

# Can Doula Care Reduce Birth-Related Health Disparities?

Andrea Hall\*

November 12, 2024

## **Abstract**

Despite leading the world in medical spending and innovation, the United States continues to experience a crisis in birth-related health outcomes. Since high levels of spending and medical technology innovation have failed to improve outcomes like infant and maternal mortality, other approaches must be examined. In this paper, I study the effect of Medicaid coverage or reimbursement of doula services in the pregnancy, delivery, and perinatal process. Using variation in timing of coverage start dates and comparing non-covered Medicaid births to Medicaid births with the option of covered doula services, I find that Medicaid support for doula services increases the likelihood of a doula being present at delivery by up to 25%. Due to the small share of births ever involving a doula, this effect is small in absolute terms (.1% of all Medicaid births) but represents a meaningful percentage change. Medicaid births with doulas present are generally healthier than those without a doula present: these births are less likely to be pre-term, low birthweight, or to be C-sections after a failed labor attempt.

---

\*Assistant Professor, Department of Economics, Grinnell College [kellyand@grinnell.edu](mailto:kellyand@grinnell.edu)

# 1 Introduction

Maternal and infant mortality are high, and seem to be increasing, in the United States (Hill et al., 2023). When comparing birth-related outcomes, the US does quite poorly relative to other countries — and does significantly worse for people of color than for white people giving birth. For example, if the U.S. Maternal Mortality Rate (MMR) for Black mothers were separated from the rest of the population and compared to other countries, it would be in the top-100 countries in a ranking of MMRs — meaning that Black mothers in the US experience mortality rates (55.3 deaths per 100,000 live births) similar to women in Panama (50) and Mexico (59), lagging far behind even some of our geographic neighbors, like Cuba (39) or Puerto Rico (34); and astonishingly behind our economic peers, like the U.K. (10), France (8), or Germany (4) — despite the fact that Americans pay more for health care per capita than those in any other wealthy country (CIA, 2023; Gunja et al., 2023). Health professionals and policymakers alike have grappled with the question of how to reduce maternal and infant mortality in the US — particularly for those most vulnerable to maternal mortality, women of color. One potential strategy to improve these outcomes is to provide doula care to all pregnant women. Doulas are professionals who support people through major health transitions — for birth, doulas provide emotional, physical, and informational support and assist mothers with communication and advocacy with the broader birth health team. Doulas have helped women identify health warning signs, such as high blood pressure, that could be deadly if left unnoticed. Women who gave birth with doulas present were also less likely to deliver low-birthweight babies, experience birth complications, require a cesarean section delivery, or experience postpartum depression (Gruber et al., 2013; Falconi et al., 2022). Doulas can help inform mothers-to-be and can bridge linguistic and cultural gaps between mothers and their doctors.

Unfortunately, many of the women most at risk for birth-related complications lack information or resources to connect with doulas. This leaves them potentially at risk, unaware of their precarious state, and unable to effectively advocate for their health. To improve birth-related outcomes, some states have begun to reimburse doula fees for

Medicaid patients — such as Oregon in 2013, Minnesota in 2014, Florida in 2019, California in 2021, and Michigan in 2020, among others.<sup>1</sup> In this project, I aim to analyze national birth data to determine whether access to doulas has improved health outcomes for women and infants.

To answer this question, I will compare outcomes for births that were paid for with Medicaid across states that did and did not reimburse doula services. Additionally, I'll compare Medicaid-covered births to non-Medicaid covered births in reimbursing and non-reimbursing states over time, to see whether the doula reimbursement improved any existing income-gap in birth outcomes. Finally, I will assess whether doula reimbursement reduced infant and maternal morbidity gaps across racial and ethnic groups. For each of these analyses, I will use county of residence information and mother demographics, as well as birth-related health outcomes and method of payment, from the National Center of Health Statistics' Vital Statistics data. Early results, comparing Medicaid births across states over time, are somewhat less likely to experience severe maternal morbidity, very low birthweight and very low APGAR scores, and these births are less likely to result in hospital transfers or infant admittance to the NICU. To truly get at the heterogeneity of any effects — and to see how the broad policy change is actually impacting different groups of people — I will conduct subgroup analyses based on race/ethnicity, individual demographics, and local demographics. Due to the variety in start dates for these states' Medicaid coverage, I will follow current approaches to ensure the dynamic nature of this study is taken into consideration, likely using the Callaway-Sant'Anna approach of inverse probability weighting or doubly-robust estimands and Andrew Goodman-Bacon's estimator decomposition (Callaway and Sant'Anna, 2021; Goodman-Bacon, 2021). The rest of this paper is organized as follows: Section 2 briefly discusses economic work on birth-related health outcomes, defines doulas, and describes some detail about Medicaid coverage of doula care. Section 3 describes the data and empirical strategy used in these analyses. I discuss the results of the main specification, as well as potential predictor vari-

---

<sup>1</sup>At the time of this draft, 8 states and the District of Columbia have formally adopted Medicaid coverage of or reimbursement of birth doula care. Only Oregon, Minnesota, Florida, and New Jersey began to actually cover doula care prior to the end of observable data (Chen, 2022).

ables. Finally, I summarize my findings so far in Section 5 and provide a brief discussion of policy implications and next steps in Section 6.

## 2 Background

### 2.1 Birth-Related Health Outcomes & Disparities

While the U.S. is a leader in medical spending and innovation, it has failed to maintain improvement in birth-related health outcomes achieved by the 1990s and continues to lag behind European peers (Chen et al., 2014). In several states, maternal mortality has actually increased since the 1990s — in some cases, the number of maternal deaths per live birth have actually surpassed the same statistic from the 1960s in recent years.<sup>2</sup> While these statistics are poor across all dimensions (even the most privileged in the United States still face high risks in labor and delivery relative to similarly-privileged peers in other countries), they are especially strong for groups facing some sort of barrier to health care — whether that barrier comes through income, health insurance status, education, racial discrimination, language barriers, or even geographic location. Economists are not oblivious to these issues, and much work has been done to understand possible mechanisms behind these terrible outcomes. First, a branch of literature discuss the history of labor and delivery in the United States, documenting the transition from home births to hospital births and genuinely impressive improvements in infant and maternal mortality over time (Troesken, 2008; Moehling and Thomasson, 2014; Anderson et al., 2022; Hollingsworth et al., 2022; Jacks et al., 2021; Jayachandran et al., 2009; Cutler et al., 2012; Collins and Thomasson, 2004; Haines, 2011; Anderson et al., 2020). Sanitation and medical innovation are credited as contributors to the historic improvements in the early-to-mid 1900s (Moehling and Thomasson, 2014; Clay et al., 2023, 2024) and many studies have examined different potential solutions to poor health outcomes in more modern times (Altındağ et al., 2024; Geruso and Spears, 2018b,a).

