VARIATIONS IN LABOR AND DELIVERY CHARACTERISTICS AND PREGNANCY COMPLICATIONS BY DETAILED MATERNAL NATIVITY WITHIN THE UNITED STATES BLACK DIASPORA

by

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ABSTRACT

FARIDA N.B. YADA. Variations in labor and delivery characteristics and pregnancy complications by detailed maternal nativity within the United States Black Diaspora. (Under the direction of DR. CANDACE S. BROWN and DR. LARISSA R. BRUNNER HUBER)

Black people comprise a diverse range of nationalities, cultures, experiences, and perspectives, and therefore, cannot be considered a monolith. The Black-White maternal disparities, and differences in birth outcomes between US-born and foreign-born Latina and Asian women have been extensively documented. Black immigrants account for 10% of the total Black population in the United States (US) and have the highest birth rates of all immigrant groups in the country. Research focusing on the reproductive health of these populations is currently limited. Previous research has shown that foreign-born status has generally been associated with a reduced likelihood of adverse birth outcomes including low birthweight, preterm birth, and small for gestational age however, the pathways for the observed associations are yet to be fully understood. Most importantly, the majority of previous findings were not stratified by detailed maternal nativity (DMN).

To address this research gap, this dissertation presents three studies seeking to provide an overview of variations in labor and delivery (L&D) care and pregnancy complications among Black women within the Black US Diaspora. The author defined DMN as the mother's place of birth (i.e., US or not) and the mother's specific country of birth. The first study was a systematic scoping review which utilized the Andersen Behavioral Model of Health Services Use as a framework to understand the contextual and individual characteristics associated with the access, utilization, and experiences of L&D care services among Black women in the US. The review included 27 articles which focused on issues including structural inequities, severe maternal morbidity, pregnancy complications, maternal death, birth plan decision-making, and alternative birthing methods. Only three out of 27 articles examined foreign-born women's L&D experiences. These findings served as foundation informing the other two studies.

The second and third studies used 2016-2020 Natality Birth Certificate Record Data to explore L&D characteristics and pregnancy complications among US-born, Caribbean-born and Sub-Sharan-

African-born (SSA) Black women in the US. The second study examined associations between DMN and the following L&D characteristics: type of attendant at birth (i.e., physician or midwife) the place (i.e., health care facility or home), and the method of delivery (i.e., vaginal or cesarean). The findings revealed differences in L&D characteristics between US-born, Caribbean-born and SSA-born Black women and suggested the need for more research and healthcare policies that consider the specific needs and preferences of different groups of pregnant women based on their ethnocultural origins.

The third study evaluated the relationship between DMN and three of the most prevalent pregnancy complications among Black women, gestational hypertension, eclampsia, and gestational diabetes. Consistent with prior studies, foreign-born Black women in the sample exhibited lower odds of gestational hypertension and eclampsia, but higher odds of gestational diabetes compared to US-born Black women.

The collective findings of the present dissertation underscore the necessity of recognizing the heterogeneity within the Black Diaspora, highlighting the need for more granular data collection and analysis methods. Additionally, policies to increase access to quality care, cultural competence, interdisciplinary collaboration among maternity care providers and patient-centered L&D services are paramount to eradicate the reproductive inequities and adverse birth outcomes experienced by women across the Black Diaspora.

Keywords: Detailed maternal nativity, Black women, Black Diaspora, US-born, Caribbean-born, Sub-Saharan African-born, labor and delivery, birth attendant, place of delivery, method of delivery, pregnancy complications, gestational hypertension, eclampsia, gestational diabetes.

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LIST OF ABBREVIATIONS

FNY	Farida N. YADA
KLR	Kandice Reilly-Lacci
L&D	Labor and Delivery
PI	Primary investigator

CHAPTER ONE: INTRODUCTION

Black people are not a homogenous group. With the continuing rise of immigration to the United States (US) from Black nations, heterogeneity in the Black diaspora is also increasing. The term, 'US-Born Black people,' refers to all Black people who were born in the US and are either descendants of enslaved people or born to immigrant parents. The two main regions contributing to the rising Black immigrant population in the US are the Caribbean and sub-Saharan Africa (SSA).[1–3] Although US-born and foreign-born Black people share a racial status, they often have different ethnicities, cultures, and practices that impact their health profiles.[4] For these reasons, this dissertation focused on US-born Black people, Black immigrants born in the Caribbean and sub-Saharan Africa, and birthing in the US.

