

*Impact of Doula Services on the Maternal Health of Black Medicaid-Insured Mothers:
A Regression Analysis*

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Abstract

There is a strong, well-documented link between income, race, and health disparities, including birth outcomes. Communities of color, particularly black communities, are affected disproportionately by this health disparity. Within the black community, black mothers are among the most vulnerable populations due to structural barriers. They are at a higher risk of death due to lack of access to healthcare and education and they are subjected to structural racism surrounding pregnancy, birth, and breastfeeding. The Maternal Mortality Rate (MMR) is the number of documented maternal deaths due to pregnancy- or birth-related complications per 100,000 live births during a certain time period. Nationally, black women have a 2.4-3 times higher MMR than White women (CDC, 2020). In Maryland, Black women are 2.75 times more likely to die of pregnancy-related causes than their White counterparts (MMHIP, 2021). Black mothers are also at higher risks of negative birth outcomes, like c-sections, in which incidences occur at a 4% higher rate than for non-black women (Huesch and Doctor, 2015). Black mothers who are Medicaid eligible are at an ever higher risk for negative birth and postpartum outcomes (Mallick, L., Thomas, M., Shenasssa, E., 2022).

Doula services could be part of the solution. A doula is a professional labor assistant and advocate who provides physical and emotional support during pregnancy, labor, and postpartum to a pregnant person. Doulas meet with families during pregnancy to discuss birth choices and labor coping strategies. During labor and delivery, doulas provide comfort measures, such as touch, massage, and movement and breathing techniques, which can lead to less medical interventions in birth, like c-sections. Doula services have been shown to improve birth outcomes and maternal health broadly (Ellman, 2020).

Given these benefits, this research paper explores the impact that doula services have on maternal health outcomes of Medicaid-insured Black mothers in California. “Medicaid eligible” describes individuals whose income is at a low enough level that the government subsidizes their medical costs. In Maryland, for instance, all adults under the age of 65 with “incomes at or below 138% of the Federal Poverty Level or about \$1,564 per month for a household of one person in 2022” are eligible for Medicaid (MDH, 2022). Medicaid covered 65% of the births for black women nationally in 2019 (Nickelson, 2021). The results can lay a foundation for future policy considerations that the State of Maryland can consider involving insurance coverage for doulas.

Literature Review

Several current studies look at the relationship between doula services and maternal health outcomes of low-income mothers. Some of the studies further break down the data by race^[NK1]. This analysis looks at the maternal health effects that doula support has on the specific population of low-income Black mothers.

Social determinants of health are conditions in the environment where people live, learn, work, play, and pray that affect health and quality of life. Kozhimannil et al. (2016) explore how doula services can reduce the effect of social determinants of health during pregnancy and childbirth. They interviewed four focus groups of low-income pregnant women who communicated that doulas increased the participants' health literacy and the quality of health care that they received during pregnancy and birth (Kozhimannil et al., 2016). The majority of the participants (38.5%) in this study were African-American. Participants indicated that doulas contribute to their ability to access health services and facilitate improved patient-provider interactions. According to this study, doulas appear to be instrumental in enhancing the mothers' satisfaction with birth experiences and birth outcomes .

Furthermore, Kozhimannil, Haedeman, et al. (2013) compared the childbirth-related outcomes from Medicaid recipients who received doula services from a national sample of similar women. The study population consisted of women who had Medicaid-funded births nationwide and Medicaid beneficiaries who had doula support. They looked at data from 2010-2012. Their findings showed that the odds of a cesarean delivery (c-section) were 40.9% lower for doula-supported births than births that were not supported by doulas (Kozhimannil et al., 2013). Although their research aims to highlight the Medicaid cost savings that doulas can provide during birth, it also demonstrates that health outcomes are better as well. Cesarean deliveries pose a higher risk of health complications for both mother and baby. In this study, doulas were associated with lower incidents of c-sections among medicaid recipients.

The type of respect and treatment that pregnant mothers receive can also have an impact on their health outcomes. Not only are racialized and low-income groups subjected to poorer health care, but they also tend to experience higher levels of mistreatment, discrimination and disrespect than those who identify as White (Vedam et al., 2019). Mallick, et al. explored the relationship between doula services and the level of respectful care during birth that marginalized communities receive, which included low-income mothers of color (2022). The research examined data collected from the Listening to Mothers in California Survey (Sakala, et al. 2018). Overall, they found a 40% higher chance of respectful care among women who were supported by a doula than those who were not and that the association between doulas and respectful care was stronger among Medicaid-insured mothers of color. This cohort of mothers may normally experience poor communication, dismissal of concerns, and racism which could lead to harmful birth consequences. Mallick's research suggests that marginalized groups of mothers may receive more respectful care with a doula than without (2022).

These studies show that on average doula services are not only associated with better maternal health outcomes but are also associated with lower medical costs. Doulas are a cost-effective intervention to reduce Cesarean deliveries, improve health literacy, and increase

respectful care of Medicaid-insured mothers. Despite these benefits, only some states offer doula coverage through Medicaid.

Very recently, on February 21, 2022, Maryland Medicaid declared that it would provide coverage for doula/birth worker services to Medicaid beneficiaries (MHD, 2022). Although the allowed reimbursement amounts are not nearly enough to adequately compensate doulas, this is a first step towards health parity for low-income Black women in Maryland . The research suggests that there should be a policy change to Medicaid in all states. The U.S. should strongly consider universal Medicaid coverage for doula services as one way to combat the maternal health crisis among Black, low-income mothers.

