

# Racial Disparities in Cesarean Delivery: The Role of Labor Management Practices

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## Background

The cesarean delivery (CD) rate has increased dramatically since 1990 despite concerns about maternal complications (e.g. infection, blood loss, hysterectomy, repeat cesarean delivery, uterine rupture, death) and skyrocketing costs for both patients and insurers. While cesarean delivery is a necessary and beneficial procedure, international comparisons make clear that the US rate greatly exceeds the threshold of 10-20 percent recommended to optimize maternal and neonatal outcomes.

### Cesarean Delivery Rates Exceed Optimal Levels

- CD is the most common inpatient surgery in the US
- 32% of all births are via cesarean
- 1.2 million cesarean deliveries in 2017
- a reduction of rates recommended in Healthy People 2020 could save US insurers and patients \$1.7-2.5B a year

### As Rates of Cesarean Delivery Increased, Disparities Emerged

- Prior to 1994 rates of cesarean delivery among Black and White mothers were similar
- Starting in 1994, the rate of CD increased 61%, compared to 33% among non-Hispanic white women
- Odds of CD are 30% higher for African American (AA) women and these disparities persist after adjustment for demographic and clinical characteristics

## Objectives

To examine the contribution of common labor management strategies to growing racial disparities in cesarean delivery using electronic health record data. We hypothesize that AA patients may have less autonomy to negotiate reduced interventions with hospital staff and/or be perceived as at higher risk for adverse maternal and neonatal outcomes. Specifically, we aim to:

1. Construct a "Labor and Delivery Data Mart" from Cerner Health Facts
2. Estimate the association of EFM-measured diagnoses of fetal distress and cesarean delivery within strata of race/ethnicity adjusting for clinical and demographic characteristics
3. Estimate the frequency of medical induction of labor and its association with cesarean delivery stratified by race/ethnicity adjusting for clinical and demographic characteristics

## Acknowledgments

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### Despite Reduction in CD Rates, Disparities Continue to Rise

- CD plateaued starting in 2013, black-white disparities in cesarean delivery rates continue to increase (Figure 1)

### Role of Labor Management Practices in Racial Disparities

During the period of time racial disparities in CD emerged, labor management practices, including the use of electronic fetal monitoring (EFM) and medical induction (MI), have also increased dramatically.

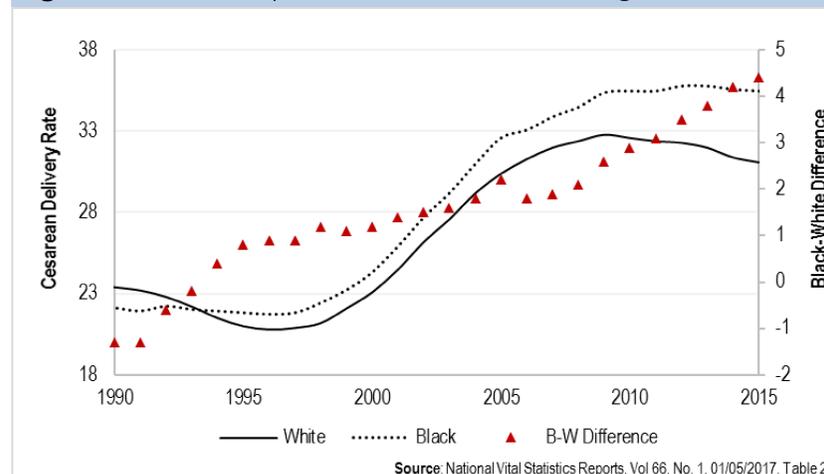
### Fetal Monitoring (FM)

- FM - tracking the fetal heart rate along with uterine contractions - provides a measure of oxygenation of the fetus
- Limitations of FM include poor reliability, uncertain efficacy and a high-false positive rate
- Continuous FM does not improve infant mortality or overall neonatal well-being
- Despite these limitations, FM, and in particular continuous FM, have increased dramatically since the 1980s and is almost universal among hospital deliveries
- The proliferation of FM is implicated in increasing rates of cesarean delivery fetal distress is the single largest contributor to increasing primary CD; rates of reported fetal distress may be higher among AA patients