---

<sup>2</sup>Using maternal death data from Iowa and Pennsylvania, there is a clear increase in maternal deaths per total live births in both states — the statistic for 2021 in Iowa was more than double Iowa’s 1960 stat (20.38 maternal deaths per 10,000 live births in 1960 compared to 48.93 per 10,000 live births in 2021).

Since these health disparities are most pronounced along racial and ethnic lines — and given the U.S.’s history of systemic racism in medicine, particularly toward Black Americans — bias in healthcare is considered by many to be a likely contributor to the problem. Work has been done to document the existence and consequences of bias in medicine and to assess approaches to reduce bias in health systems, finding that reducing provider bias can improve patient experiences and outcomes (Eli et al., 2019; Wagner et al., 2023; Dominguez et al., 2008; Carty et al., 2011). Even in cases where bias does not seem to be driven specifically by racist beliefs (or along racial lines), evidence consistently shows that medical actors behave differently for different patients for reasons *outside* of actual medical differences, suggesting medical bias may have a firm foothold in the current system (Currie et al., 1995; Johnson and Rehavi, 2016; Currie et al., 2024; Eli et al., 2019; Yearby, 2021).

Finally, patients are aware — to some degree — of the way their personal presentational intersections may negatively impact their health outcomes. Black and Indigenous birthing people have commented on their likelihood of and experiences with race-based medical mistreatment (Nuru-Jeter et al., 2009; Nguyen et al., 2023; Thackrah et al., 2021). Patients aware of racial or other biases in medicine may choose not to trust the advice of their providers — as can be seen even in long-term, intergenerational studies evaluating the effects of the Tuskegee Study’s abhorrent dishonesty (Shavers et al., 2000; Gamble, 2016; Alsan and Wanamaker, 2018). Birth workers have expressed outrage and demanded change within their profession to improve these outcomes and reduce the role of racism and bias in their patients’ experience — often calling for improvement in culturally-relevant and trauma-informed care (Thackrah et al., 2021; Louise-Jacques, 2024).

## 2.2 Doulas

In order to understand what sort of effects we might reasonably expect from doula coverage, it is crucial to understand what a doula is — and, just as importantly — what a doula is not. Doulas are trained and (typically) certified care providers who assist

and support people through a wide variety of health transitions, from fertility through delivery and postpartum all the way through later-in-life health crises and end-of-life. Doulas are increasingly supporting a diverse range of clients: some specialize in assisting Black or indigenous people, some specialize in gender diversity and gender transition processes, and some focus on high-risk pregnancies and the provision of trauma-informed care. In any setting, doulas provide physical, emotional, and informational support to their clients. Clients of doulas benefit from the wealth of knowledge and experience the doula has with the relevant transition — which, in many cases, the client is experiencing for the first time. While the breadth of available doula services is wide, the most common type of doula care is connected to pregnancy and delivery. In fact, unless clarified to be a different type of doula, the word ‘doula’ consistently evokes an image of a labor and delivery supporter. Through the rest of this paper, ‘doula’ will be used to describe pregnancy-related doulas — most often, the doulas present in the labor and delivery room.

As an important aside, the term ‘doula’ deserves some awareness. Doula, pronounced ‘doo-luh’, comes from an ancient Greek word *doulē*, meaning female servant (Center, 2023). This language choice is debated among actual doula practitioners; some find its continued use to be perpetuation of racist stereotypes (especially since many doulas are people of color) and forces a gendered perspective of this work, while others find it empowering to reclaim the word (Yiu, 2024; Salinas et al., 2022). At the time of this draft, a consensus has not been reached, and ‘doula’ remains the most commonly-used term for the type of labor and delivery worker being referenced in this project. As such, I will continue to use ‘doula’ throughout this paper, but will update terminology as our language evolves.

Doulas are trained, experienced, and (typically) certified providers, but there is currently no uniform training process or certifying/licensing board in the United States. This lack of a uniform process makes it difficult to understand exactly how many doulas are practicing in the U.S. at any given time, though estimates suggest approximately 9,000 doulas practiced in recent years (Reed and Goldman, 2023). At the same time, there

have been roughly 3.6 million births per year — doulas only cover a very small share of births in this country. Doulas differ from other types of labor and delivery workers in many ways: training is shorter, certification is less formal, and licensing is inconsistent for doulas (dou, 2023; Guenther et al., 2022). In fact, there is nothing to stop a person from claiming doula status in another person’s labor and delivery process — though reimbursement for doula services does typically require some form of certification.<sup>3</sup> Doulas are not able to perform medical tasks, unlike certified nurse midwives (or certified nurses, PAs, or MDs). Doulas have, in general, more training and experience in labor and delivery room settings than their clients (and are not personally experiencing the difficulty of childbirth) who are able to contextualize the birthing person’s experience and assist the client in self-advocacy. Doulas may also help birthing people stick to their intended birth plan — especially in marginal cases for possible C-sections.

While evidence is somewhat limited, doulas seem to improve the birthing experience for their clients: when randomly assigned to have a doula, birthing people experienced shorter labor, increased likelihood of spontaneous vaginal deliveries, and decreased use of pain medication and Cesarean sections (Bohren and Cuthbert, 2017). Additionally, babies born with doula support were less likely to have low APGAR scores and birthing people were less likely to experience postpartum depression (Bohren and Cuthbert, 2017; Dekker et al., 2013).

## 2.3 Medicaid Coverage of Doulas

Despite doulas being a potential channel through which birth outcomes for the most disadvantaged could be improved, doula services are not always covered by private or public insurance, making them potentially inaccessible to those who need their services the most. In an effort to remedy this issue, several states and local groups have worked toward providing funding for low-income birthing people — and in some cases, low-income birthing people of particular communities, such as a particular race or ethnicity.

---

<sup>3</sup>In dou (2023)’s article, they state that a family member could be listed as a doula, even without any doula training. In practice, this type of care would not typically be eligible for financial support from private or public insurance.

Medicaid policy is determined at the state level, so there is variety in access to doula care for Medicaid-covered births by state and time. The first states to pass legislation providing doula coverage to Medicaid patients did so beginning in 2011 (Oregon), though the first year of actual benefits began in 2014 (Minnesota and Oregon). Since then, over half of all states have some form of a doula effort in existence (?).

Medicaid coverage or reimbursement of doula care does, theoretically, increase access to doula services for low-income birthing people, but there are a few key problems that remain unsolved. First, coverage of doula services does not necessarily mean doulas will be available in a given location. Even if services are covered, access to doulas would remain an issue if there are no practicing (or properly certified) doulas in the area — or if the demand for doula services far exceeds the local supply of these workers. Second, coverage of doula services does not guarantee a good match between client and doula. For a client to receive the maximum benefit of working with a doula, they would need to be matched to someone knowledgeable, respectful and aware of their potential concerns, and someone with whom they feel comfortable. Everyone has different needs and preferences, so poor matches are likely to exist between doulas and clients. If these poor matches are common, we might expect the benefits of doulas to be quite small. Third, even when there are sufficient doulas in the local market that good matches can be made, the presence of a doula throughout the delivery process cannot fully erase the negative outcomes and experience folks face — especially if the systemic nature of racism in healthcare, for example, has already had a compromising effect on their health. In other words, doulas may be able to help, but may not be able to ‘move the needle’ tremendously on the extreme outcomes. Finally, even in cases with reasonable availability of well-matched doulas, and in cases in which a client could receive immense benefit from a doula’s care, the coverage and reimbursement policies themselves can be limited in both the dollar amount and the timing of benefits. For example, Oregon’s initial reimbursement for doula services was only \$75, which was certainly not enough. Similarly, any care that requires an up-front payment from the client to eventually be reimbursed by Medicaid could present a barrier to access for these low-income patients.