Immigration

Culture, ethnicity, and immigration characteristics must be considered in the study of Black People's reproductive health. In 2019, 47 million people in the US identified as Black, making up 14% of the total US population among which 4.6 million were foreign-born.1 Among Black immigrants in the US, those who identify as Caribbean (46%) are the largest group, while Sub-Saharan Africans (42%) account for the fastest growth in the US Black immigrant population.5,6 Regardless of race, immigrant women generally have a higher fertility rate (77.4 per 1,000 live births) compared to their US-born counterparts (56.2 per 1,000 live births).5,6 In 2016, SSA immigrant women accounted for 5% of all live births in the US and with the highest birth rate among all immigrant groups (106.4 births/1,000 women aged 15-44 years), have incurred a 246% population increase between 2000 and 2019.2,7

The key immigration pathways to the US for Caribbean immigrants date back to the early 1900s, when the US had control over most Caribbean nations, except Jamaica, and hired Caribbean workers to build the Panama Canal to fulfill important healthcare and agricultural jobs.8 Immigration from SSA started rising in the US after The Immigration and Nationality Act of 1965 removed previous immigration legislation which granted citizenship for immigrants from western European nations. Additionally, the Refugee Act of 1980, and the 1990 Immigration Act increased opportunities for Africans to seek asylum

in the US as economic, civil, and political instabilities submerged the African continent.[8] The 1990 Immigration Act also introduced the Diversity Visa Program to increase the immigration of students and skilled workers from African countries including Benin, Cameroon, Ghana, Kenya South Africa, and Nigeria.[9] Today, other immigration pathways to the US, from the Caribbean and SSA, include reuniting with family members who live in the US, and education.[8]

Certain Caribbean immigrants often obtain lawful permanent residence in the US through family reunification programs, such as the Cuban Family Reunification Parole Program (CFRPP). In 1966 The Cuban Adjustment Act provided admission or parole into the US as a direct pathway to legal permanent residency and work authorization while awaiting green cards after only 12 months. By the mid-nineties, the US-Cuba Migration Accords commonly dubbed the "wet foot, dry foot" policy further placed Cuban immigrants at an advantage by enabling all Cuban immigrants who reached US territory to apply for legal status regardless of their visa status.[8] Although the policy now only allows eligible US citizens and/or green card holders to apply for parole for their relatives in Cuba, CFRPP led to large increases in the US Cuban population over the last six decades and continues to be the only fast-track immigration integration program of its type for a particular country.[8]

Haitians, the second largest Black Caribbean immigrant group, do not have the same access to such favorable pathways as their Cuban counterparts.[8] Some Haitians, who do not have work authorization, are granted Temporary Protected Status (TPS), which allows them to remain in the US due to the 2010 earthquake which killed over 300,000 Haitians; and, the ongoing armed conflict further destabilizing Haiti.[8] In 2021, there were 155,000 Haitians estimated to be eligible for TPS.[8] Cuba and Haiti share similarities such as governments with documented human rights violations and histories of seeking asylum in the US by way of boat.[10] Policy analysts have pointed out that although US immigration laws should be neutral, Cuban immigrants who predominantly identify as White have a clear advantage over their Haitian counterparts.[10] These discrepancies in immigration policy point to the anti-Black sentiment stemming from systemic racism in the US.[10,11]

In 2020, approximately 11,200 Caribbean and 39,000 SSA international students enrolled in US

higher education institutions in the US.[8,12] The origin countries with the highest numbers of international students were Jamaica, the Bahamas, and the Dominican Republic for the Caribbean, and Nigeria, Ghana, and Kenya for SSA.[8,12] Many international students transition into the US labor market, and/or become legal permanent residents then naturalized US citizens after their studies.[13] The latter means that international students, including those who remain in the US, post-graduation, and start families also contribute to US birth rates. Notwithstanding their contributions to the growing US-Black population, Caribbean and Sub-Saharan African immigrant women are underrepresented in current reproductive research and scientific literature.

