcomes was also discovered and was discussed.

Findings

A. Findings Overview

In this chapter, the data collected were examined in the form of various tables and graphs. As discussed, twenty Medicaid allowable perinatal services were researched across all fifty states. First, the percentage of states that cover each service under their Medicaid program was shown in the form of a table. After that, the state-level data were presented. The state data were covered by comparing the correlation between poverty percentage and birth outcomes, birth outcomes between states that have and have not expanded Medicaid, between states based on their policy index score, policy index score and birth outcomes, and policy index score and poverty percentage. Next, statistical analysis was performed in order to determine correlation coefficients and partial correlation coefficients between poverty and birth outcomes while controlling for specific perinatal services. After that, the county-level data were presented in order to examine the connection between poverty and birth outcomes at the county level within the state of Mississippi. The data containing information on the poverty rate and rates of poor birth outcomes by county were included in analysis in order to show how deeply the relationship between poverty and health has manifested itself into the fabric of our country. The county level data also served to show the shocking disparities in the state of Mississippi regarding percentage of the population living in poverty and birth outcomes.

B. State Medicaid Coverage Percentages

Table 1 - Percentage of Total States that Cover Listed Perinatal Services

Perinatal Service	Percentage of States that Cover Service as of 2019
Presumptive Eligibility for Pregnant Women Adopted	58.87
Prenatal Vitamins	100.00
Ultrasound	100.00
Genetic Counseling	80.39
Chorionic Villus Sampling	94.12
Amniocentesis	97.08
Childbirth Education Classes	37.25
Infant Care/Parenting Education Classes	45.10
Case Management	81.63
Substance and Alcohol Abuse Treatment	96.08
Prenatal Home Visits	78.43
Postpartum Home Visits	84.31
Birth Centers	78.43
Home Births	52.94
Postpartum Visit	100.00
Electric Breast Pump	82.35
Manual Breast Pump	74.51
Breastfeeding Education Services	62.75
Hospital-Based Lactation Consultant	52.94
OP/Clinic Lactation Consultant	33.33
Home Visit Lactation Consultant	23.53

AN EXAMINATION OF [...] PERINATAL SERVICES AND BIRTH OUTCOMES

Twenty perinatal services were examined across all fifty states. From the tables created, it was found that few states cover childbirth education classes, parenting education classes, or lactation consultations. All states covered prenatal vitamins, an ultrasound, and postpartum physician visits under their Medicaid program. About half (56%) of states had adopted presumptive eligibility as part of their coverage plan and thirty-four states had expanded Medicaid past the required level. Two states were considering or in the process of expanding Medicaid past the required point but have not yet. Below is a table that summarizes the percentage of states that covered each perinatal service in their Medicaid plan.

C. Comparing States Based on Medicaid Expansion Status

State Medicaid expansion has been an option since the ACA - Affordable Care Act - put into effect in the year 2010. Since then, thirty-seven states have expanded Medicaid past the required level and fourteen states have not (these numbers include Washington D.C.). Generally, there was little to no connection found between state expansion and number of perinatal services covered out of the twenty examined. This means that a the states that had expanded Medicaid did not necessarily offer more perinatal services to those that qualified, they just covered a larger number of people. The primary influence that state Medicaid expansion had on populations was that expanding allowed more low-income families to have access to a reliable healthcare plan and provider.

When comparing states that have and have not expanded Medicaid, the data revealed that states that have not yet expanded Medicaid past the required level had

higher average and median preterm birth rates and low birthweight rates. There was 0.85% difference between the two groups for average preterm births, 0.50% difference for average low-birthweight births, 0.90% difference for median preterm births, and 0.40% difference for median low-birthweight births. These patterns were consistent with each other and with the predicted and expected trends. While the rates are not dramatically different, this disparity supported the idea that states that offered coverage to more people had better birth outcomes. The graphs were not included in this report due to the lack of separation seen between the two groups and the inconclusive results.

D. Comparing States Based on Policy Index Scores

When the graphs comparing the median groups of states based on their policy index score and their median/average preterm and low birthweight rate were examined, it was shown that while states below the median policy index score did have a higher average preterm birth rate, the states above the median policy index score had a higher median preterm birth rate, average low birthweight rate, and median low birthweight rate.

When the states were grouped into quartiles based on their policy index score, the graphs regarding the average and median low birthweight rates between the quartile groups did not follow the same pattern as the median groups. The graphs that compared the states in groups of quartiles rather than in median groups seemed to follow the predicted trend more closely, but not by a large margin.

The graphs depicting the lack of relationship seen between policy index score and birth outcomes were not included due to their inconclusive results. It was decided that

analysis using scatter-plots to examine further relationships between poverty and birth outcomes would be more beneficial.

E. State Scatter-Plot Data

When scatter plots were created that compared poverty, policy index scores, and birth outcomes, the data ranged from showing a strong correlation to little correlation depending on if state policy index score or poverty were being compared to birth outcomes. It was found that there was a positive correlation between the percentage of families in poverty and low birthweight rates/preterm birth rates, as suggested by the literature and show in Figures 1 and 2. This positive correlation could come as a result of accelerated aging due to maternal stress, lack of access to adequate prenatal care in less affluent neighborhoods, or lack of monetary or social resources to provide mothers with relatively stress-free environments during pregnancy.

There was little to no correlation found for the relationship between state policy index score and low birthweight rate/preterm birth rate and between state policy index score and the percentage of families in poverty, as shown in Figures 3-6. While it had been established that those with the lowest socioeconomic status had the worst health outcomes, it had not been shown that the states that cover the most perinatal services under their Medicaid plans had the best birth outcomes. The lack of correlation could stem from the difficulty that our healthcare system currently has with treating the chronic conditions seen in many Americans today. This disconnect came from a variety of sources and helped to highlight just how complicated the web of healthcare and societal structure truly was.