In an attempt to address some of the concerns above, I am compiling information about local doula supply. Some states have publicly available doula registries, making data collection relatively straightforward (although it is often impossible to obtain retroactive data). Other states have no formal list, and all states have a variety of certification processes for potential doulas that are acceptable. The largest doula certification board is DONA International, but states have not generally required certification to come through one specific board — so even scraping DONA’s list over time could lead to really inconclusive and potentially biased understandings of the doula labor force. I am also generating a dataset of the different reimbursement/coverage rates, relative to average doula costs, for each covering state. I will implement both of these additional data sources in later versions of this project.

### **3 Empirical Approach**

This section describes the data and empirical approach I use to estimate the causal effects of Medicaid coverage of birth doula care.

#### **3.1 Data**

To analyze the effect of doula care on birth-related health outcomes, I am using the National Center for Health Statistics’ Vital Statistics data from 2012 – 2022. These data contain vast information on demographic and birth-related health outcomes for both the person giving birth and the infant born. They include geographic indicators (county of residence), prior pregnancy outcomes (number of prior births for which a child is still alive or is no longer living, prior terminations), maternal health risk factors (such as hypertension or diabetes), maternal behaviors (such as prenatal care visits and counts of cigarettes smoked during each trimester), birth-related health outcomes for the mother (including unplanned hysterectomy, transfer to the ICU, or blood transfusions), demographic data (mother’s age, education, race and ethnicity), and the source of payment for the birth (public insurance, private insurance, other). Infant health outcomes are also

included, ranging from the birth weight to the presence of congenital complications or defects to an indication for whether the infant was transferred to the NICU and whether the infant is alive at time of the birth record being taken.

To define treatment states and their start-of-treatment time, I use information regarding Medicaid changes and include a map from Chen’s work on the subject (Chen, 2022), which I verified by reading state legislation files regarding Medicaid coverages. Several states did implement changes to their Medicaid programs directly, while others have had non-Medicaid interventions (like doula pilot programs) implemented. I use the month of benefits beginning as the first potential month of treatment. Since many people interact with a doula only in the labor and delivery room (and not in prenatal experiences), it is reasonable to test for effects starting in the month in which doula care began to be reimbursed. However, we may not expect all eligible birthing people to be immediately aware of their eligibility for doula services, or we may expect any impacts of doulas to build over time (as people are able to get to know a doula prior to labor) — so evaluating dynamic treatment effects will be critical. Medicaid-paid births in states that do not (or do not yet) cover doula services will be considered ‘untreated.’ I consider measured effects to be an intent-to-treat effect, which is likely to be an underestimate of true treatment effects of doula care in the labor and delivery room. Surely not all Medicaid-eligible patients in treated states are working with birth doulas. While I do have a variable that measures doula presence, I do not aim to establish a causal relationship between doula care and outcomes based on those who select doula services compared to those who do not. Instead, I measure the effect of a change in Medicaid coverage which supports doula care on the presence of doulas in the labor and delivery room. Doula presence — even after Medicaid coverage — is quite rare. Effects, therefore, are likely to be small and difficult to distinguish from zero at the population-level. Heterogeneity analyses will be critical and will be part of my next steps on this project, as will further study into the variables that predict doula takeup among Medicaid birthing people.

### 3.2 Identification Strategy: Event Study

I use a dynamic difference-in-differences approach to estimate the causal effects of Medicaid coverage of doula care. This approach exploits cross-state variation over time and controls for aggregate time shocks, as well as fixed differences across states over time. In order for this approach to be valid, it must be true that changes in birth-related health outcomes for comparison states provide a good counterfactual for the changes that would have been observed for treated states, if Medicaid coverage had remained unchanged. My approach to estimating the effects of Medicaid coverage of doulas on birth-related health outcomes corresponds to the following equation:

$$y_{ismy} = \sum_{k=-12}^{12} \theta_k Doula_{s,t-k} + \alpha_s + \alpha_m + \alpha_y + \epsilon_{ismy} \quad (1)$$

where  $y_{ismy}$  is the outcome of interest for a birth event  $i$  in state  $s$ , month  $m$ , year  $y$ ;  $Doula_{s,t-k}$  is an indicator the number of months prior to birth event for which doula care was reimbursed in state  $s$ ;  $\alpha_s$  are state fixed effects;  $\alpha_m$  are month fixed effects; and  $\alpha_y$  are birth-year fixed effects.<sup>4</sup> All reported standard-error estimates are clustered on the state to account for correlation within states over time.<sup>5</sup>

I favor a method that uses individual birth outcomes for a variety of reasons — most importantly to allow for later-observations. The population data at the county-level that I typically use for reliable demographic data, SEER’s population statistics, are not available through 2022 at the time of this draft. Thus, any calculation based on county-level birth rates would necessarily rely on strong population assumptions. For event-study figures, I restrict the dataset to only include birth events for which Medicaid was the primary payer.<sup>6</sup> The running variable in the event study figures is the number of months

---

<sup>4</sup>I have also used month of conception, calculated using gestational age at birth, to assign the number of months covered by doula care — results are quite similar and are available on request.

<sup>5</sup>I also drop any state that had a documented doula program that was not conducted through that state’s Medicaid (or did not include all Medicaid patients). However, due to a variety of undocumented (or unpublicized) efforts to improve birth-related outcomes in smaller localities, it is possible some of my ‘comparison’ observations are, in fact, treated.

<sup>6</sup>Results including all births in the country can be generated, but require an intense amount of computing power and a lengthy time to process the data. Additionally, it is not clear that the non-Medicaid births, even within the same state, would provide a good counterfactual for Medicaid births, given the intensity of health disparities along income lines.

between the birth event and the state’s doula efforts began (formal start dates for doula reimbursement or coverage) — an observation in the “3” category represents the effect of the state’s policy on the given outcome, when the policy came into action 3 months prior to the birth event. Similarly, an observation in the “-12” category represents the effect of the state’s policy on the given outcome when the policy began 12 or more months *after* the birth event. All estimated effects are referenced to births occurring one month prior to policy implementation, relative to Medicaid births in comparison states. If the outcome for Medicaid birthing people remained on its trajectory (relative to the outcome for Medicaid birthing people in other states) prior to state policy implementation, coefficients for the months prior to zero should be statistically indistinguishable from zero — which would support (though not perfectly ‘prove’) the parallel trends assumption. Then, any coefficients that are statistically different from zero in the post period should represent the causal effect of having doula care covered/reimbursed by Medicaid for the relative month’s length (i.e. 3 months for those in “3”) of the pregnancy. A vertical dashed line is placed just before the first month of the policy taking effect, and another is placed at month 9. If effects are truly coming from the policy, the first month in which an effect could be detected would be month zero; if effects are coming from the policy but require the doula be available for most or all of a pregnancy, they should only be detected starting around month 9. Average post-period effects are shown in Table 4.

