



# Racial disparities in cesarean delivery rates: Do hospital type, setting, and volume matter?

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### Background

- In California, Black women are 4 times more likely to die from a pregnancy-related cause than White women.
- This gap has persisted despite the state’s 55% reduction in maternal mortality over the past 7 years.
- The causes for this disparity are not well defined, though undoubtedly mediated by structural inequities.

### Objective

- We aimed to identify and compare racial disparities in cesarean delivery rates among hospitals of different type (academic vs non-academic), setting (urban vs rural), and volume (measured in annual deliveries).

### Study Design

- Retrospective cohort study
- Inclusion: Singleton term vertex live births in nulliparous Black and White women in California between 2005 and 2012
- Primary outcome: Risk of cesarean delivery
- Predictor: Race
- Statistical analysis: Risks calculated using univariable and multivariable logistic regression, and adjusted for maternal age, maternal body mass index, medical comorbidities, gestational age, labor type (spontaneous vs induction), and birthweight.

### Results

- Included 59,441 Black (CD rate 30.2%) and 363,624 White women (CD rate 26.1%)
- Black women were significantly more likely to have a CD in nearly all hospital types, settings, and volume with aRRs ranging from 1.1 to 1.3-fold higher than White women.

### Conclusion

- Black women had significantly higher rates of CD than White women in nearly all hospital categories, even after adjusting for potential confounders.
- These global increased risks likely reflect structural inequities in care.
- This data should encourage providers, hospital systems, and quality collaboratives to further investigate racial disparities in CD rates and develop mechanisms for mitigating them.

## Racial disparities in cesarean delivery rates in California are similar across hospital types, settings, and volumes.



Questions?  
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| Table 1. Patient characteristics |                             |                  |                   |
|----------------------------------|-----------------------------|------------------|-------------------|
|                                  |                             | Black (n=59,441) | White (n=364,624) |
| Age                              | Median (years)              | 22               | 28                |
|                                  | IQR (years)                 | 8                | 9                 |
|                                  | ≥ 35 years                  | 3,688 (6.2)      | 56,083 (15.4)     |
|                                  |                             |                  |                   |
| Insurance type                   | Private                     | 24,743 (41.6)    | 269,277 (73.9)    |
|                                  | Public                      | 30,983 (52.1)    | 78,976 (21.7)     |
|                                  | Other                       | 3,715 (6.3)      | 16,371 (4.5)      |
| Gestational age at delivery      |                             |                  |                   |
|                                  | 37th week                   | 5,050 (8.5)      | 23,685 (6.5)      |
|                                  | 38th week                   | 10,496 (17.7)    | 55,135 (15.1)     |
|                                  | 39th week                   | 17,962 (30.2)    | 108,070 (29.6)    |
|                                  | 40th week                   | 18,657 (31.4)    | 121,615 (33.4)    |
|                                  | 41st week                   | 7,276 (12.2)     | 56,119 (15.4)     |
| Labor type                       |                             |                  |                   |
|                                  | Induction                   | 27,417 (46.1)    | 179,486 (49.2)    |
|                                  | Spontaneous                 | 32,024 (53.9)    | 185,138 (50.8)    |
| Pre-pregnancy BMI                |                             |                  |                   |
|                                  | < 18.5                      | 2,499 (4.2)      | 14,395 (4.0)      |
|                                  | 18.5 - 24.9                 | 21,312 (35.9)    | 162,850 (44.7)    |
|                                  | 25 - 29.9                   | 10,873 (18.3)    | 55,894 (15.3)     |
|                                  | ≥ 30                        | 9,825 (16.5)     | 36,847 (10.1)     |
| Comorbidities                    |                             |                  |                   |
|                                  | Hypertension                | 7,273 (12.2)     | 31,469 (8.6)      |
|                                  | Diabetes                    | 3,003 (5.1)      | 19,950 (5.5)      |
| Birthweight for GA               |                             |                  |                   |
|                                  | Small for gestational age   | 9,822 (16.5)     | 30,149 (8.3)      |
|                                  | Average for gestational age | 46,445 (78.1)    | 298,654 (81.9)    |
|                                  | Large for gestational age   | 3,173 (5.3)      | 35,820 (9.8)      |

Figure 1. Rates of cesarean among various hospital types, settings, and volumes.