Figure 1: Percentage of Families in Poverty and Premature Birth Rate

N=50 States

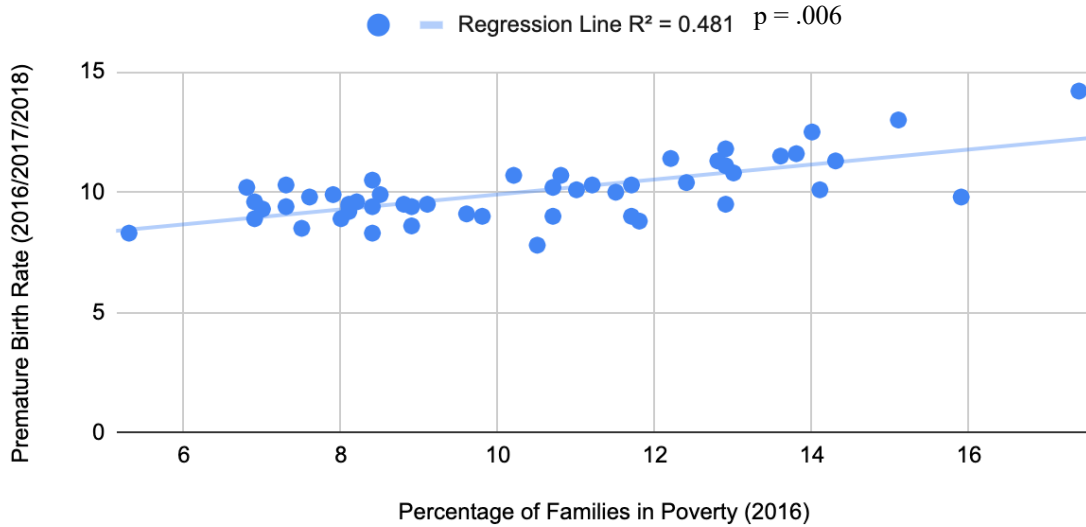


Figure 2: Percentage of Families in Poverty and Low Birthweight Rate

N=50 states

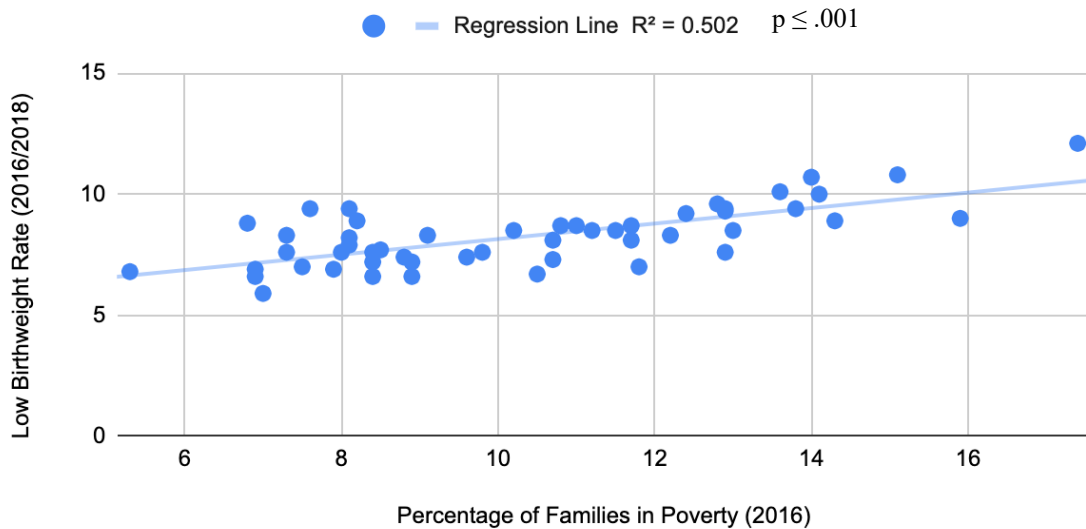


Figure 3: State Policy Index and Premature Birth Rate

N=50 States



Figure 4: State Policy Index and Low Birthweight Rate

N=50 States

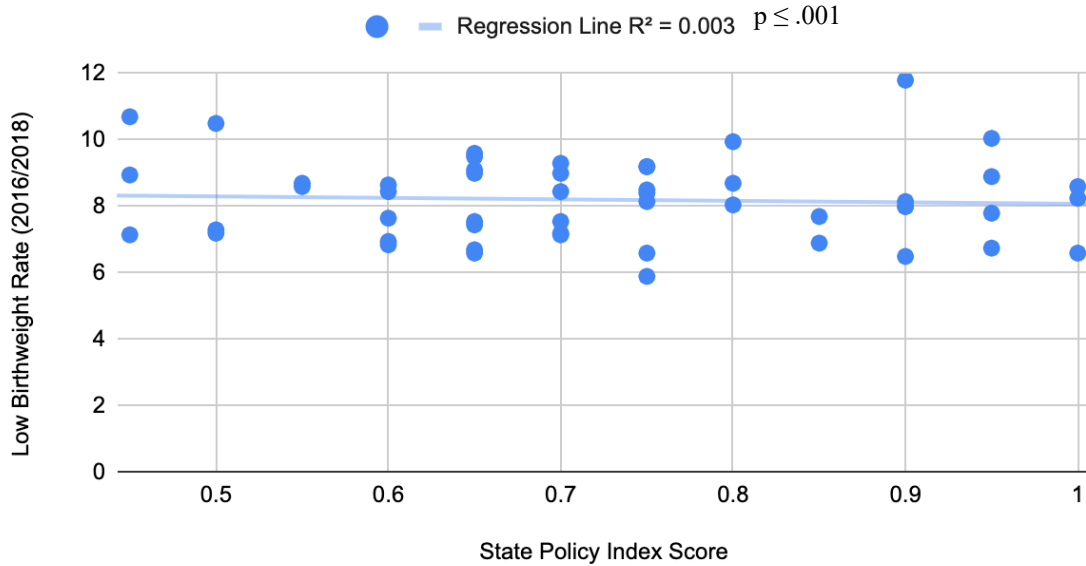


Figure 5: State Policy Index Score and Percentage of Families in Poverty

N=50 States

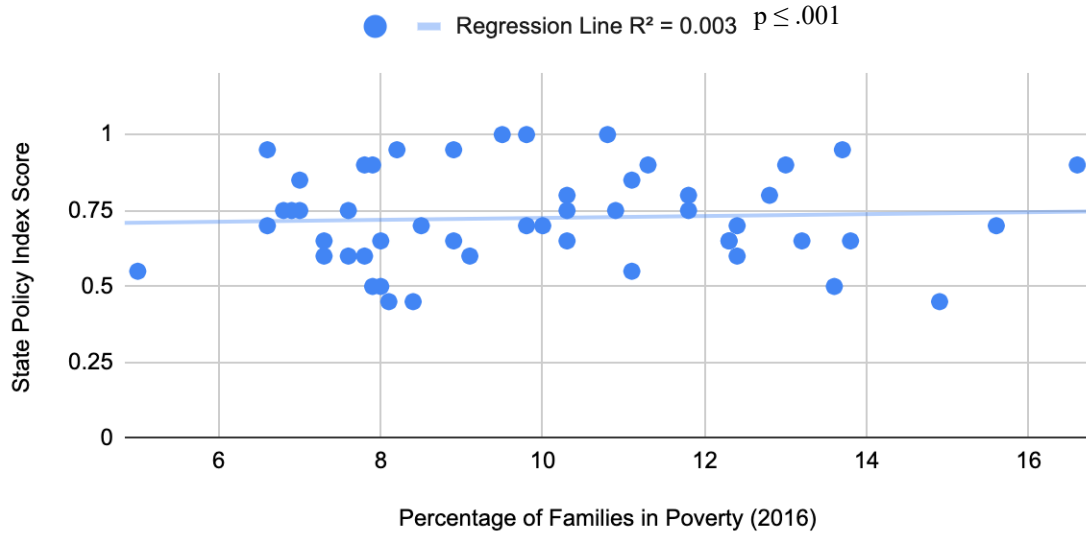
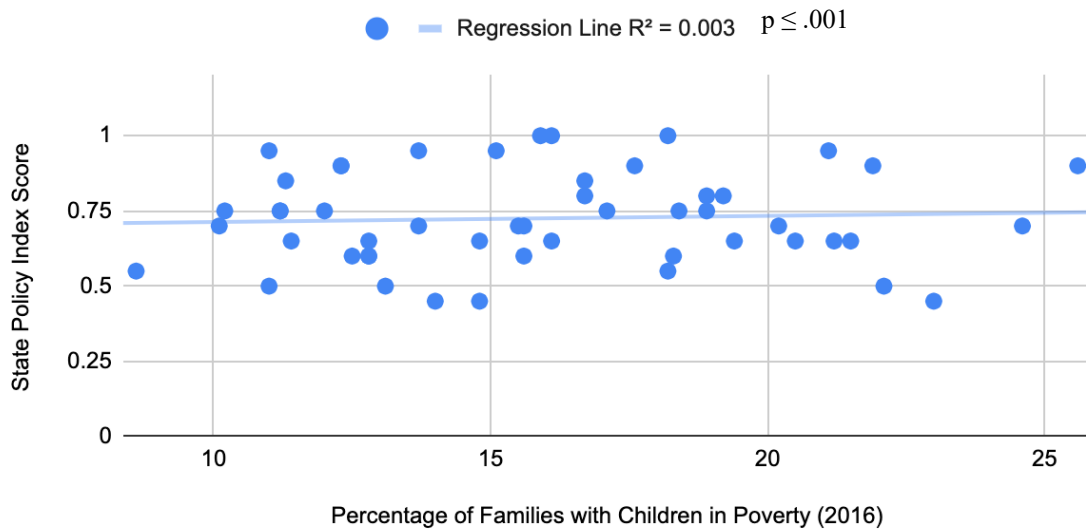


Figure 6: State Policy Index Score and Percentage of Families with Children in Poverty

N=50 States



F. Statistical Analysis and Partial Correlations of State Data

After these graphs were constructed and examined, the software SPSS was used in order to statistically evaluate the relationship between poverty, policy, and birth outcomes at the state level. This statistical analysis was performed in order to see the specific effect that each policy implementation had on the relationship between poverty and preterm birth rates/low birthweight rates. The bivariate correlations between poverty and birth outcomes - preterm birth rate and low birthweight rate - were found and then calculated when controlling for each perinatal service that was examined. All of the correlation coefficients were then put in a table in order to provide an easy point of comparison. Furthermore, the correlation between the rate of breastfeeding in each state and the rate of poverty was found. This correlation was examined because several of the healthcare services studied for this research become important after the birth of the baby, such as lactation consultants and breastfeeding pumps. After the bivariate correlation was found between poverty and breastfeeding rates, the partial correlations controlling for each healthcare service were also found.