## 4 Results

In each set of results, the timing of doula care reimbursement is used as the source of exogenous variation in doula access. For the results to be valid, it must be the case that Medicaid-covered births in states that do not cover doula services must provide a good counterfactual for Medicaid-covered births in doula-covering states. The dynamic nature of the results (in all figures) captures whether the treatment effects differ by how much of a pregnancy occurred with Medicaid reimbursement for doula care as an option. Point estimates in the “3” slot represent the difference in outcomes for Medicaid births

occurring 3 months after the state of residence moved to cover doula care, relative to other births; all compared to the omitted category of Medicaid-covered births that occurred one month prior to doula coverage. If simply having the option of the presence of a doula in labor is the driver of effects, we may anticipate all effects to be stagnant and consistent across all treated pregnancies; if having access to doulas prior to delivery matters, we might expect effects to increase with months of pregnancy occurring during coverage.

For today's results, the overall data set is restricted to *only* births covered by Medicaid. All non-Medicaid births in all states are dropped from these analyses, generating a comparison across states and time among Medicaid-covered birth events. Additionally, any state engaging in a doula initiative through a channel other than Medicaid is dropped from the analyses. This is a logical place to start, since Medicaid-covered births are more likely to be similar to other Medicaid-covered births than they are to the births of same-state births to privately-insured (and often wealthier) families. In this case, 0 represents births occurring the same month in which the birthing person's state of residence began reimbursing doula care; 12+ represents births occurring 12 or more months after the state of residence began reimbursing doula care.

Visual results using the dynamic specification can be found in Figures 2 – 3, and the corresponding table of average difference-in-differences effects can be found in Table 4. The presented results are robust to the inclusion of demographic variables (mother's age, marital status, paternity acknowledgement, child's sex) and results for only first-time mothers are similar for the full population. Generally speaking, results suggest improved health outcomes after Medicaid coverage of doula services, despite the fact that the doula take-up is low.

## 4.1 Future Directions of Subanalytic Study

In addition to studying relevant health outcomes across states (but restricting to Medicaid-covered births), I have begun work running similar analyses comparing the following:

- Restricting only to states that eventually reimburse doula care; treated are Medicaid-

covered births, comparison are non-Medicaid covered births

- The outcome gap between black and white birthing people, within covering states; treated are Medicaid-covered births to black people, comparison are Medicaid-covered births to white people
- The outcome gap between Medicaid and non-Medicaid people, in all states

Each of these subanalyses could shed light on how the option of doula care impacts existing inequities: looking within treated states, we can eliminate major cross-state differences (i.e. if only states with bad maternal outcomes are providing reimbursements for doulas, it may be more appropriate to focus on states that do reimburse and use timing and insurance coverage, or timing and race, to differentiate treatment status). Additionally, I will conduct further robustness tests to the inclusion of states with other doula programs and will estimate effects for first-time mothers of different race and ethnicity subgroups. Finally, I will re-identify race and ethnicity groups into BIPOC or white, in hopes of better catching folks whose definition of race may have changed with reporting form changes.

## 5 Conclusion

The current iteration of this paper shows that Medicaid coverage of doula care increases the presence of doulas among Medicaid-covered births shortly after the policy takes effect, which fade away with time. At its peak, the increase in doula presence for all birthing people may be as high as 30%, though estimates are noisy and fade quickly. Effects seem strongest for Asian American/Pacific Islander birthing people, with an average post-period increase of approximately 12%, but given the generally small use of doulas in delivery, this size of an effect is unlikely to have population-level impacts on observable infant and maternal health outcomes. That said, Medicaid births that have a doula present are generally healthier — with less Cesarean sections, less likelihood of early-term, low- or very low-birthweights, and higher likelihood of zero reported maternal morbidity indicators. Given the relatively low costs of supporting doula services, this

work suggests that funding for certified doulas *could* improve outcomes while also saving states money.

## 6 Discussion

While this study certainly has room for expansions, it is clear that in providing coverage for doula services, some birthing people take up those services, and those that do seem to experience better birth-related health outcomes. Future work within this subject must better understand how the level or type of coverage/reimbursement structure matters, whether some groups or outcomes are more or less impacted by doula coverage, how supply of doulas changes in response to Medicaid reimbursement, and whether — for those truly most likely to be impacted by doula services — birth outcomes are changing in meaningful ways.

This project is being conducted alongside other work looking within states that begin to cover doulas — using the variation in supply of doulas across counties. Additionally, this project will add analyses comparing within-state racial gaps in health outcomes as well as gaps in Medicaid-covered births relative to privately insured births.

Given the absolute tragedy that families and society experience with extreme poor birth-related outcomes (such as maternal or infant mortality), it is of the utmost importance for policy-makers to understand how to help create institutions that work toward reducing these terrible outcomes rather than increasing them. As labor and delivery units continue to close and reproductive health care continues to face legal battles — leading to physicians being unwilling or unable to provide at least some of the care that could prevent these deaths — the importance of addressing this crisis will only continue to rise.

Providing culturally-sensitive, trauma-informed care could be the difference between life and death for someone facing the physical, emotional, and financial journey of a pregnancy and delivery. Doulas could be an answer to this problem — and the costs of training and funding doulas is relatively small compared to other potential interventions.

# References

- (2023, April). Doula vs. midwife: What’s the difference?
- Alsan, M. and M. Wanamaker (2018). Tuskegee and the health of black men. *The quarterly journal of economics* 133(1), 407–455.
- Altındağ, O., J. Greve, and E. Tekin (2024). Public health policy at scale: impact of a government-sponsored information campaign on infant mortality in denmark. *Review of Economics and Statistics* 106(3), 882–893.
- Anderson, D. M., K. K. Charles, M. McKelligott, and D. I. Rees (2022). Estimating the effects of milk inspections on infant and child mortality, 1880–1910. In *AEA Papers and Proceedings*, Volume 112, pp. 188–192. American Economic Association 2014 Broadway, Suite 305, Nashville, TN 37203.
- Anderson, D. M., K. K. Charles, and D. I. Rees (2020, October). Imposing policy on reluctant actors: The hospital desegregation campaign and black postneonatal mortality in the deep south. Working Paper 27970, National Bureau of Economic Research.
- Bohren, MA, H. G. S. C. F. R. and A. Cuthbert (2017). Continuous support for women during childbirth. *Cochrane Database of Systematic Reviews* (7).
- Callaway, B. and P. H. Sant’Anna (2021). Difference-in-differences with multiple time periods. *Journal of Econometrics* 225(2), 200–230. Themed Issue: Treatment Effect 1.
- Carty, D. C., D. J. Kruger, T. M. Turner, B. Campbell, E. H. DeLoney, and E. Y. Lewis (2011). Racism, health status, and birth outcomes: results of a participatory community-based intervention and health survey. *Journal of Urban Health* 88, 84–97.
- Center, M. (2023, March). From ancient roots to modern revolution: The dynamic history of doula care.
- Chen, A. (2022, November). Current state of doula medicaid implementation efforts in november 2022. *National Health Law Program*.



