# The Role of Race and Anesthesia on Maternal Health Outcomes

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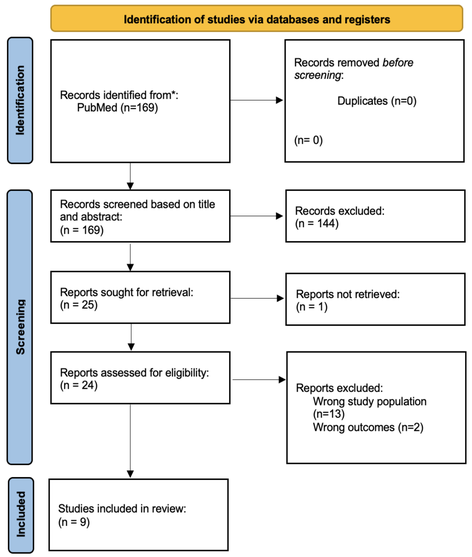
## Background

- Increasing MMM Rates in the U.S.: Maternal morbidity and mortality (MMM) rates have steadily increased in the United States over the past two decades, making it the only developed country with this trend. Approximately 700 women in the U.S. die annually from pregnancy or delivery complications, with 60% of these deaths considered preventable.
- Racial Disparities: Black women in the U.S. experience significantly higher MMM rates compared to white women, highlighting severe disparities in maternal health outcomes.
- Contributing Factors: Maternal health disparities are influenced by a complex interplay of socioeconomic, racial, and clinical factors. Structural racism and implicit clinician biases are major contributors, affecting access to care, education, and clinical decision-making processes.
- Anesthesia and Outcomes: The choice of anesthesia during childbirth—neuraxial versus general—significantly influences maternal and neonatal outcomes. Neuraxial anesthesia, which is preferred due to its safety profile, is less frequently administered to minority populations. This disparity is linked to clinician biases and structural racism in clinical settings.

## Objective

This scoping review aims to evaluate and address these discrepancies to raise awareness and educate healthcare providers to promote equal access to safe and effective obstetric anesthesia practices.

## Methods




## Results

| Reference | Study Design | Data Collection | Study Aim | Findings | Recommendations | Limitations |
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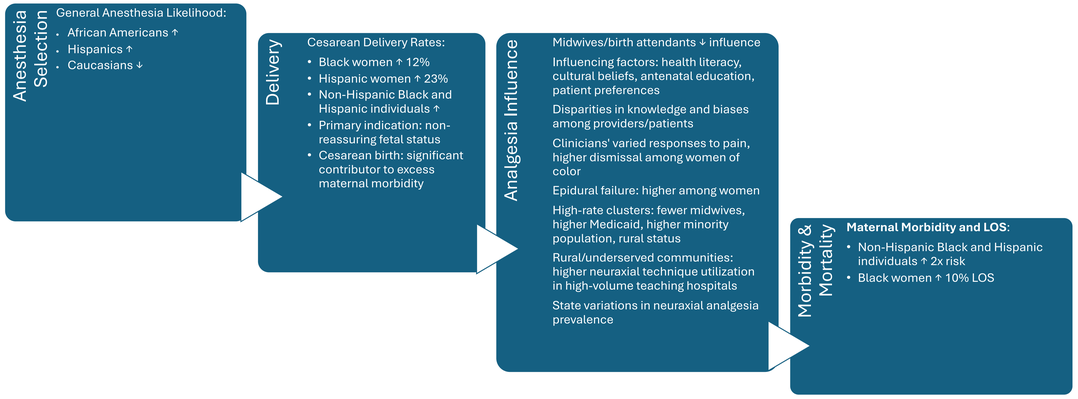
| **Guglielminotti J, et al. (2022)** | Retrospective observational study | (N=575,524) from NY State Inpatient Database (2010-2017) | Investigate the association between labor neuraxial anesthesia and severe maternal morbidity (SMM), particularly postpartum hemorrhage (PPH) | Neuraxial analgesia associated with decreased risk of SMM (adjusted OR 0.86, CI 0.82-0.90); decreased risk of PPH (adjusted OR 0.91, CI 0.88-0.94) | Early evaluation and management of the third stage of labor; continuous intrapartum hemodynamic monitoring; ensuring adequate IV access and fluid resuscitation; continuous availability of obstetric anesthesia team | Observational nature limits causal relationships; no detailed information on type of neuraxial analgesia; exclusions of women requiring intrapartum cesarean delivery; SMM cases after discharge not accounted for |
| **Morris T, Schulman M. (2014)** | Qualitative, in-depth interviews | (N=83) postpartum women in New England tertiary care hospital | Understand relationship between race and epidural use and anesthesia failure in labor | Women of color less likely to plan for epidurals; higher epidural and anesthesia failure rates among women of color | Future research on race and socioeconomic status in medical care; address racial disparities in epidural use and anesthesia failure | Single hospital study; small sample size; recall bias; English-speaking participants only |
| **Butwick AJ, et al. (2016)** | Retrospective observational study | (N=50,974) women who underwent cesarean delivery (1999-2002) | Examine racial/ethnic disparities in use of general vs. neuraxial anesthesia for cesarean delivery (CD) | African-American women had higher odds of receiving general anesthesia (adjusted OR 1.7) | Further research to understand reasons for disparities; ensure equitable access to appropriate anesthesia options | Data from 1999-2002 may limit generalizability; no hospital-level data; reasons for disparities unclear |
| **Butwick AJ, et al. (2018)** | Retrospective population-based, cross-sectional analysis | (N=2,625,950) collected from birth certificates for 100% of US births from 49 states and D.C. covering 96.5% of all births in the United States in 2015. | Examine prevalence and variability of neuraxial analgesia use across states; explore contributing factors | Strongly associated factors: labor augmentation, induction, previous cesarean, absence of prior live births. Inversely associated factors: older age, non-white race, Hispanic ethnicity, lack of private insurance, lower education, late/no prenatal care. | Develop education programs to increase awareness of neuraxial analgesia benefits, especially in low-utilization states | Birth certificate data limitations in accuracy and specificity, particularly for neuraxial analgesia. No hospital-level data, limiting assessment of hospital type and anesthesia provider availability impact |
| **Tangel V, et al. (2019)** | Retrospective analysis | (N=6,872,588) from State Inpatient Databases (2007-2014) | Investigate racial and ethnic disparities in maternal outcomes, delivery types, and length of hospital stay | Black women had 90% increased likelihood of in-hospital mortality; higher cesarean delivery rates for Black and Hispanic women | Further research on disparities; strive for equitable care; optimize quality of care at all delivery hospitals | Administrative data may have coding errors; no multilevel analyses due to model non-convergence |
| **Admon LK, et al. (2018** | Cross-sectional analysis | (N=2,523,528) from National Inpatient Sample (2012-2015) | Define prevalence of chronic conditions and SMM incidence among racial/ethnic groups | Significant disparities in chronic conditions and SMM; Non-Hispanic Black women had higher SMM incidence | Interventions to reduce disparities; improve care quality; implement safety bundles for obstetric hemorrhage; enhance screening for behavioral health conditions | Potential for multiple deliveries by the same woman; wide confidence intervals for rare events; no adjustment for certain obstetric risk factors |
| **Debbink MP, et al. (2022)** | Secondary analysis of randomized trial | (N=6,096) from parent randomized trial | Evaluate association between race/ethnicity and cesarean birth (CD) and maternal morbidity | Higher risk of CD and maternal morbidity for non-Hispanic Black and Hispanic individuals | Address clinician bias and communication; further research on disparities in healthcare delivery; reduce primary cesarean births for low-risk individuals | Small sample sizes for some outcomes; wide confidence intervals; no details on medical decision-making |
| **Howell EA, et al. (2020)** | Population-based cross-sectional design | (N=591,455) deliveries (2010-2014) in NYC | Investigate within-hospital disparities in SMM among racial/ethnic groups and by insurance type | Higher SMM rates for Black and Latina mothers; disparities not explained by insurance type | Address structural racism and bias; optimize care quality; future research in diverse areas | Did not assess unmeasured community and social factors; findings specific to NYC |
| **Vanderlaan J, et al. (2020)** | Retrospective observational study | Data from Georgia Department of Public Health (2008-2012) | Evaluate geographic variation in cesarean delivery (CD) rates and associated county-level characteristics | Significant geographic variation in CD rates; higher rates in rural areas, with fewer providers and more Medicaid births | Improve access to care; investigate factors contributing to disparities; further research on healthcare access | Limited exploration of other healthcare access measures; county-level data limits identification of intra-county clusters |