### Medical Induction

- between 1990 and 2015 rates of medical induction have more than doubled (9.5% to 23.8%)
- Since 1995 AA women had much steeper rates of increase of MI than non-Hispanic white women (93% vs. 43%).
- AA undergoing induction may have greater risk of cesarean; AA nulliparous women who have been induced have a rate of cesarean 32% higher than their peers who were not induced

Figure 1. Racial Disparities in CD Rates Emerge after 1994

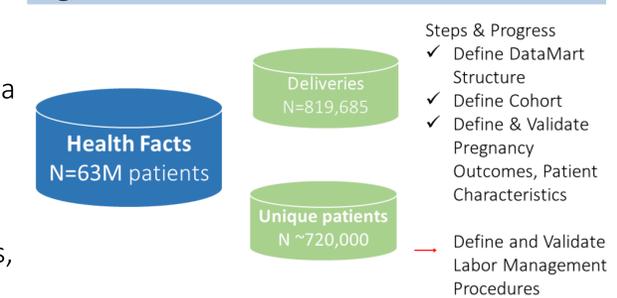


## Delivery DataMart

### Cerner Health Facts

- A de-identified database populated with information aggregated from facilities that implement Cerner electronic health record (EHR) software
- Data include comprehensive clinical records from inpatient and outpatient encounters and includes data from pharmacy, laboratory, registration and billing data
- All encounters, laboratory orders and tests, procedures, medications and most clinical events and assessments (height, weight, and vitals) are time-stamped and sequenced

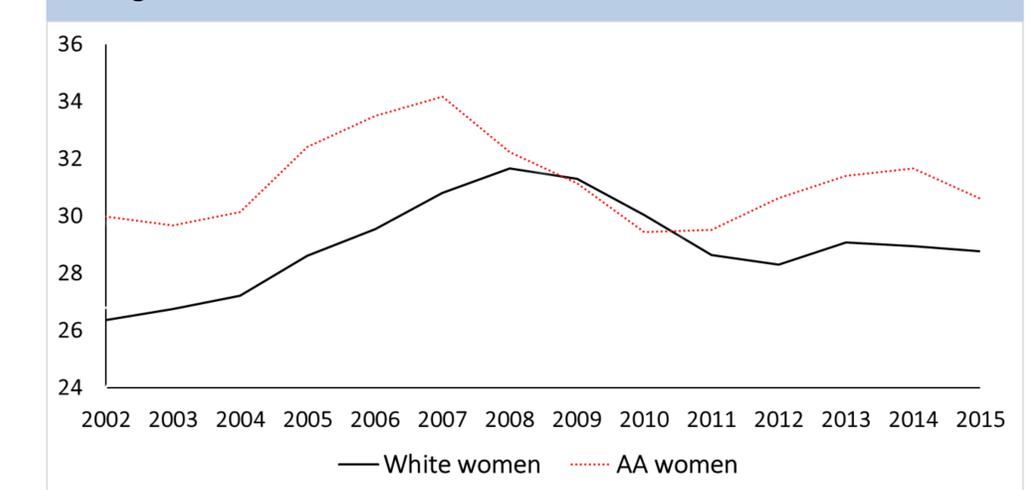
Figure 2. Cesarean Deliveries in HF



## Prevalence of Cesarean Delivery

- DataMart includes 816,685 deliveries; N=212,578 via cesarean
- 32% of deliveries are via cesarean; rate of CD is higher among AA women compared with White, non-Hispanic women (30.9% vs. 29.1%)

Figure 3. 3-Year Moving Average of Prevalence of Cesarean Delivery among African American and White Women



- Preliminary analyses confirm nationally observed disparities in CD rates
- Notable reductions in cesarean delivery observed among all women
- AA women have had notable increases in CD rates after 2010

### Next Steps

- Definition and validation of labor management practices including electronic fetal monitoring and methods of medical labor induction, including oxytocin, membrane stripping, and amniotomy
- Refinement of definitions of indications for cesarean delivery and primary cesarean delivery