- Chen, A., E. Oster, and H. Williams (2014, September). Why is infant mortality higher in the us than in europe? Working Paper 20525, National Bureau of Economic Research.
- CIA (2023). Maternal mortality ratio - country comparison.
- Clay, K., A. Hollingsworth, and E. R. Severnini (2023, June). The impact of lead exposure on fertility, infant mortality, and infant birth outcomes. Working Paper 31379, National Bureau of Economic Research.
- Clay, K., J. Lewis, and E. Severnini (2024). Canary in a coal mine: infant mortality and tradeoffs associated with mid-20th century air pollution. *Review of Economics and Statistics* 106(3), 698–711.
- Collins, W. J. and M. A. Thomasson (2004). The declining contribution of socioeconomic disparities to the racial gap in infant mortality rates, 1920-1970. *Southern Economic Journal* 70(4), 746–776.
- Currie, J., J. Gruber, and M. Fischer (1995). Physician payments and infant health: Effects of increases in medicaid reimbursements. *American Economic Review* 85(2), 106–111.
- Currie, J., W. B. MacLeod, and K. Musen (2024, August). First do no harm? doctor decision making and patient outcomes. Working Paper 32788, National Bureau of Economic Research.
- Cutler, D. M., E. Meara, and S. Richards-Shubik (2012). Induced innovation and social inequality: evidence from infant medical care. *Journal of Human Resources* 47(2), 456–492.
- Dekker, R., S. Ailshire, and I. Ali (2013, March). Evidence on: Doula. *Evidence Based Birth*.
- Dominguez, T. P., C. Dunkel-Schetter, L. M. Glynn, C. Hobel, and C. A. Sandman (2008). Racial differences in birth outcomes: the role of general, pregnancy, and racism stress. *Health psychology* 27(2), 194.

- Eli, S., T. D. Logan, and B. Miloucheva (2019). Physician bias and racial disparities in health: Evidence from veterans’ pensions. Technical report, National Bureau of Economic Research.
- Falconi, A. M., S. G. Bromfield, T. Tang, D. Malloy, D. Blanco, R. S. Disciglio, and R. W. Chi (2022). Doula care across the maternity care continuum and impact on maternal health: Evaluation of doula programs across three states using propensity score matching. *EClinicalMedicine* 50.
- Gamble, V. N. (2016). Under the shadow of tuskegee: African americans and health care. *Health Psychology*, 434–441.
- Geruso, M. and D. Spears (2018a, July). Heat, humidity, and infant mortality in the developing world. Working Paper 24870, National Bureau of Economic Research.
- Geruso, M. and D. Spears (2018b). Neighborhood sanitation and infant mortality. *American Economic Journal: Applied Economics* 10(2), 125–162.
- Goodman-Bacon, A. (2021). Difference-in-differences with variation in treatment timing. *Journal of Econometrics* 225(2), 254–277.
- Gruber, K. J., S. H. Cupito, and C. F. Dobson (2013). Impact of doulas on healthy birth outcomes. *The Journal of perinatal education* 22(1), 49–58.
- Guenther, G., P. Kett, S. M. Skillman, and B. K. Frogner (2022, August). The birth doula workforce in the u.s.
- Gunja, M. Z., E. D. Gumas, and R. D. W. II (2023, January). U.s. health care from a global perspective, 2022: Accelerating spending, worsening outcomes.
- Haines, M. R. (2011). Inequality and infant and childhood mortality in the united states in the twentieth century. *Explorations in Economic History* 48(3), 418–428.
- Hill, L., S. Artiga, and U. Ranji (2023, Jun). Racial disparities in maternal and infant health: Current status and efforts to address them.

- Hollingsworth, A., K. Karbownik, M. A. Thomasson, and A. Wray (2022, November). The gift of a lifetime: The hospital, modern medicine, and mortality. Working Paper 30663, National Bureau of Economic Research.
- Jacks, D. S., K. Pendakur, and H. Shigeoka (2021). Infant mortality and the repeal of federal prohibition. *The Economic Journal* 131(639), 2955–2983.
- Jayachandran, S., A. Lleras-Muney, and K. V. Smith (2009, June). Modern medicine and the 20th century decline in mortality: Evidence on the impact of sulfa drugs. Working Paper 15089, National Bureau of Economic Research.
- Johnson, E. M. and M. M. Rehavi (2016). Physicians treating physicians: Information and incentives in childbirth. *American Economic Journal: Economic Policy* 8(1), 115–141.
- Louise-Jacques, A. (2024, January). What i’d like everyone to know about racism in pregnancy care. *Expert View*.
- Moehling, C. M. and M. A. Thomasson (2014). Saving babies: the impact of public education programs on infant mortality. *Demography* 51(2), 367–386.
- Nguyen, T. T., S. Criss, M. Kim, M. M. De La Cruz, N. Thai, J. S. Merchant, Y. Hswen, A. M. Allen, G. C. Gee, and Q. C. Nguyen (2023). Racism during pregnancy and birthing: experiences from asian and pacific islander, black, latina, and middle eastern women. *Journal of Racial and Ethnic Health Disparities* 10(6), 3007–3017.
- Nuru-Jeter, A., T. P. Dominguez, W. P. Hammond, J. Leu, M. Skaff, S. Egerter, C. P. Jones, and P. Braveman (2009). “it’s the skin you’re in”: African-american women talk about their experiences of racism. an exploratory study to develop measures of racism for birth outcome studies. *Maternal and child health journal* 13, 29–39.
- Reed, T. and M. Goldman (2023, September). Interest in doula care grows amid maternal health crisis.

