

OBSTETRICS

Performance of racial and ethnic minority-serving hospitals on delivery-related indicators

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OBJECTIVE: We sought to explore how racial/ethnic minority-serving hospitals perform on 15 delivery-related indicators, and examine whether indicators vary by race/ethnicity within the same type of hospitals.

STUDY DESIGN: We used 2008 through 2011 linked State Inpatient Database and American Hospital Association data from 7 states, and designated hospitals with >50% of deliveries to non-Hispanic white, non-Hispanic black, and Hispanic women as white-, black-, and Hispanic-serving, respectively. We calculated indicator rates per 1000 deliveries by hospital type and, separately, for non-Hispanic white, non-Hispanic black, and Hispanic women within each hospital type. We fitted multivariate Poisson regression models to examine associations between delivery-related indicators and patient and hospital characteristics by hospital type.

RESULTS: White-serving hospitals offer obstetric care to an older and wealthier population than black- or Hispanic-serving hospitals. Rates of the most prevalent indicators examined (complicated

vaginal delivery, complicated cesarean delivery, obstetric trauma) were lowest in Hispanic-serving hospitals. Generally, indicator rates were similar in Hispanic- and white-serving hospitals. Black-serving hospitals performed worse than other hospitals on 12 of 15 indicators. Indicator rates varied greatly by race/ethnicity in white- and Hispanic-serving hospitals, with non-Hispanic blacks having 1.19-3.27 and 1.15-2.68 times higher rates than non-Hispanic whites, respectively, for 11 of 15 indicators. Conversely, there were few indicator rate differences by race/ethnicity in black-serving hospitals, suggesting an overall lower performance of these hospitals compared to white- and Hispanic-serving hospitals.

CONCLUSION: We found considerable differences in delivery-related indicators by hospital type and patients' race/ethnicity. Obstetric care quality measures are needed to track racial/ethnic disparities at the facility and population levels.

Key words: delivery, ethnicity, quality of care, race, United States

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Significant racial and ethnic disparities exist in maternal health in the United States.¹ Compared with non-Hispanic white women, higher proportions of racial/ethnic minority women experience severe pregnancy and delivery complications and death during

pregnancy or in the postpartum period.²⁻⁵ Also, health insurance coverage and utilization of health care are significantly different for racial/ethnic minority women. For example, compared with non-Hispanic white women, non-Hispanic black and

Hispanic women are more likely to be uninsured,⁶ begin prenatal care in the third trimester of pregnancy, or obtain no prenatal care.⁷ The association between being a racial/ethnic minority woman and being uninsured or having publicly funded health insurance may affect how she is treated in medical settings. For instance, evidence suggests that non-Hispanic black women receive substandard prenatal care compared with non-Hispanic white women.⁸⁻¹⁰

Recent research has focused on the site of care as a potential explanation for racial/ethnic disparities in health. Ly et al¹¹ used national Medicare data to evaluate the performance of hospitals on 11 medical and surgical patient safety indicators. They found that primarily black-serving hospitals performed worse than other hospitals on 6 of the 11 indicators, and that, by and large, both white and black patients had higher rates of potential safety events in primarily

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black-serving hospitals than in non-black-serving hospitals. Little is known about potential disparities in the quality of obstetric care offered in US hospitals with different patient population distributions by race/ethnicity. However, with the country becoming more racially and ethnically diverse,¹⁰ examining and understanding these disparities has become a high priority for stakeholders in obstetric care. This analysis aims to explore how racial/ethnic minority-serving hospitals perform on delivery-related indicators with a quality-of-care component, and to examine whether these indicators vary by race/ethnicity within the same type of hospital.

