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Racial inequities in emergency department wait times for pregnancy-related concerns

Megan E Deichen Hansen, Samantha S Goldfarb, Ariadna Mercouffer, Tyra Dark, Hanna Lateef and Jeffrey S Harman

Abstract

Objective: Emergency department care is common among US pregnant women. Given the increased likelihood of serious and life-threatening pregnancy-related health conditions among Black mothers, timeliness of emergency department care is vital. The objective of this study was to evaluate racial/ethnic variations in emergency department wait times for receiving obstetrical care among a nationally representative population.

Methods: The study used pooled 2016–2018 data from the National Hospital Ambulatory Medical Care Survey, a nationally representative sample of emergency department visits. Regression models were estimated to determine whether emergency department wait time was associated with the race/ethnicity of the perinatal patient. Adjusted models controlled for age, obesity status, insurance type, whether the patient arrived by ambulance, triage status, presence of a patient dashboard, and region.

Results: There were a total of 821 reported pregnancy-related visits in the National Hospital Ambulatory Medical Care Survey sample of emergency department visits. Of those 821 visits, 40.6% were among White women, 27.7% among Black women, and 27.5% among Hispanic women. Mean wait times differed substantially by race/ethnicity. After adjusting for potential confounders, Black women waited 46% longer than White women with emergency department visits for pregnancy problems ($p < .05$). Those reporting another race waited 95% longer for pregnancy problems in the emergency department than White women ($p < .05$).

Conclusion: Findings from this study document significant racial/ethnic differences in wait times for perinatal emergency department care. Although inequities in wait times may emerge across the spectrum of care, documenting the factors influencing racial disparities in wait times are critical to promoting equitable perinatal health outcomes.

Keywords

emergency obstetrics, National Hospital Ambulatory Medical Care Survey, pregnancy, racial inequities

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Race-based disparities in maternal and infant morbidity and mortality are well documented across the United States.[1–6] During pregnancy, Black mothers are more likely to experience serious and life-threatening health conditions, such as hypertension, preeclampsia, and depression, compared to White women.[7–9] Prenatal health risks exacerbate risk for maternal mortality, as well as the risk for infant morbidity and mortality.[10–12] Black women are also less likely to receive appropriate healthcare interventions compared to women of other racial and ethnic backgrounds. Obstetrical emergencies are one of the leading causes of maternal mortality; therefore, inappropriate or delayed care plays an important role in continued race-based disparities in perinatal morbidity and mortality.

Department of Behavioral Sciences and Social Medicine, College of Medicine, Florida State University, Tallahassee, FL, USA

Corresponding author:
Megan E Deichen Hansen, Department of Behavioral Sciences and Social Medicine, College of Medicine, Florida State University, 1115 W Call St, Tallahassee, FL 32304, USA.
Email: megan.deichen@med.fsu.edu

Timely and effective care is hallmarks of the Institute of Medicine's Quality Care Plan.[13] For providers involved in pregnancy-related care, effective obstetrical emergency department (ED) triage is an important component of providing quality care. Triage, the process by which a health provider assesses risk acuity and the urgency of care required, aids in providing timely, efficient, and appropriate care interventions. During pregnancy, the triage process is uniquely complex, given the fragile balance involved in providing assessment, monitoring, and care interventions for both the pregnant mother and her fetus. Rather than providing care on a first-come, first-serve basis, the American College of Obstetricians and Gynecologists (ACOG) recommends that triage be used to prioritize patients with the greatest risk to mitigate potential adverse outcomes for both mother and her child.[14] Once patients' risk acuity is assessed, triage providers are responsible for mobilizing the care teams and resources required for meeting patients' healthcare needs (e.g. hospitalization, referral to outpatient care, in-kind support).

Upward of 6 million obstetrical triage encounters occur across the United States each year.[15] Reasons why women seek ED care are multitudinous and multisystemic. Concerns may be acute in nature, thereby necessitating ED care; however, many women seek care for non-emergent pregnancy concerns. Studies on the general population have found that approximately 25% of ED visits are not in response to clinical emergencies.[16] Reasons for non-emergent ED use among pregnant women include difficulty accessing traditional prenatal care, care concerns that may emerge outside of traditional office hours, and affordability of traditional perinatal care may be unrealistic for women waiting for Medicaid insurance to initiate.[17] In turn, EDs without effective triage procedures may have high provider burden, long wait times, and inequitable provision of services. While standardized triage strategies exist to aid in the appropriate assessment of risk, there has not been sufficient investigation into obstetric wait times and the role of race/ethnicity in influencing the amount of time that elapses between women's arrival at the ED and the time elapsed before they receive care.