- Salinas, J. L., M. Salinas, and M. Kahn (2022). Doula, racism, and whiteness: How birth support workers process advocacy towards women of color. *Societies* 12(1).
- Shavers, V. L., C. F. Lynch, and L. F. Burmeister (2000). Knowledge of the tuskegee study and its impact on the willingness to participate in medical research studies. *Journal of the National Medical Association* 92(12), 563.
- Thackrah, R. D., J. Wood, and S. C. Thompson (2021). Longitudinal follow up of early career midwives: insights related to racism show the need for increased commitment to cultural safety in aboriginal maternity care. *International Journal of Environmental Research and Public Health* 18(3), 1276.
- Troesken, W. (2008). Lead water pipes and infant mortality at the turn of the twentieth century. *Journal of Human Resources* 43(3), 553–575.
- Wagner, Z., C. Moucheraud, M. Shah, A. Wollum, W. H. Friedman, and W. H. Dow (2023). Reducing bias among health care providers: Experimental evidence from tanzania, burkina faso, and pakistan. Technical report, National Bureau of Economic Research.
- Yearby, R. (2021). Race based medicine, colorblind disease: how racism in medicine harms us all. *The American Journal of Bioethics* 21(2), 19–27.
- Yiu, M. (2024, March). Nhlp’s framing and language in the doula medicaid project.

# Tables

Table 1  
Summary Statistics: Medicaid Births, Before Doula Reimbursement

	Black Medicaid		White Medicaid		Difference	
	Mean	sd	Mean	sd	Difference	t-stat
Birth Attendee - Non-Midwife	0.008	0.088	0.007	0.086	0.000	(0.379)
Full-Term Delivery	0.266	0.442	0.316	0.465	0.058***	(79.594)
Healthy Birth Weight	0.856	0.351	0.918	0.275	0.053***	(113.056)
Vaginal Delivery	0.656	0.475	0.690	0.462	0.029***	(38.693)
Labor Induced	0.254	0.435	0.269	0.444	0.019***	(29.685)
Birth Complications	0.369	0.483	0.338	0.473	-0.027***	(-35.410)
Labor Augmented	0.203	0.402	0.211	0.408	0.004***	(7.166)
C-Section after Attempted Labor	0.096	0.294	0.074	0.262	-0.011***	(-24.533)
Severe Maternal Morbidity	0.011	0.105	0.011	0.103	-0.001***	(-4.543)
No Reported Maternal Morbidity	0.987	0.113	0.988	0.108	0.002***	(12.811)
3rd or 4th Degree Perineal Laceration	0.004	0.061	0.005	0.072	0.001***	(10.664)
Ruptured Uterus	0.000	0.021	0.000	0.018	-0.000***	(-3.621)
Unplanned Hysterectomy	0.000	0.022	0.000	0.021	-0.000*	(-1.759)
Maternal ICU	0.002	0.049	0.002	0.041	-0.001***	(-9.765)
Transfusion	0.005	0.071	0.004	0.063	-0.001***	(-10.013)
Pre-Pregnancy Diabetes	0.012	0.111	0.010	0.099	-0.003***	(-17.526)
Gestational Diabetes	0.049	0.217	0.064	0.244	0.010***	(26.761)
Gestational Hypertension	0.014	0.117	0.010	0.100	-0.002***	(-11.680)
Pre-Pregnancy Hypertension	0.038	0.191	0.016	0.127	-0.019***	(-82.311)
Previous Pre-Term Birth	0.053	0.224	0.037	0.190	-0.011***	(-38.691)
Low Birth Weight	0.143	0.350	0.082	0.274	-0.053***	(-112.684)
Very Low Birth Weight	0.028	0.166	0.013	0.111	-0.015***	(-70.950)
Early Delivery	0.461	0.498	0.383	0.486	-0.076***	(-98.102)
Very Early Delivery	0.015	0.123	0.006	0.080	-0.008***	(-53.434)
C-Section	0.344	0.475	0.310	0.462	-0.029***	(-38.693)
Infant Living	0.995	0.070	0.998	0.050	0.002***	(24.446)
NICU	0.118	0.322	0.089	0.284	-0.024***	(-51.267)
home_unintended	0.002	0.050	0.001	0.035	-0.001***	(-14.215)
Birth Attendee - Midwife, Other	0.002	0.047	0.004	0.062	0.005***	(38.148)
vag_after_cesarean	0.022	0.148	0.018	0.133	-0.004***	(-19.052)
Prenatal Care Started Late	0.068	0.252	0.057	0.232	-0.011***	(-30.201)
Months of Prenatal Care	3.262	1.809	3.112	1.672	-0.123***	(-43.284)
Number of Prenatal Visits	9.477	4.578	10.074	4.263	0.415***	(61.573)
Total Cigarettes Smoked	3.784	16.595	5.387	16.808	2.040***	(76.959)
Breastfeeding Initiated	0.639	0.480	0.754	0.431	0.095***	(138.845)

Statistics are generated from all Medicaid-covered births in all states, for which the birthing person identified only as Black or White. \*\*\*, \*\*, and \* Differences statistically significant at 1%, 5%, and 10%, respectively.

Table 2  
Summary Statistics: Medicaid Births, After Doula Reimbursement

	Black Medicaid		White Medicaid		Difference	
	Mean	sd	Mean	sd	Difference	t-stat
Birth Attendee - Non-Midwife	0.009	0.095	0.009	0.096	0.000	(1.007)
Full-Term Delivery	0.286	0.452	0.335	0.472	0.049***	(42.046)
Healthy Birth Weight	0.865	0.342	0.921	0.269	0.056***	(76.869)
Vaginal Delivery	0.653	0.476	0.691	0.462	0.038***	(32.492)
Labor Induced	0.231	0.421	0.271	0.444	0.040***	(36.116)
Birth Complications	0.366	0.482	0.331	0.471	-0.036***	(-29.892)
Labor Augmented	0.166	0.372	0.190	0.393	0.024***	(24.641)
C-Section after Attempted Labor	0.087	0.282	0.077	0.267	-0.010***	(-14.790)
Severe Maternal Morbidity	0.012	0.110	0.010	0.101	-0.002***	(-7.249)
No Reported Maternal Morbidity	0.986	0.117	0.986	0.116	0.000	(1.425)
3rd or 4th Degree Perineal Laceration	0.005	0.070	0.004	0.067	-0.001***	(-3.119)
Ruptured Uterus	0.000	0.021	0.000	0.016	-0.000***	(-4.156)
Unplanned Hysterectomy	0.001	0.022	0.000	0.020	-0.000	(-1.618)
Maternal ICU	0.003	0.054	0.002	0.044	-0.001***	(-8.261)
Transfusion	0.004	0.066	0.004	0.065	-0.000	(-0.625)
Pre-Pregnancy Diabetes	0.014	0.117	0.011	0.105	-0.003***	(-9.628)
Gestational Diabetes	0.068	0.252	0.079	0.270	0.011***	(16.582)
Gestational Hypertension	0.002	0.047	0.002	0.049	0.000	(1.498)
Pre-Pregnancy Hypertension	0.035	0.184	0.019	0.138	-0.016***	(-40.385)
Previous Pre-Term Birth	0.047	0.213	0.038	0.191	-0.009***	(-19.127)
Low Birth Weight	0.134	0.341	0.078	0.269	-0.056***	(-76.544)
Very Low Birth Weight	0.026	0.159	0.012	0.109	-0.014***	(-45.061)
Early Delivery	0.451	0.498	0.374	0.484	-0.077***	(-62.894)
Very Early Delivery	0.014	0.117	0.006	0.077	-0.008***	(-34.836)
C-Section	0.347	0.476	0.309	0.462	-0.038***	(-32.492)
Infant Living	0.996	0.060	0.998	0.046	0.002***	(12.447)
NICU	0.127	0.334	0.092	0.289	-0.035***	(-46.223)
home.unintended	0.003	0.057	0.002	0.045	-0.001***	(-10.181)
Birth Attendee - Midwife, Other	0.006	0.075	0.009	0.094	0.003***	(14.468)
vag_after_cesarean	0.031	0.173	0.022	0.147	-0.009***	(-22.472)
Prenatal Care Started Late	0.073	0.261	0.058	0.235	-0.015***	(-24.464)
Months of Prenatal Care	3.360	1.807	3.147	1.660	-0.213***	(-48.920)
Number of Prenatal Visits	9.460	4.409	10.472	4.200	1.012***	(92.793)
Total Cigarettes Smoked	2.174	12.703	3.706	13.493	1.533***	(45.964)
Breastfeeding Initiated	0.779	0.415	0.849	0.358	0.070***	(74.322)