## Discussions

Contributing Factors to Analgesic Treatment Disparity

1. Access to Neuraxial Anesthesia:
   - Lack of access in vulnerable communities and rural hospitals.
   - Obstetric workforce challenges and closures of rural hospitals, especially in low-income areas with high African American populations.
   - Midwives and other birth attendants less likely to use neuraxial anesthesia compared to physicians.
2. Health Literacy:
   - Cultural differences and lack of health literacy influence anesthesia choices.
   - 58% of black individuals have basic or below basic health literacy compared to 28% of non-Hispanic whites.
   - Low health literacy more common in older adults, adolescents, low-income and low-education individuals, and racial/ethnic minorities.
   - Educational disparities lead to different experiences and pressures in childbirth decisions.
3. Historical Mistrust and Research Misuse:
   - Historical misuse of African Americans in research, such as the Tuskegee Syphilis Study, fosters mistrust in the healthcare system.
   - Mistrust affects health literacy development and patient-physician interactions.
4. Physician Responsibility and Communication:
   - Physicians must provide clear, understandable health information and use translators when necessary.
   - Promoting health literacy can empower patients, particularly pregnant women, to make informed decisions.
5. Improving Health Literacy:
   - Storytelling and culturally appropriate graphics can improve health literacy.
   - User-friendly digital platforms and print materials beneficial for those unfamiliar with technology.
   - Infographics, handouts, and online resources on delivery expectations, anesthesia types, and postpartum life can aid pregnant women.
6. Implicit Bias in Healthcare:
   - Implicit bias among physicians affects healthcare delivery and patient outcomes.
   - Biases include the perception that black individuals have higher pain tolerance.
   - Black and Hispanic patients receive less analgesia in emergency settings compared to white patients.
7. Cultural Competence and Safety:
   - Implementing a "cultural safety" model can address power imbalances and inequalities.
   - Cultural competence training shows some improvement in care quality but limited impact on clinical outcomes.
   - Increasing physician awareness of implicit bias and employing strategies like "individuating" and "perspective-taking" can reduce bias in patient care.

Recommendations

1. Policy and Structural Changes:
   - Increase Medicaid reimbursement rates to sustain obstetric services in rural areas.
   - Offer incentives to healthcare workers to practice in underserved areas.
   - Establish regional partnerships and a "hub and spoke model" for resource sharing.
2. Education and Training:
   - Develop education programs to improve health literacy among minority populations.
   - Provide cultural competence training for healthcare providers.
   - Encourage physicians to use strategies to mitigate implicit bias.

## Conclusion

This review highlights the need for cultural sensitivity in providing neuraxial anesthesia. Key recommendations include cultural training, reducing implicit bias, and patient-centered care. Future research should explore patient preferences, care deviations, and insurance impacts. Addressing ethnic disparities and systemic racism is essential to reduce health disparities and maternal mortality in neuraxial anesthesia.

## References