Background

ED care is commonly used among US pregnant women. National reports reflect that among women who seek ED care, "problems with pregnancy" was one of the top five reasons for seeking care,[18] and smaller-scale studies cited that 20%–50% of women sought ED care at least once during the pregnancy period.[16,19] Although many women visit EDs for pregnancy-related concerns, women who seek emergency obstetric care are more likely to identify as a racial/ethnic minority, receive Medicaid insurance coverage, and experience behavioral health conditions.[20,21]

Notably, the number of US pregnant women seeking ED care has been growing, despite the reduction in the overall number of EDs nationwide.[22] From 1997 to 2007, ED visits have risen by 23% while the number of EDs has declined by 27% over the past two decades.[22,23] This creates a bottleneck of services in which there are large numbers of women seeking ED care and fewer overall health systems to address women's needs. The decline in the number of EDs across the nation undoubtedly affects the quality and quantity of care given to patients seeking healthcare. Furthermore, this is exacerbated by racial/ethnic disparities in ED wait times, studied extensively in the literature within the general population.

Within the general population, studies have documented racial disparities in ED wait times across care specialties. For instance, a study examining racial/ethnic disparities in ED wait times found that as the severity of the illness decreases, the disparity in wait times for Black patients becomes more apparent. Black patients experienced average wait times of approximately 70 min in comparison to White patients, who experienced average wait times of approximately 50 min.[24] Another study found that Black patients were assigned lower triage acuity scores in comparison to their White counterparts after adjusting for a number of confounding variables, leading to longer wait times for Black patients.[25] A study examining racial/ethnic disparities in ED wait time for patients with mental health and substance-related disorders found that non-Hispanic Blacks experienced longer ED wait times in comparison to non-Hispanic Whites, by 23.4%.[26]

Goals of this investigation

Previous National Hospital Ambulatory Medical Care Survey (NHAMCS) research on nationwide use of ED care suggests the presence of racial/ethnic disparities in extreme wait times within the ED when minoritized patients are not seen immediately, which leads to missed opportunities for quality care and equitable health outcomes across groups and an increased likelihood that patients will leave the ED without being seen.[27] Although many women receive some degree of obstetric care in EDs, to date, there has not been a national evaluation of racial/ethnic variation in wait times for ED care. The purpose of this study is to assess whether disparities exist regarding Black and White women's wait times for receiving obstetrical care within the ED.

Methods

Nature of study

This is a descriptive, cross-sectional study evaluating inequities in ED wait times for patients with pregnancy-related health concerns.

Data source

The study used pooled data from the NHAMCS from 2016 to 2018. NHAMCS is a nationally representative sample of ambulatory care services conducted in hospital EDs by the National Center for Health Statistics. A four-stage probability sampling design is used to collect a national sample of visits to EDs in non-institutional general and short-stay hospitals, excluding Federal, Military, and Veterans Administration hospitals. This design includes data from 550 EDs across the United States. The National Center for Health Statistics has previously reported a detailed description of the NHAMCS methodology.[28] Across sites, NHAMCS collects information on individual patients (age, sex, race, ethnicity), visits (provider's diagnosis, services ordered/provided, treatments including medication), and facility characteristics. This is a de-identified public data set, and therefore, this study is exempt from the Institutional Review Board (IRB) approval; however, the survey methods used in the collection of original NHAMCS data were reviewed and approved by the National Center for Health Statistics' Ethics Review Board (ERB).[29] The ERB documentation waives the need for additional IRB review at participating hospital sites.[29]

Study participants

This study includes all patients in the NHAMCS data set who accessed an ED for pregnancy-related concerns from 2016 to 2018. No patients were excluded from the analysis if they met these initial criteria.

Measures

ED wait time (outcome variable). The number of minutes that women waited in the emergency room before being seen was recorded.

Race (predictor variable). Patient race was recorded as non-Hispanic White, non-Hispanic Black, Hispanic, or Other (Asian, Pacific Islander, Native American, or More than One Race).