Data/Methodology

The data that was used for the following section is from the Listening to Mothers in California Survey (Sakala, et al., 2020). I downloaded the SPSS file from this [website](#) and imported it into STATA, so that I could analyze it. The following tables and regression begins to explore the interaction between doula services and the maternal health of low-income Black mothers. Although the population of Baltimore and California are very different, this begins to answer the question whether doula services have an impact on birth outcomes for Medicaid-insured Black mothers .

The following table shows the participants who identify as Black:

black	Freq.	Percent	Cum.
0	2,258	88.93	88.93
1	281	11.07	100.00
Total	2,539	100.00	

The following table shows the participants that identify as being insured by California Medicaid:

medicaidinsured	Freq.	Percent	Cum.
0	1,328	52.30	52.30
1	1,211	47.70	100.00
Total	2,539	100.00	

The following table shows participants who have doula support during birth:

doulasupport	Freq.	Percent	Cum.
0	2,145	84.48	84.48
1	394	15.52	100.00
Total	2,539	100.00	

The following table shows participants who had a c-section delivery:

csection	Freq.	Percent	Cum.
0	1,809	71.25	71.25
1	730	28.75	100.00
Total	2,539	100.00	

The following table shows participants whose births were attended by a midwife:

Attendant at birth was a midwife	Freq.	Percent	Cum.
0	2,156	84.92	84.92
Yes	383	15.08	100.00
Total	2,539	100.00	

The following table shows participants whose labor was induced:

Did your maternity care provider try to induce your labor in any way?	Freq.	Percent	Cum.
Yes	998	39.59	39.59
No	1,523	60.41	100.00
Total	2,521	100.00	

Based on the dataset, I have chosen Cesarean delivery (c-section) as an indicator of maternal health outcome, and therefore c-section is my dependent variable. My independent variables are age, mothers who identify as black, mothers who are Medicaid-insured, doula support during labor, if a midwife attended the birth and if the labor was induced. "Doulas" could be a proxy for a pregnant woman's ability to access birth education, support, and/or advocacy affecting her birth outcome. The regression model this paper will examine is:

$$\text{C-section} = b_1\text{age} + b_2\text{midwife} + b_3\text{doula support} + b_4\text{black race} + b_5\text{medicaid insured} + b_6\text{labor induced}$$

The following regression analysis shows how the independent variables affect the dependent variable:

Source	SS	df	MS	Number of obs	=	2,432
Model	53.2580767	6	8.87634612	F(6, 2425)	=	48.11
Residual	447.373091	2,425	.184483749	Prob > F	=	0.0000
				R-squared	=	0.1064
				Adj R-squared	=	0.1042
Total	500.631168	2,431	.205936309	Root MSE	=	.42952

csection	Coefficient	Std. err.	t	P> t	[95% conf. interval]	
age	.0088591	.0016011	5.53	0.000	.0057193	.0119988
midwife	-.3261411	.0245161	-13.30	0.000	-.3742157	-.2780664
doulasupport	-.059022	.0243712	-2.42	0.016	-.1068126	-.0112315
black	.1010696	.0277139	3.65	0.000	.0467242	.1554149
medicaidinsured	.0287061	.0185484	1.55	0.122	-.0076661	.0650784
laborinduced	.1228272	.0178458	6.88	0.000	.0878326	.1578218
_cons	-.1342346	.0586825	-2.29	0.022	-.2493076	-.0191616

Results

The most significant factors of whether a mother will have a Cesarean delivery is if her birth is attended by a midwife and/or if her labor is induced. In general, a midwife reduces the chance of a c-section by 32%, while induced labor increases the chance of a c-section 12%. These two factors are significant at the 1% level. However, race and doula support were also important factors. Black mothers are at a 10% increased rate of having a c-section and is significant at the 1% level. Doula support was associated with about a 6% decrease in c-sections with a significant at a 5% level. Being insured by Medicaid was not a significant factor in the incidence of c-section and increased a mother's chance of c-section by only ~3 %.

The R^2 for this regression is just over .10, which means that 10% c-sections are explained by my model. Therefore, further research is needed to build on explaining the impact of doula support on the incidence of c-sections.

Conclusion

This research suggests that, in general, doula support decreases the incidence of c-section rates of mothers in this dataset. However, C-sections are only one indicator of maternal health

outcomes. Further research is needed to determine if doula services improve other facets of maternal health for low-income Black women. In addition to pregnancy related health disparities, black women also face disparities after birth. Breastfeeding has a positive impact on maternal health in such ways as lowering the risk of breast cancer, ovarian cancer and heart disease (AGOG, 2018). The national rate for Black women ever breastfeeding is nearly 18% lower than White women (Louis-Jacques, 2018). It would be interesting to investigate using this data if breastfeeding rates increased with the support of a doula.

Furthermore, now that Maryland has enacted Medicaid coverage for doula services, the impact of doula services on low-income Black mothers in Maryland should be studied specifically. Maryland maternal health disparity can be observed most significantly in Baltimore City, where the black population there is 62.4% – double the black population in Maryland and over four times as large as the U.S. population in general. Because Baltimore is a segregated city, there are extreme instances of health disparity in Black populated areas. These disparities reveal the presence of structural racism in the healthcare system and other social systems in Baltimore. Maryland and Baltimore City should explore the impact that doula services have on this most vulnerable population.

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