Maternal Health in the Black Diaspora

In terms of reproductive outcomes, past studies have documented that foreign-born Black mothers, including those from the Caribbean and SSA, experience lower prevalence of low birthweight, preterm birth, small for gestational age, and an increased length of gestation compared to US-born Black women.[14–16] This protective effect varies across racial and ethnic groups and by education level, with stronger protective effects observed among Black, Hispanic, and White immigrant mothers with lower educational attainment.[17] A 2021 study of trends and social inequalities in US maternal mortality between 1969-2018 revealed that, overall, immigrant mothers had 38% lower mortality rates than their US-born counterparts.[18] Compared to US-born mothers, Black and White immigrant mothers had 33% and 49% lower mortality rates, respectively.[18] Although foreign-born status has been associated with a reduced likelihood of adverse birth outcomes for Black immigrant mothers and infants, the pathways for the observed associations are yet to be fully understood.

Labor and Delivery Characteristics

Despite being a high-income country with top-tier medical training and workforce, the US ranks highest in maternal morbidity and mortality among high-income countries.[19] Having skilled birthing attendants/healthcare providers present at delivery has been associated with reduced mortality for both mothers and infants and has long been considered a key indicator for monitoring maternal and newborn health by the World Health Organization (WHO).[20] Skilled birth attendants (SBA) are maternal and

newborn health professionals including obstetricians, pediatricians, midwives, nurses, and anesthetists who are educated, trained, and regulated to national and international standards. SBA competencies include 1) providing and, promoting evidence-based, human-rights-based, quality, socioculturally sensitive, and dignified care to women and newborns; 2) facilitating physiological processes during labor and delivery ensuring a clean and positive childbirth experience; and 3) identifying and managing or referring women and/or newborns with complications.[21] As part of the maternal and newborn health team, midwives trained to International Confederation of Midwives (ICM), standards can provide almost all the necessary care for mothers and newborns. In the US, midwifery services include sexual and reproductive health care (i.e., family planning and preconception care), pregnancy care, labor and delivery (L&D), postpartum care, and primary care for infants up to 28 days after birth. Midwifery care services also include health promotion, risk assessment, disease prevention and management for individuals and/or families in various settings such as hospitals, community clinics, private offices, public health systems, birth centers, telehealth, and personalized care in homes.[22]

According to The American College of Obstetricians and Gynecologists (ACOG), the safest places of delivery are hospitals and birth centers.[23] However, there has been a steady rise in planned home births in the US since the early 2000s.[34] Studies have revealed that the place of delivery (home versus in-facility), is also a significant factor associated with maternal and neonatal morbidity and mortality.[23,24] In the Black US birthing population, there has been a 76% increase in birth center and home births since 2004.[25] This rate increased again during the COVID-19 pandemic due to Black mothers' quest for safer L&D experiences that would not lead to adverse birth outcomes or end in death. [26] The number of birth center locations is not evenly distributed throughout the US, with states such as New Hampshire and Pennsylvania reporting more than 1% birth center births, while Midwestern and Southern states, where most Black US residents live, report birth center birth rates below 0.16%.[27]

Despite subjecting birthing women to the inherent risks associated with surgical procedures, including maternal morbidity (i.e., infections, hysterectomy),[28,29] mortality [30] and adverse neonatal outcomes (i.e., respiratory distress syndrome, and neonatal intensive care unit admission), [31] cesarean

deliveries are the most common procedures for women in the US. [27] Non-Hispanic Black mothers have 5% greater rates of cesarean deliveries when compared to Asian, Hispanic, or White women; the higher cesarean delivery rates among Black women include those without medical indication.[27,32,33] However, the extent of the role racial disparities in the method of delivery (i.e., vaginal or cesarean) play in the Black maternal morbidity and mortality rate is still inconclusive.[34]