Pregnancy concerns (predictor variable). ED visits for pregnancy concerns were identified using the patient reason for visit codes. Patient records in the NHAMCS database report up to three of the patient's reasons for visit. All visits that listed one of the following reasons for visit codes were used to identify visits for pregnancy concerns: 1790.0 (problems during pregnancy), 1790.1 (pain during pregnancy), 1790.2 (bleeding during pregnancy), and 2735.0 (diagnosed complications with pregnancy).

Control variables. Adjusted analyses controlled for patient age, obesity status (yes/no), insurance status (private, Medicaid, Medicare, uninsured, other), arrival by ambulance (yes/no), triage level (high, mid, low, missing, none), presence of a patient dashboard in the ED (yes/no), and region (Northeast, South, Midwest, West).

Analyses

The models were estimated using random-effects generalized least squares regression that account for correlation of observations over time. We conducted generalized linear models using gamma family and log link functions. These models were chosen due to the non-normal error terms in the distribution. The Gamma family function was selected to allow the model to be more flexible, and the log link function resulted in error terms that approximated a normal distribution. The sampling weights provided by NHAMCS were used in conjunction with the survey procedures of Stata 15.0 to allow for the complex sampling design. Weights were used to allow for results to be nationally representative. Weights additionally account for clustering within EDs related to standard errors.

Results

Characteristics of the study sample

There were a total of 821 reported pregnancy-related events in the NHAMCS sample of ER visits between 2016 and 2018. Of these visits, 276 (33.6%) occurred in 2016, 233 (28.4%) in 2017, and 312 (38%) in 2018. Of those 821 events, 333 (40.6%) were among White women, 227 (27.7%) among Black women, 226 (27.5%) among Hispanic women, and 35 (4.3%) among women whose race was reported as something other than Black or White. Table 1 reports the demographics of this population for whom pregnancy problem events were reported.

Table 2 reports the mean wait time (in min) that patients with pregnancy problems waited in the ER before being seen. After applying the NHAMCS sample weights, the mean wait time for women overall was about 39 min. When broken out by race, the mean wait times differed substantially. White women had the lowest mean wait time at about 33 min, followed by Black and Hispanic women (~45 min for both) and women of another race (52 min).

Main results

The unadjusted analyses found that Black women with ED visits for pregnancy problems waited 37% longer than White women with ED visits for pregnancy problems ($p < .10$; see Table 3). In addition, those reporting other race waited 59% longer for pregnancy problems in the ED than White women ($p < .05$).

After adjusting for covariates (insurance type, year, arrival by ambulance, and triage level), Black women with

Table 1. Characteristics of patients reporting pregnancy problems in the NHAMCS sample of ER visits, 2016–2018.

Category	Number (N = 821)	Percent
Race		
White	333	40.6
Black	227	27.7
Hispanic	226	27.5
Other	35	4.3
Insurance type		
Private	213	25.9
Medicare	5	0.6
Medicaid	441	53.7
Uninsured	89	10.8
Other	73	8.9
Ambulance		
Yes	71	8.7
No	750	91.3
Triage level		
High	57	6.9
Medium	367	44.7
Low	115	14.0
Missing	215	26.2
None	67	8.2

Table 2. Mean wait times of patients reporting pregnancy problems in the ER, 2016–2018.

	Mean (95% CI)
Overall—weighted	39.3 (32.3–46.2)
Race—weighted	
White	32.6 (24.7–40.6)
Black	44.7 (33.0–56.4)
Hispanic	45.4 (30.1–60.7)
Other	52.0 (31.1–72.9)

CI: confidence interval.

Table 3. Unadjusted and adjusted regression on mean ED wait times for pregnancy problems by race/ethnicity.

	Coefficient (95% CI)	p-value
Unadjusted		
White	Reference	
Black	0.31 (−0.02 to 0.65)*	0.068
Hispanic	0.33 (−0.06 to 0.72)	0.101
Other	0.47 (0.00 to 0.93)**	0.048
Adjusted[a]		
White	Reference	
Black	0.38 (0.05 to 0.71)**	0.023
Hispanic	0.25 (−0.11 to 0.60)	0.171
Other	0.67 (0.15 to 1.19)**	0.011

CI: confidence interval.
[a]Adjusted for patient age, obesity status, insurance type, year, arrival by ambulance, triage level, presence of a patient dashboard in the ED, and region.
*$p < .10$; **$p < .05$.