Table 2 - Partial Correlations between Percentage of State Population Living in Poverty and Low Birthweight Rate, Preterm Birth Rate, and Breastfeeding Rate Controlling for Each Listed Perinatal Service

	Preterm Birth (2016/2017/2018)	Low-weight Birth (2016/2018)	Breastfeeding (Babies Born in 2016)
Correlation with Families in Poverty (2016)	0.726	0.717	-0.680
Partial Correlations Accounting for Policy Coverage:			
Home Visit Lactation Consultant	0.725	0.725	-0.684
OP Clinic Lactation Consultant	0.724	0.729	-0.680
Hospital Based Lactation Consultant	0.727	0.717	-0.683
Breastfeeding Education Services	0.725	0.713	-0.676
Manual Breast Pump	0.721	0.714	-0.674
Electric Breast Pump	0.700	0.696	-0.649
Postpartum Visit	/	/	/
Home Births	0.731	0.718	-0.677
Birth Centers	0.727	0.721	-0.682
Postpartum Home Visits	0.726	0.717	-0.685
Prenatal Home Visits	0.725	0.717	-0.682
Substance & Alcohol Abuse Treatment	0.724	0.714	-0.677
Case Management	0.747	0.741	-0.687

AN EXAMINATION OF [...] PERINATAL SERVICES AND BIRTH OUTCOMES

Infant Care Parenting Education Classes	0.724	0.712	-0.676
Childbirth Education Classes	0.726	0.717	-0.680
Amniocentesis	0.731	0.726	-0.670
Chorionic Villus Samping	0.736	0.730	-0.680
Genetic Counseling	0.726	0.723	-0.684
Ultrasound	/	/	/
Prenatal Vitamins	/	/	/
Presumptive Eligibility Adopted	0.736	0.718	-0.700
Policy Index Score	.733	.717	-.680
Medicaid Expansion Status	.705	.700	-.684

*Note: All $p \leq .001$

All fifty states and the District of Columbia covered prenatal vitamins, an ultrasound, and a postpartum visit to a physician under their Medicaid coverage, so no correlation could be calculated. As shown in the table, above, breast pumps, breastfeeding education classes, substance and alcohol abuse treatment, infant care and parenting education classes, and amniocentesis all helped to decrease the correlation between breastfeeding rates and poverty. This was determined by looking at the change in correlation when each policy/perinatal service was controlled for. Since the correlation between breastfeeding rate and poverty was negative, this means that the states with

AN EXAMINATION OF [...] PERINATAL SERVICES AND BIRTH OUTCOMES

lower rates of poverty had higher rates of breastfeeding in their populations. Providing services that aid in breastfeeding and that provide breastfeeding education helps to make the correlation less significant across states. All of these services would allow those in a lower socioeconomic class to have access to classes that educate them on practices that improve the health of their baby. For the correlation between low birthweight rate and poverty, breastfeeding education classes, infant care and parenting education classes, breast pumps, Medicaid expansion, and substance and alcohol abuse treatment all helped to decrease the correlation that was originally observed. These data suggest that having a Medicaid policy that supported pregnant women and that gave them resources to learn how to take care of themselves during pregnancy and their baby after birth helped to begin eliminating the health disparities seen between the poor and the affluent in birth outcomes. This outcome could be traced back to the idea that societal stress that comes from socioeconomic status influences health outcomes in the populations that make less money that was outlined in the weathering hypothesis. Allowing these women that used public health insurance such as Medicaid to have access to education classes made them feel more supported in the healthcare system and thus improved their physical health as a result. Lastly, the coverage of breast pumps (both manual and electric), clinic based lactation consultant, breastfeeding education services, prenatal home visits, infant care parenting education classes, Medicaid expansion and substance and alcohol abuse treatment was shown to decrease the magnitude of the positive correlation shown between preterm birth rates and poverty in states. This data point helped to highlight the idea that providing resources for those that struggle with addiction to get help changed the course of a person's or population's birth outcomes. Statistically, people in lower

socioeconomic classes were at a higher risk of developing dependence on alcohol or other substances, so covering resources that aid with addiction under Medicaid would have allowed mothers that were struggling to find support and help from healthcare professionals.

While the correlations may not have been altered dramatically by any one policy, the data were still promising for future development and statistical analysis. As discussed earlier, the layering of service coverage and Medicaid expansion could take several years to fully take effect, so much of the results have the potential to become clearer in the years to come. The data also revealed the importance of mothers feeling supported by a healthcare system and stressed the importance of both mental and physical well-being.

G. Mississippi County Data

With regards to the Mississippi county data that were collected, there was a positive correlation observed for the relationships between the percent of county families below the poverty line/percent of county families with children below the poverty line and preterm birth rate/low birthweight rate. In particular, there was a more positive correlation seen with the relationship between poverty and low birthweight rates within Mississippi counties. From there, each county was ranked based on their birth outcome rates and poverty rates and scatter plot graphs were again created. Similarly, a positive correlation was seen in all graphs comparing poverty and birth outcomes. The correlation between poverty (percentage of families and percentage of families with children) was found to be higher when examining low birthweight rates instead of preterm birth rates. The Mississippi Delta counties were denoted using a data point in the shape of a triangle.

AN EXAMINATION OF [...] PERINATAL SERVICES AND BIRTH OUTCOMES

From the county graphs of the state of Mississippi, it was determined that counties that had a higher percentage of families in poverty experienced worse birth outcomes than those counties that have a more affluent population. This trend seen within Mississippi counties followed the path that is seen across states in America.