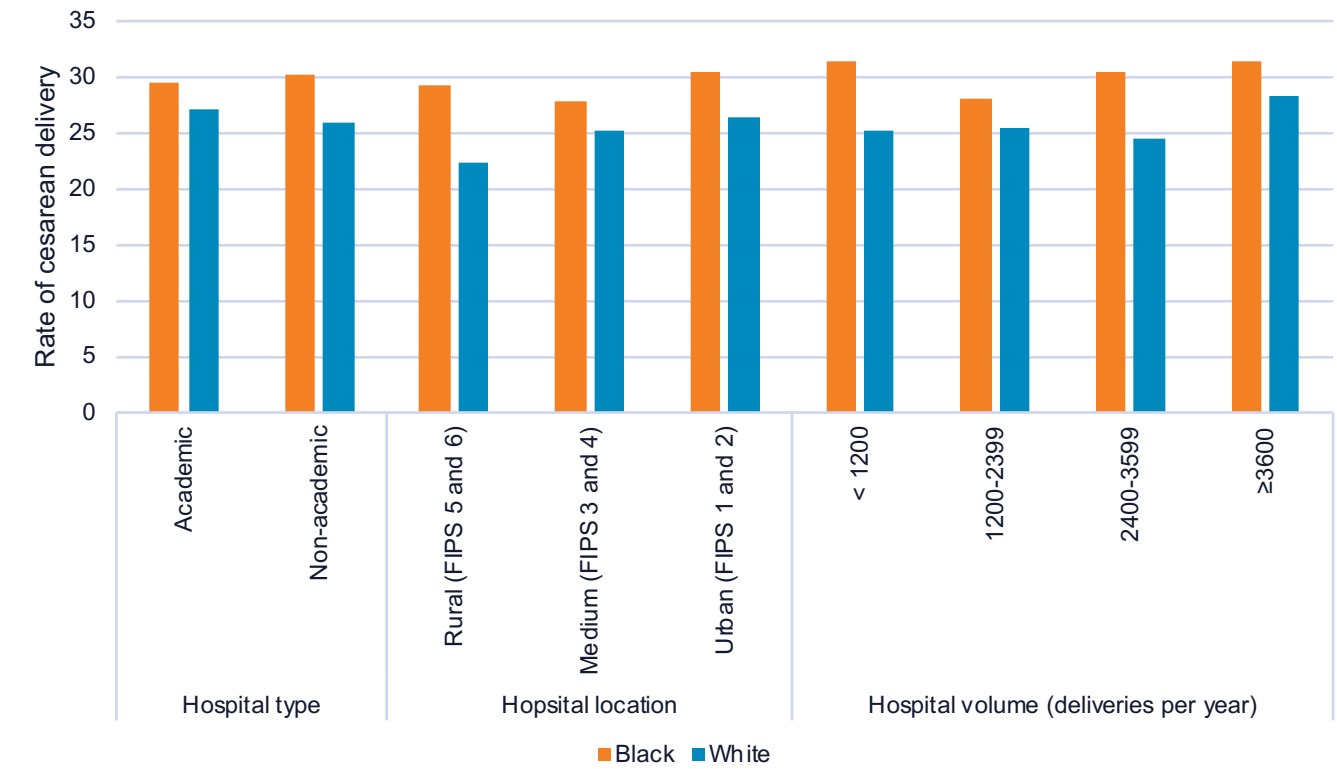


Table 2. Comparing racial differences in cesarean delivery rates by hospital type, setting, and volume.

| Hospital characteristics        |               | Black women<br>n= 59,441 |               | White women<br>n= 364,624 |  |
|---------------------------------|---------------|--------------------------|---------------|---------------------------|--|
| Type                            | n (% CD)      | aRR* (95% CI)            | n (% CD)      | aRR* (95% CI)             |  |
| Academic                        | 2,260 (29.6)  | 1.1 (1.1 - 1.2)          | 8,110 (27.0)  | Reference                 |  |
| Non-academic                    | 15,659 (30.2) | 1.2 (1.2 - 1.2)          | 87,033 (26.0) | Reference                 |  |
| Setting                         | n (% CD)      | aRR* (95% CI)            | n (% CD)      | aRR* (95% CI)             |  |
| Rural (FIPS 5 & 6)              | 26 (29.2)     | 1.4 (0.9 - 2.0)          | 2,635 (22.4)  | Reference                 |  |
| Suburban (FIPS 3 & 4)           | 2,189 (27.8)  | 1.1 (1.1 - 1.2)          | 20,947 (25.3) | Reference                 |  |
| Urban (FIPS 1 & 2)              | 15,592 (30.5) | 1.2 (1.2 - 1.2)          | 70,618 (26.5) | Reference                 |  |
| Volume<br>(deliveries per year) | n (% CD)      | aRR* (95% CI)            | n (% CD)      | aRR* (95% CI)             |  |
| < 1200                          | 1,153 (31.5)  | 1.3 (1.2 - 1.4)          | 12,601 (25.1) | Reference                 |  |
| 1200 - 2399                     | 5,129 (28.1)  | 1.1 (1.1 - 1.2)          | 25,180 (25.5) | Reference                 |  |
| 2400 - 3599                     | 4,695 (30.4)  | 1.3 (1.2 - 1.3)          | 23,272 (24.6) | Reference                 |  |
| ≥ 3600                          | 6,926 (31.5)  | 1.2 (1.1 - 1.2)          | 34,019 (28.2) | Reference                 |  |

\*Adjusted for maternal age, maternal body mass index, medical comorbidities, gestational age, labor type (spontaneous vs induction), and birthweight.