ED visits for pregnancy problems were significantly more likely to wait (46% longer) than White women with ED visits for pregnancy problems ($p < .05$). In addition, women of another race with ED visits for pregnancy problems were significantly more likely to wait (95% longer) than White women with ED visits for pregnancy problems ($p < .05$). Note that because this analysis includes dichotomous variables, effect sizes are calculated by exponentiating the coefficients and subtracting from one to get the percent difference. There were no other statistically significant differences in mean wait time by race or ethnicity.

Discussion

This study sought to explore racial/ethnic differences in ED wait times for women seeking care for pregnancy-related concerns. While racial inequities in ED wait times have previously been reported in the general population, wait times among individuals seeking care for pregnancy concerns have been largely overlooked.[30] Because of the complicated triage process involved in determining patient acuity and the well-documented disparities in maternal and infant morbidity and mortality, specific inquiry into the influence that race plays in predicting ED wait times is important.

Using the NHAMCS data, this study identified racial disparities in obstetrics-related ED wait times. Specifically, adjusted analyses identified that non-Hispanic Black women waited approximately 46% longer for emergency obstetrics care, compared to non-Hispanic White women, when controlling for other demographic factors. This study's findings provide a new lens through which we can understand systemic inequities, and mirror racial inequities that have been widely documented within the field of maternity care.[31–33] For example, Black perinatal women's mortality rate is three to four times that of their White peers. Black women are also nearly twice as likely to experience pregnancy-related health complications.[32] In this light, racial inequities in wait times for obstetric ED care are of serious concern, given the existing evidence linking extended wait times/delays in care with increased odds of morbidity and mortality.[25,34]

Not only do prolonged wait times increase the risk that Black women's health needs are not addressed in a timely and equitable manner, but they also increase the risk that women will leave the ED prior to receiving care.[27] When women do not receive care related to their presenting complaints, women's perinatal health issues may go undetected and unaddressed. Women's unaddressed health concerns can be costly, both in terms of the increased odds of morbidity and mortality, but also due to the increased likelihood of return visits for care.[35] One way that hospitals aim

to mitigate biases in emergency care prioritization is through the implementation of standardized tools for risk acuity assessment. Although acuity of care triage assessments have the potential for mitigating racial disparities in wait times, this study highlights the persistence of race-based differences, even when acuity of care measures has been implemented.[25]

Possible explanations for inequities in wait times can emerge across the spectrum of care. For example, differences in wait times may be influenced by patients' expression of health-related concerns and their perception of perinatal risk, types of patient care preferences, and individual biases that influence subsequent provider interventions.[36] Although differences in ED wait times for perinatal care can be attributed to events occurring at any one of these time points, providers' approach to triage and intervention may be especially important in mitigating disparities in ED wait times. One recent study that examined gaps in preventing maternal mortality and morbidity attributed inappropriate provider intervention (i.e. failure to appropriately diagnose, delayed intervention, or failure to provide appropriate care referrals) to 90% of the preventable cases of maternal morbidity and mortality.[37] This indicates that provider decision-making is a critical component of enhancing perinatal care outcomes.

Provider bias, whether conscious or unconscious, may influence the amount of time patients wait for care. Previous research has shown that when providers are under a greater degree of stress, individual biases play a more influential role in decision-making processes.[38] Obstetrics emergency care is fast-paced and given that EDs are often a de facto care environment for patients with limited care accessibility or whose needs are considered too risky to care for in office-based settings, ED providers can become quickly overburdened putting them at risk for missed care opportunities. As such, further investigation into the role that providers play in influencing racial disparities in ED wait times is critical to mitigating preventable illness and death among Black women seeking ED care for pregnancy-related concerns.

Likewise, it is possible that the observed racial differences are also influenced by systemic issues, such as available community resources, structural and organization characteristics within hospital settings, and the standard processes involved in provision of clinical care. Previous research has identified systematic differences in care among hospitals that primarily serve Black patient populations. Non-Hispanic Black patients are more likely to receive care at lower quality hospitals compared to Non-Hispanic White patients, and this trend may contribute to inequities in patients' ED wait times.[36] This has important implications for care outcomes and for the interventions which emerge as a result of these findings. A recent review further indicated that Black patients are more likely to receive care at hospitals that do not routinely implement appropriate care strategies, and thus may result in delayed care.[4] Considering that this study's analyses controlled for insurance type, risk acuity, and method of hospital arrival, study findings suggest evidence of systemic issues of injustice. As such, future research should more closely explore the role that structural factors specifically play in predicting racial differences in wait times for obstetric ED care.