Figure 7: Percent of County Families Below Poverty Line and Premature Birth Rate
N=82 MS Counties

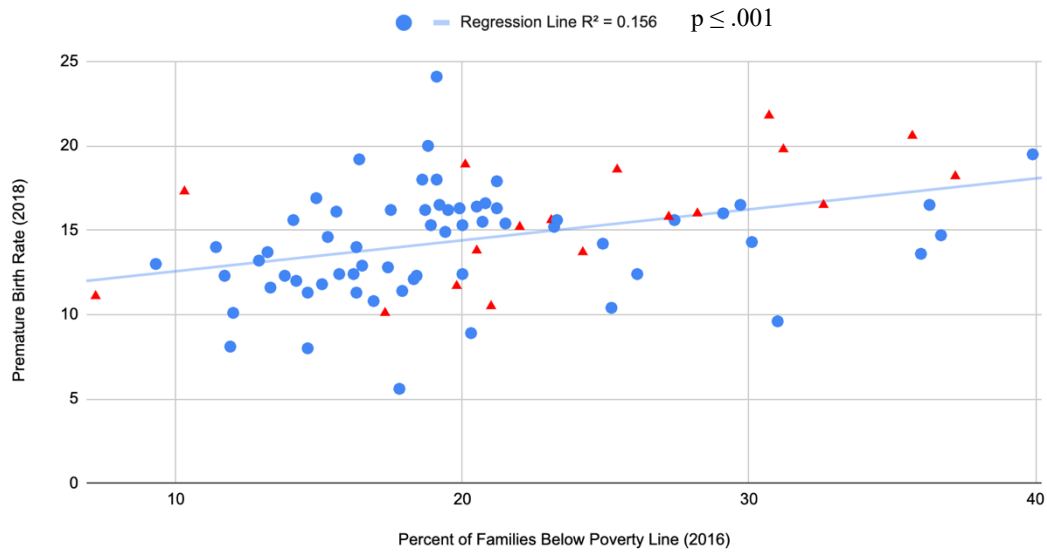


Figure 8: Percent of County Families Below Poverty Line and Low Birthweight Rate
N=82 MS Counties

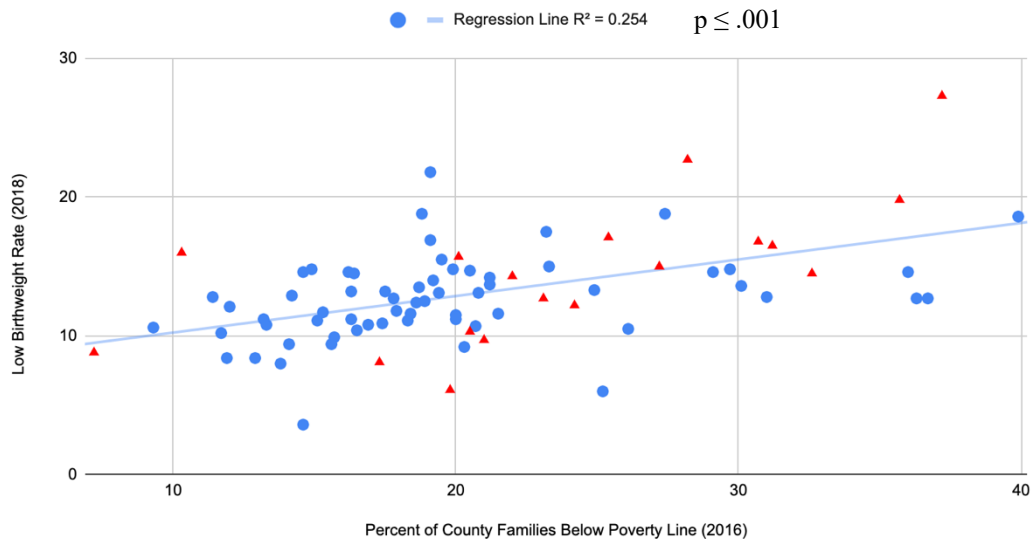


Figure 9: Percent of County Families with Children Below Poverty Line and Premature Birth Rate

