



# The Association Between Race and Interventional Thresholds in Unplanned Cesarean Deliveries

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## INTRODUCTION

U.S. maternal mortality rates are the highest among developed nations, rising from 20.1 to 32.9 deaths per 100,000 live births between 2019 and 2021. Mortality among Non-Hispanic Black women are more than double the rate of non-Hispanic white women. Cesarean deliveries (CDs) account for nearly one-third of all U.S. births with rates nearly 20% higher in Black women.

## HYPOTHESIS

We hypothesized that Non-Hispanic Black patients undergo cesarean delivery earlier in labor than non-Hispanic White patients.

## OBJECTIVE

We aimed to examine the impact of race on timing, indications, and complications in unplanned cesarean deliveries (CDs)

## METHODS

- Retrospective, cohort study using the Perinatal Registry (PARITY) database
- Primiparous patients undergoing singleton term cesarean delivery at a large academic center and affiliated hospitals
- July 2017–June 2019 & July 2021–June 2023
- Mann-Whitney U, Chi-square/Fisher's exact tests; multivariable logistic regression with backward selection ( $p < 0.05$ )

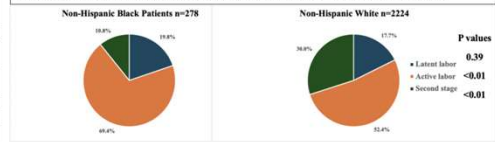
Table 1: Baseline Characteristics of Patients Undergoing Cesarean Delivery by Race

Baseline Characteristics	Overall N=3,277	Non-Hispanic Black n=327	Non-Hispanic White n=2,950	p-value
	n (%) or median (IQR)			
Maternal age (years)	30.0 (26.0–34.0)	26.0 (21.0–31.0)	31.0 (27.0–34.0)	<.01
Gestational age at delivery (days)	275.0 (269.0–281.0)	276.0 (269.0–282.0)	275.0 (269.0–281.0)	0.21
BMI closest to delivery (kg/m <sup>2</sup> )	31.6 (27.9–36.3)	32.0 (27.6–36.9)	31.5 (27.9–36.2)	0.37
Marital status				<.01
Married/current partner	90.9%	53.8%	83.9%	
Single/no partner	19.0%	46.2%	16.0%	
Insurance at delivery				<.01
Public	20.2%	55.7%	16.4%	
All other	79.7%	44.3%	83.6%	
Comorbidities				
Chronic hypertension	6.9%	12.2%	6.3%	<.01
Gestational hypertension	18.0%	16.2%	18.2%	0.37
Chronic diabetes (Type 1 or 2)	3.4%	5.2%	3.2%	0.06
Gestational diabetes	7.2%	7.9%	7.1%	0.58
Asthma	8.0%	9.8%	7.8%	0.22
Cardiovascular disease	7.9%	7.0%	8.0%	0.53
Pre-eclampsia	16.1%	18.0%	15.9%	0.33
Preterm labor	1.7%	3.1%	1.5%	0.03
Delivery information				
Unplanned	77.4%	87.2%	76.4%	<.01
Labor	76.8%	85.0%	75.8%	<.01
Induction or augmentation	65.5%	71.9%	64.8%	0.01
Indication for CD				
Failure to progress	39.8%	29.9%	40.9%	<.01
Non reassuring fetal status	34.0%	54.4%	31.7%	<.01
Fetal CI for VD	22.9%	15.3%	23.7%	0.11
Maternal CI for VD	8.8%	10.7%	8.6%	0.15
Cephalopelvic disproportion	2.4%	2.1%	2.4%	0.74
Failed operative delivery	0.6%	0.0%	0.7%	0.25
Bleeding concerns	0.2%	0.3%	0.2%	0.57
Elective	1.2%	0.6%	1.3%	0.43

Table 2: Duration Metrics Among Laboring Patients with Unplanned CDs; N=2,502

Duration Metrics	Non-Hispanic Black n=278 Median Mins (IQR)	Non-Hispanic White n=2,224 Median Mins (IQR)	p-value
Labor onset to Latent labor CD start	531.0 (252–1062)	685.0 (257–1281)	0.37
Labor onset to Active labor CD start	479.0 (248–826)	581.0 (327–876)	0.04
Labor onset to 2nd stage CD start	229.5 (135.0–299.0)	234.0 (176.0–300.0)	0.46
1st stage of labor total duration	1194.5 (591–2327)	630.0 (345–1043)	<.01
Rupture of membranes to CD start	576.0 (243.6–982.0)	677.9 (365.7–1044.9)	0.01
Admission to CD start	1,348.5 (806–2002)	1,393.0 (876–1940)	0.68
Total duration of CD	40.5 (32–52)	40.0 (32–49)	1.14

Figure 1. Percentage of Women Grouped by Race and Stage of Labor to Cesarean Delivery



Percentages represent the proportion of patients within each racial group undergoing cesarean delivery at each labor stage. Latent labor was defined as cervical dilation of 0–3 cm at the time of cesarean delivery; active labor as cervical dilation  $\geq 4$  cm and  $< 10$  cm; and second stage as cervical dilation of 10 cm at the time of cesarean delivery.

Figure 2: Peripartum Complication Rates by Race

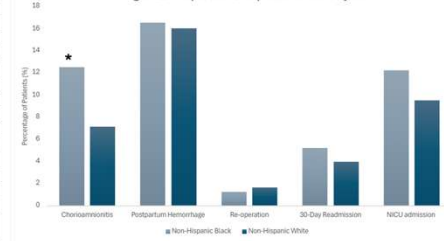
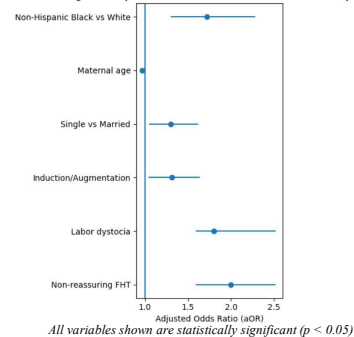


Figure 3. Adjusted Odds of Active Labor Cesarean Delivery



All variables shown are statistically significant ( $p < 0.05$ )

## HIGHLIGHTS

In this retrospective cohort study, Black patients were more likely to:

- Be younger, have public insurance, & chronic HTN
- Undergo unplanned CD
- Undergo CD for non-reassuring fetal status (54% vs 32%)
- Undergo CD during the active phase of labor (69% vs 52%)
- Have longer first stage of labor (1195 vs 630 min)
- Develop chorioamnionitis (13% vs 7%)
- Have longer hospital stays (median 4 vs 3 days)

And less likely to

- Undergo CD for failure to progress (30% vs 41%)
- Reach the second stage of labor prior to CD (11% vs 30%)

## CONCLUSIONS

Disparities exist in labor duration, timing of CD, and rates of chorioamnionitis among patients undergoing CD.

Determining underlying causes may direct guidelines to improve Black maternal health.

## ACKNOWLEDGEMENTS

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