Statistics are generated from all Medicaid-covered births in all states, for which the birthing person identified only as Black or White. \*\*\*, \*\*, and \* Differences statistically significant at 1%, 5%, and 10%, respectively.

Table 3  
Summary Statistics: Health Outcomes among Black Medicaid Births – With vs. Without  
Attendee

	Attendee Present		No Attendee Present		Difference	
	Mean	sd	Mean	sd	Difference	t-stat
Birth Attendee - Non-Midwife	1.000	0.000	0.000	0.000	-1.000	(.)
Full-Term Delivery	0.251	0.434	0.268	0.443	0.017***	(6.750)
Healthy Birth Weight	0.828	0.378	0.857	0.350	0.029***	(14.839)
Vaginal Delivery	0.876	0.330	0.654	0.476	-0.221***	(-83.700)
Labor Induced	0.176	0.380	0.254	0.435	0.078***	(32.157)
Birth Complications	0.134	0.340	0.371	0.483	0.238***	(88.390)
Labor Augmented	0.138	0.345	0.202	0.401	0.064***	(28.528)
C-Section after Attempted Labor	0.032	0.175	0.096	0.294	0.064***	(39.199)
Severe Maternal Morbidity	0.009	0.093	0.011	0.105	0.003***	(4.355)
No Reported Maternal Morbidity	0.985	0.121	0.987	0.114	0.002***	(2.737)
3rd or 4th Degree Perineal Laceration	0.003	0.051	0.004	0.062	0.001***	(3.328)
Ruptured Uterus	0.000	0.018	0.000	0.021	0.000	(1.237)
Unplanned Hysterectomy	0.000	0.017	0.000	0.022	0.000*	(1.712)
Maternal ICU	0.002	0.039	0.002	0.050	0.001***	(3.453)
Transfusion	0.005	0.067	0.005	0.070	0.000	(1.053)
Pre-Pregnancy Diabetes	0.007	0.084	0.013	0.112	0.005***	(8.778)
Gestational Diabetes	0.036	0.186	0.050	0.219	0.015***	(12.054)
Gestational Hypertension	0.007	0.083	0.013	0.114	0.006***	(9.808)
Pre-Pregnancy Hypertension	0.027	0.162	0.038	0.191	0.011***	(10.448)
Previous Pre-Term Birth	0.058	0.234	0.053	0.224	-0.005***	(-4.037)
Low Birth Weight	0.163	0.369	0.142	0.349	-0.021***	(-10.712)
Very Low Birth Weight	0.039	0.194	0.028	0.165	-0.011***	(-11.992)
Early Delivery	0.492	0.500	0.460	0.498	-0.032***	(-11.449)
Very Early Delivery	0.028	0.164	0.015	0.122	-0.012***	(-18.184)
C-Section	0.124	0.330	0.346	0.476	0.221***	(83.700)
Infant Living	0.984	0.125	0.995	0.069	0.011***	(29.101)
NICU	0.124	0.329	0.118	0.323	-0.005***	(-2.967)
home_unintended	0.203	0.402	0.001	0.027	-0.202***	(-806.197)
Birth Attendee - Midwife, Other	0.000	0.000	0.002	0.049	0.002***	(8.951)
vag_after_cesarean	0.030	0.171	0.023	0.149	-0.007***	(-8.779)
Prenatal Care Started Late	0.075	0.263	0.069	0.253	-0.006***	(-4.238)
Months of Prenatal Care	3.164	2.048	3.268	1.807	0.104***	(10.034)
Number of Prenatal Visits	8.240	5.083	9.487	4.563	1.247***	(47.856)
Total Cigarettes Smoked	4.698	18.578	3.687	16.389	-1.011***	(-11.077)
Breastfeeding Initiated	0.651	0.477	0.647	0.478	-0.004	(-1.496)

Statistics are generated from all Medicaid-covered births in all states, for which the birthing person identified only as Black or White. \*\*\*, \*\*, and \* Differences statistically significant at 1%, 5%, and 10%, respectively.

Table 4  
Effects of Doula Reimbursement

	All	AAPI	AIAN	Black	Hispanic	White
Doula Present	-0.002 (0.0001)	0.0014* (0.0008)	0.0002 (0.0017)	-0.0001 (0.0003)	-0.0004 (0.0002)	-0.0002 (0.0002)
No Reported Maternal Morbidity	0.0069** (0.0006)	-0.0019 (0.0030)	-0.0072 (0.0111)	-0.0111*** (0.0011)	0.0014 (0.0009)	0.0061*** (0.0008)
Healthy Term Delivery	0.0061*** (0.0008)	0.0036 (0.0042)	0.0130 (0.0086)	0.0082*** (0.0013)	0.0025 (0.0013)	0.0043*** (0.0010)
Healthy Birth Weight	0.0013** (0.0005)	0.0021 (0.0025)	0.0153** (0.0051)	-0.0006 (0.0010)	0.0026*** (0.0007)	0.0020*** (0.0005)
C-Section	-0.0075*** (0.0008)	-0.0056 (0.0040)	-0.0176* (0.0083)	-0.0074*** (0.0014)	-0.0159*** (0.0013)	-0.0080*** (0.0009)
N	15039677	618004	232222	3538275	5461709	10232676

Results come from a model with state, birth month, and year fixed effects. Standard errors are clustered at the state level to account for auto-correlation within states. For each race/ethnicity, a birth event is coded to a given race if that is the only race reported by the birthing person. AAPI stands for Asian American/Pacific Islander; AIAN stands for American Indian/Alaska Native. \*\*\*, \*\*, and \* Differences statistically significant at 1%, 5%, and 10%, respectively.