N=82 MS Counties

$p \leq .001$

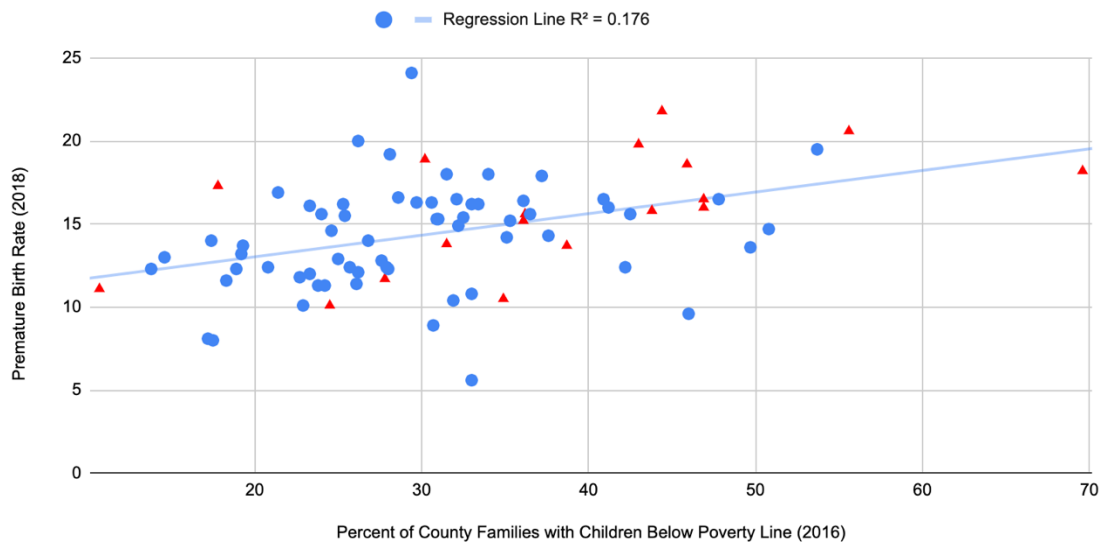
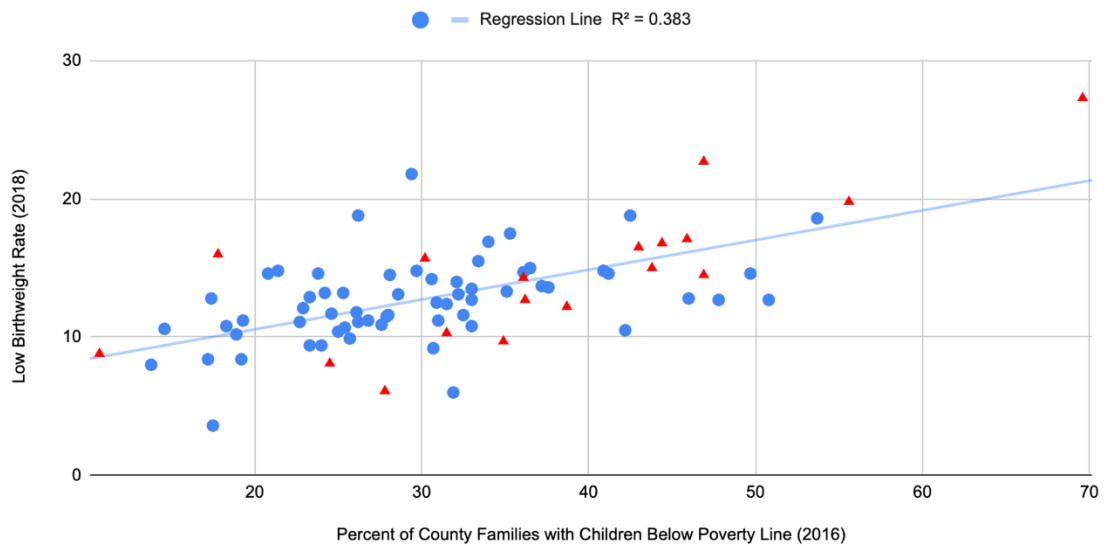


Figure 10: Percent of County Families with Children Below Poverty Line and Low Birthweight Rate

N=82 MS Counties

$p \leq .001$



AN EXAMINATION OF [...] PERINATAL SERVICES AND BIRTH OUTCOMES

Figure 11: Percent of County Families Below Poverty Line Rank and Premature Birth Rate Rank

N=82 MS Counties

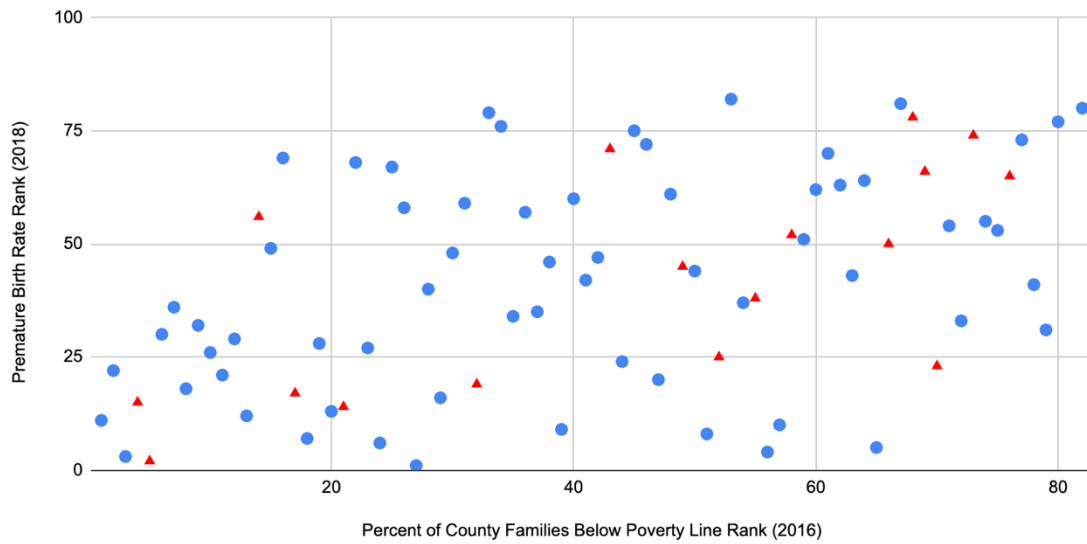


Figure 12: Percent of County Families Below Poverty Line Rank and Low Birthweight Rate Rank