Implications

This study's findings have important implications for perinatal medicine and health services research. Moving forward, future research should explore trainings related to racial bias and racial inequities in emergency perinatal care provision as well as strategies for enhancing equitability in triaging perinatal patients' acuity of care, both within emergency care settings, and within outpatient offices from which patients may be referred to the ED.[16] This research should include a qualitative exploration of women's perceptions of their perinatal care to best understand their needs and experiences. Through this qualitative investigation, it is likely that we will identify enhanced strategies for promoting communication between patients and their emergency and perinatal health providers.

Likewise, in order to best understand how women navigate perinatal health concerns, more granular, system-level analyses are required. Understanding patterns of resource availability and accessibility is a critical component of advancing the field of perinatal heath equity. For instance, it may be that there are differences in wait times for women based on whether or not they have an established prenatal care provider. This has important implications, particularly among Medicaid recipients, given that women are less likely to initiate prenatal care promptly if they do not have sufficient health insurance coverage. Furthermore, the role of the number of available EDs, ED quality, and ED capacity should also be examined to assess whether differences in wait times are partly due to differences in ED supply and composition in EDs that predominantly serve Black patients. Additional and related downstream issues, such as inequities of ED departure prior to treatment, should also continue to be investigated, and systemic differences should be called to light.

Finally, because some patients' risk acuity may allow for care within office-based health settings (e.g. patients with a need for anxiety-related interventions; patients with high blood pressure; patients with mild bleeding; or patients who have concerns related to fetal movement), future work should explore approaches, such as health navigation, for facilitating appropriate help-seeking strategies among pregnant women that may better suit their healthcare needs.[20]

Limitations

This study has several limitations that should be considered when interpreting the results. NHAMCS data are based on retrospective chart reviews; thus, it may be subject to errors in the medical record or errors during chart abstraction. In addition, the study is limited to ED visits by women presenting with pregnancy concerns, which were identified using NHAMCS reason for visit codes. It is possible that some women with pregnancy concerns did not express a reason for visit that met our inclusion criteria and were thus not included in the sample. Finally, despite pooling several years of data, some of the subgroup estimates relied on relatively small sample sizes and should be interpreted with caution. Although women categorized as "other race" had significantly longer wait times than White women, this result is difficult to interpret given that multiple racial/ethnic groups are included in this category. Notably, although no power analysis was conducted, NHAMCS requires a minimum of 30 visits in every category to maintain a stable estimate, and this was achieved within this study. Our main finding was statistically significant, indicating sufficient power.

Conclusion

This study's findings contribute significantly to the overall knowledgebase of emergency obstetrics medicine in several ways. First, this study is the first of its kind to focus on racial disparities in perinatal ED care. Although existing studies have identified race-based differences in emergency perinatal care, existing studies involve restrictive samples that do not allow for a nationally representative understanding of perinatal ED trends. Implementing data with a large, nationally representative sample is essential to more fully understand the factors that can influence equitable perinatal ED care. Findings from this study document significant, racial/ethnic differences in wait times for perinatal ED care and call for a more detailed investigation of the factors influencing disparate wait times among pregnant women. Documenting and investigating the root causes of racial disparities in wait times are critical to promoting equitable perinatal health outcomes, particularly in light of the stark disparities in maternal and infant morbidity and mortality within the United States. Without proper and timely ED care, disparities may be sustained, and further economically burden the healthcare system.

Declarations

Ethics approval and consent to participate

Not applicable because no primary data were collected.

Consent for publication

Not applicable.

Author contribution(s)

Megan E Deichen Hansen: Conceptualization; Investigation; Methodology; Resources; Supervision; Writing – original draft; Writing – review & editing.
Samantha S Goldfarb: Conceptualization; Methodology; Visualization; Writing – original draft; Writing – review & editing.
Ariadna Mercouffer: Conceptualization; Resources; Writing – original draft.
Tyra Dark: Conceptualization; Writing – original draft; Writing – review & editing.
Hanna Lateef: Conceptualization; Resources; Writing – review & editing.
Jeffrey S Harman: Data curation; Formal analysis; Investigation; Methodology; Writing – review & editing.

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Competing interests

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Availability of data and materials

Data from this study are publicly available at https://www.cdc.gov/nchs/ahcd/datasets_documentation_related.htm.

ORCID iD

Megan E Deichen Hansen https://orcid.org/0000-0001-8930-8930

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