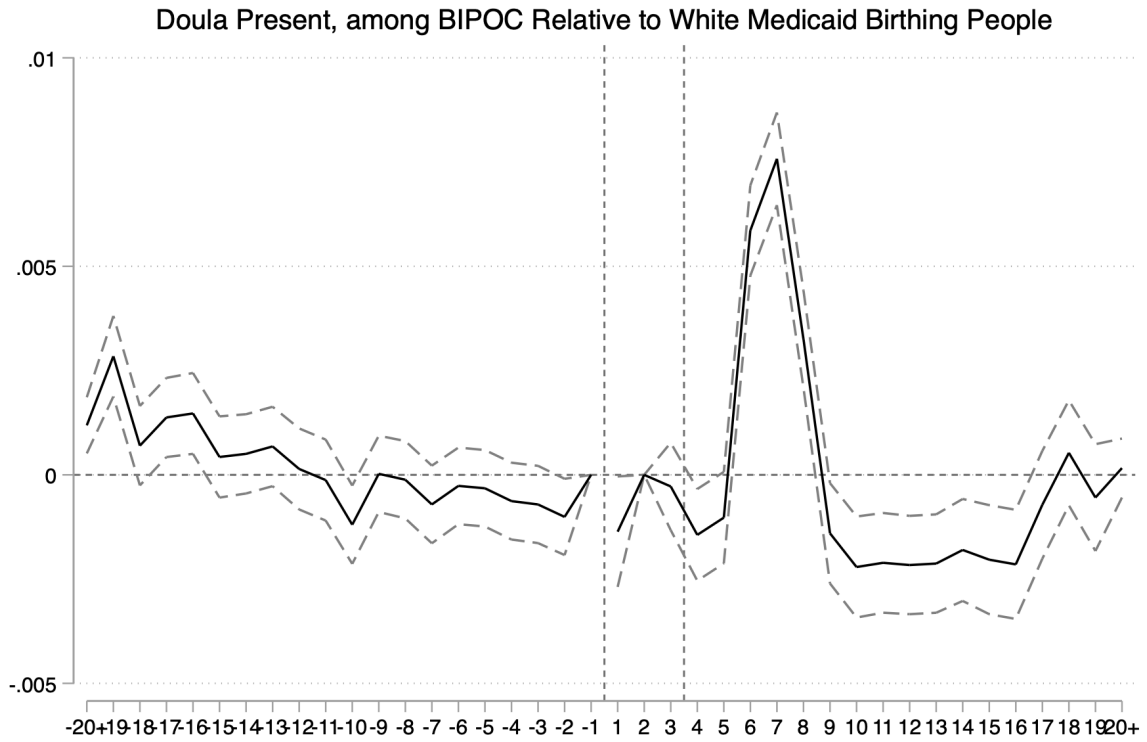
# Figures

Figure 1  
State Status on Medicaid Coverage of Doula Care



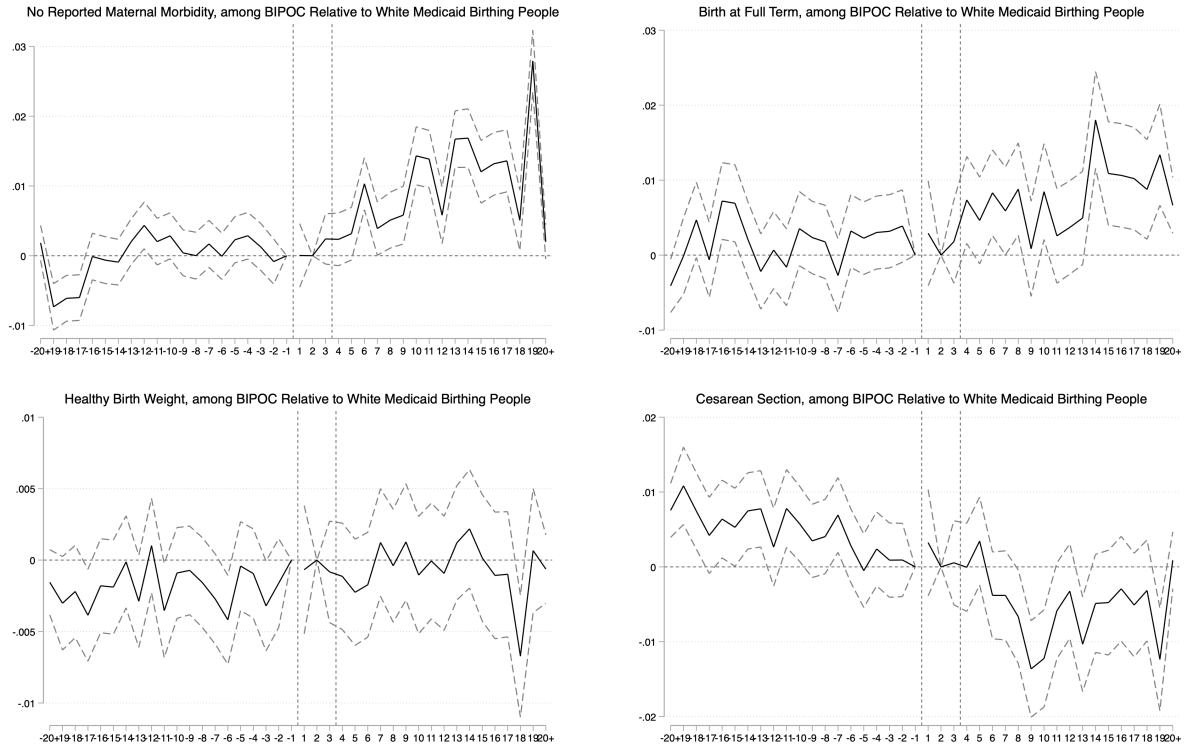
Notes: This map, from Chen (2022), denotes which states have a Medicaid Doula program implemented, which are working on implementation, and which are pursuing non-Medicaid adjacent action. Note that Arizona, Colorado, Delaware, Indiana, Louisiana, Pennsylvania, Tennessee, and Washington's adjacent actions have not come into existence yet and/or do not provide direct financial support for doula care and as such are treated as comparison states that do not have conflicting 'treatment' occurring.

Figure 2  
Doula Coverage and Doula Presence



Notes: This figure plots the estimated effect of Medicaid coverage of doula care on the presence of a doula. The model controls for county, state, month, and year fixed effects. Gray lines represent the upper and lower 95% confidence intervals, and year 0 represents the first year in which doula care was covered by Medicaid. Only Medicaid-covered births are considered in these analyses

Figure 3  
Effects of Doula Coverage on Birth-Related Health Outcomes



Notes: This figure plots the estimated effect of Medicaid coverage of doula care on maternal morbidity, full-term birth, healthy birth weight, and C-section. The model controls for county, state, month, and year fixed effects. Gray lines represent the upper and lower 95% confidence intervals, and year 0 represents the first year in which doula care was covered by Medicaid. Only Medicaid-covered births are considered in these analyses.