N=82 MS Counties

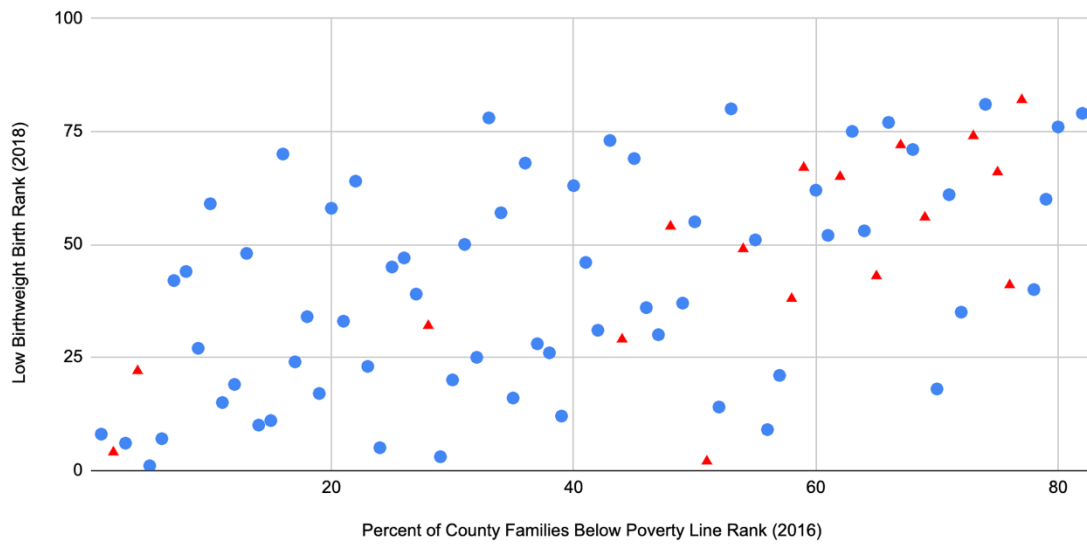


Figure 13: Percent of County Families with Children Below Poverty Line Rank and Premature Birth Rate Rank

N=82 MS Counties

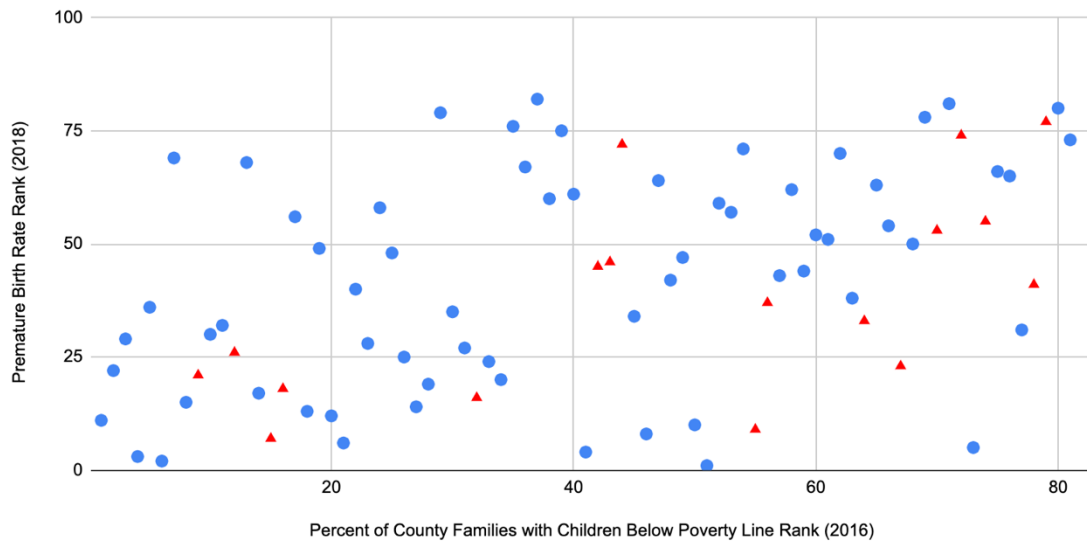
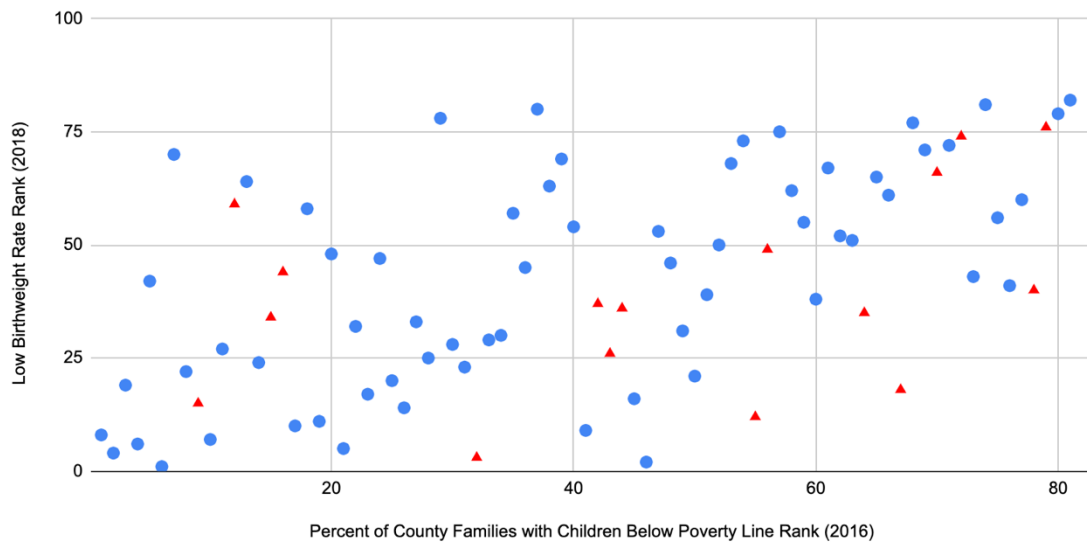


Figure 14: Percent of County Families with Children Below Poverty Line Rank and Low Birthweight Rate Rank