MATERIALS AND METHODS

We used pooled 2008 through 2011 data from Healthcare Cost and Utilization Project's State Inpatient Database (SID) in the 7 US states with >80,000 annual live births (ie, the mean number of 2008 through 2011 births in the 50 US states and District of Columbia) that report race and ethnicity data: Arizona, California, Florida, Michigan, New Jersey, New York, and North Carolina. Of note, 2008 and 2009 data from North Carolina did not include race/ethnicity information, and 2011 data from Arizona, Michigan, New York, and North Carolina were not available at the time of analysis; thus, these state- and year-specific data were not included in the analysis. The SID contains all inpatient discharges in participating states, translated into a uniform set of variables to facilitate multistate comparisons.¹² To obtain data on hospital characteristics, we linked SID and American Hospital Association (AHA) data from 6 of the 7 states (the AHA hospital identifier was missing in the Michigan SID data); the 6-state linkage rate was 99.3%. AHA is a national source of proprietary hospital and health system data collected annually by the AHA.¹³ Because this analysis involved the use of publicly available data lacking direct personal identifiers, the Centers for Disease Control and Prevention Institutional Review Board determined it to be research not involving human subjects.

We identified all delivery hospitalization records using the algorithm developed by Kuklina et al.¹⁴ To identify delivery hospitalization records, this algorithm uses *International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM)* diagnosis codes for delivery outcomes, procedure codes for selected delivery-related procedures, and diagnosis-related group delivery codes. To ensure consistency among states, records were restricted to the first 15 diagnoses and 15 procedures listed. We excluded data from hospitals with <30 deliveries in a given year and where >50% of delivery records lacked data on race/ethnicity, and all records with a missing or invalid value for race/ethnicity. After these exclusions, the sample consisted of 4,456,426 delivery hospitalizations representing 88.9–95.3% of all state- and year-specific births in Arizona, California, Florida, New Jersey, New York, and North Carolina, and 72.3–72.9% of year-specific births in Michigan (Appendix; [Supplementary Table 1](#)). We ranked all hospitals by their proportion of deliveries to non-Hispanic white, non-Hispanic black, and Hispanic women. Hospitals with a majority (>50%) of deliveries to non-Hispanic white women were designated as white-serving hospitals and, similarly, those with a majority of deliveries to non-Hispanic black or Hispanic women were designated as black- or Hispanic-serving, respectively. We identified 1021 white-serving, 56 black-serving, and 530 Hispanic-serving hospitals in the 7 states with a median annual number of 2291, 2922, and 2749 deliveries, respectively ([Table 1](#)). Deliveries in other hospitals (ie, not primarily serving any single racial/ethnic group) represented 32.9% of all deliveries in the sample and were excluded from the analysis.

We examined patient, hospitalization, and hospital characteristics by type of hospital (white-, black-, and Hispanic-serving). The patient characteristics of interest were race/ethnicity (non-Hispanic white, non-Hispanic black, Hispanic, and other); age (<20, 20–34, and ≥35 years); state-level household income quartile for patient ZIP code;

insurance coverage for delivery (Medicaid, private, self-pay, or other); and presence of chronic medical conditions including preexisting diabetes, chronic hypertensive disease, chronic heart disease, chronic respiratory disease, chronic renal disease, chronic liver disease, and human immunodeficiency virus/acquired immune deficiency syndrome (corresponding *ICD-9-CM* codes in [Supplementary Table 2](#)). The hospitalization-related characteristics examined were length of stay (days), time to the first hospital procedure (days), number of diagnoses and procedures during the delivery hospitalization, and proportion of routine hospital discharges. Hospital characteristics of interest were location (urban/rural), teaching status (yes/no), multiple-hospital system membership (yes/no), and ownership (public, private for-profit, private not-for-profit).

Few indicators of obstetric care quality and patient safety exist in the published literature.⁶ Following review of the available published and unpublished literature^{15–25} on proposed obstetric care indicators amenable to assessment using administrative data, we arrived at 15 delivery-related indicators with a quality-of-care component: complicated vaginal delivery, complicated cesarean delivery, obstetric trauma, obstetric wound complications following vaginal delivery, obstetric wound complications following cesarean delivery, uterine rupture among patients with a trial of labor, obstetric thrombosis or embolism, a larger group of postpartum vascular complications including obstetric thrombosis or embolism, peripheral vascular complications and non-thrombotic pulmonary emboli, puerperal infection excluding antepartum infection of amniotic cavity, postpartum urinary tract infection, other obstetric complications (ie, pulmonary, cardiac, central nervous system, anesthesia, shock, major complications of obstetric procedures, acute postpartum renal failure), peripartum hysterectomy among patients with postpartum hemorrhage, puerperal cerebrovascular disorders among patients with hypertensive disorders of pregnancy and

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