N=82 MS Counties



Discussion And Conclusions

In summary, the research and literature review in this thesis sought to examine the association, if any, of increasing perinatal service coverage under Medicaid across states to disrupt the relationship between statewide poverty and birth outcomes. This thesis focused mainly on state-level aggregate data and also worked to discuss county level data within the state of Mississippi in order to provide a more specific context and framework. The literature and data analysis portrayed the relationship seen between poverty and birth outcomes - as the percentage of people living below the poverty line in each state and county increased, so did the rate of premature and low birthweight births. The literature also hypothesized the idea that states that increased the number of people that were covered under Medicaid would experience lower rates of poor birth outcomes as compared to states that did not expand Medicaid past the federal requirement. The literature had not specifically examined perinatal services and their impact on birth outcomes under Medicaid across state or looked at the relationship between the number of perinatal services covered and birth outcomes within a state. The research found that there was a positive correlation between poverty and rates of poor birth outcomes at the state and county level, little correlation between state policy index and rates of poor birth outcomes, and little correlation between state policy index and percentage of families in poverty.

AN EXAMINATION OF [...] PERINATAL SERVICES AND BIRTH OUTCOMES

It was hypothesized that the difference in birth outcomes between states that have and have not expanded Medicaid will continue to increase as time passes. Due to the layering of policy within each state, meaning that states adopt the coverage of various policies at different times, the difference between birth outcomes has the potential to continue increasing. As discussed earlier, the mental effect of people feeling supported by the state healthcare system has also contributed to the difference seen between the two state groups. Since the Medicaid expansion was only put into effect in relatively recent years, the initial effects are still developing and being felt even by the states that expanded Medicaid past the required limit from the very start. The expansion status of states should affect birth outcomes because it increases the amount of people that are eligible for public health insurance, regardless of what specific services are offered.

As demonstrated by Watson, Kirby, Kelleher, and Bradley (1996), the states and counties that had higher percentages of people living in poverty experienced higher rates of preterm birth rates and low birthweight rates. This pattern remained true and present at both the micro and macro levels and did not vary even among states that offered more services within their Medicaid plan. The weathering hypothesis in relation to socioeconomic status as discussed by Geronimus also supported the data and helped to shed light on the effects of living in poverty on health outcomes. This idea could also provide some explanation as to why the data regarding the relationship between state policy index scores and poor birth outcomes did not follow the expected pattern. The weathering hypothesis indicates that the states with larger percentages of the population living below the poverty line would have higher rates of poor birth outcomes because these residents' bodies' would age faster than those not living in poverty. As a result of

this aging, they would experience overall worse health outcomes and, more specifically, worse birth outcomes. The relationship between poverty and birth outcomes shown in the data also supported the ideas of Copper et al. (1996). Furthermore, Antonisse et. al (2019) expressed the idea that Medicaid expansion would show many positive benefits to state populations. The data that were presented supported this idea by showing that states that did expand Medicaid had lower rates of premature births and low birthweight births.

One possible reason for the data not showing the hypothesized relationships based on their state policy index score could have been that oftentimes, the states that have the highest percentage of people in poverty did not have the resources to expand Medicaid further even though these states would have benefited most from extended coverage. On the other side, the states that did not have a high percentage of citizens that lived below the poverty line had more money that they were able to put towards public health care, and so their health outcomes further improved. Therefore, it was often hard to draw the connection definitively between poverty, policy, and health outcomes.

The trends of these graphs also highlighted the difficulty in tracing birth outcomes to policy coverage at the early stages of coverage implementation. In the coming years, it was predicted that the states that cover more services will have improving health outcomes while the states that do not cover as many services will see declining health outcomes. It can also be difficult to establish a connection because of the fact that even if states cover many perinatal services and therefore have a policy index score close to one, if they have not expanded Medicaid then a smaller percentage of their populations are able to receive those services.

AN EXAMINATION OF [...] PERINATAL SERVICES AND BIRTH OUTCOMES

A possible explanation for the lack of correlation seen between state policy index and birth outcomes had to do with the amount of time that it takes for policies to truly take effect within a state population. Furthermore, it was said that the healthcare system within the United States of America was so broken that healthcare was not, in fact, related to health outcomes. This idea was extremely startling finding and called for major healthcare system reform. This conclusion also filled in the gap in literature that had not previously addressed the relationship between the number of perinatal services covered and the rates of premature and low birthweight births. This research had worked to develop an understanding of the complicated relationship between birth outcomes, poverty, and perinatal healthcare services. In the future, more research on the relationship between healthcare coverage and birth outcomes is recommended in order to further explore the results of this research.

This research left room for future research into the effectiveness of Medicaid in helping pregnant women and more research into the effects of certain perinatal services on birth outcomes. This study was limited due to the fact that it was not able to perform in-depth analysis of every perinatal service covered due to the systematic and expansive nature of the research. This paper brings to light the fact that socioeconomic status was more predictive of birth outcomes than healthcare coverage opportunities. This data should be used to work towards policy change that helps a greater percent of the population. In terms of system structure, the results of this thesis also pointed to the need for structural reform.

In terms of the implications of this research, the results can be taken into the world of policy as support for the idea that our current healthcare system does not

AN EXAMINATION OF [...] PERINATAL SERVICES AND BIRTH OUTCOMES

effectively support the most vulnerable populations in our country. If a woman's poverty status is a better predictor of their birth outcomes than the amount of perinatal services that her state covers is, the system is not effectively protecting her and her pregnancy. The literature points to expanding Medicaid as a possible solution to improving birth outcomes, among other solutions

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