Barriers to Care

Black mothers with differing ethnocultural backgrounds in the US face numerous individual and sociostructural barriers to accessing adequate and supportive maternity care services. For all Black mothers, such barriers include systemic and obstetric racism, maternity care deserts, access to transportation, childcare, health insurance, socioeconomic status, community resources such as social support, and culturally appropriate sources of care. For Black immigrant mothers, these barriers also include English proficiency, immigration status, and fear of deportation.[35,36]

Racial and ethnic discrimination are the primary socio-structural contributors to health disparities in the US. Despite the healthy migrant effect, Black immigrants have a higher risk for adverse birth outcomes, yet underuse reproductive health services.[37] In general immigrant women are less likely to have health insurance, a primary source of care, and receive preventive care such as women wellness exams including pap smears.[37–39] For example, in a 2017 qualitative study of perspectives on gynecological care among Congolese and Somali immigrants in Massachusetts (n= 31), most participants indicated that they did not feel that seeking care outside of the pregnancy context or in the absence of pain was necessary.[37] Additionally larger proportion of non-Hispanic Asian, Black, and White immigrant women, including those who reside in health/ maternity care deserts, lack health insurance and utilize reproductive health services at lower rates than US-born women.[40]

A maternity care desert is defined as a county that has no hospital offering obstetric care, no birth center, and no obstetric provider.[41] Such counties have higher poverty rates and lower median household incomes than counties with access to maternity care. Of the 500,000 live births every year in the US, 10% of them occur in counties with limited access to maternity care services.[41] Of the five million women of

reproductive age in the US living in maternity care deserts, one in three of them live in urban or large metropolitan areas. In 2017, approximately 150,000 infants were born to mothers living in maternity care deserts, and 514,000 were born in rural areas, but of all obstetric providers practicing in the US, a meager eight percent report practicing in rural areas.[41]

Gestational Hypertension, Eclampsia, & Gestational Diabetes

The most common pregnancy complications worldwide are hypertensive disorders including gestational hypertension and eclampsia.[42] Women with hypertensive disorders during pregnancy have a greater risk of prolonged labor, induced labor, cesarean delivery, postpartum depression, and of developing hypertension, stroke, cardiovascular disease diabetes later in life.[43,44] Gestational hypertension is defined as elevated blood pressure (≥ 140 / ≥90 mmHg) which develops in previously normotensive biological women after the 20th week of pregnancy, without proteinuria (protein presence in urine).[44] Gestational hypertension is confirmed when the blood pressure returns to normal after pregnancy.[44] Women with gestational hypertension are at high risk for developing preeclampsia which is hypertension that occurs after the 20th week of gestation but with at least 300 mg of proteinuria every 24 hours.[44]

Eclampsia is the more severe and final form of preeclampsia and can result in seizures convulsions and maternal death late in pregnancy or postpartum.[43] Studies of disparities in gestational hypertension have revealed that Black immigrants tend to have lower odds of gestational hypertension and eclampsia than their US-born counterparts however, these odds have not been examined by maternal country of birth.[43,45,46] Gestational diabetes mellitus is defined as glucose intolerance that first occurs during pregnancy and affects 6% of all pregnancies in the US.[47] Women with gestational diabetes are 10 times more likely to develop type 2 diabetes mellitus later in life and have a 68% increased risk of cardiovascular disease compared to women who do not develop gestational diabetes.[47] Unlike with hypertensive disorders in pregnancy, foreign-born Black women have been known to have higher odds of having gestational diabetes than their US-born counterparts.[47–52] More interestingly, research has shown that foreign-born Black women that have resided in the US for less than 10 years have a higher prevalence of gestational diabetes than those who resided in the US for more than 10 years with the

lowest prevalence of gestational diabetes among US-born Black women. [46] These findings though insightful are not stratified by maternal country of birth.

Purpose

The relationship between maternal nativity and L&D characteristics such as the type of birth attendant, place (i.e., facility, or home), and method of delivery (vaginal vs cesarean) remains insufficiently explored for the Black women of diverse origins living in the US. Most studies examining access and utilization of sexual and reproductive services and the related outcomes do not distinguish between Black foreign-born racial/ethnic groups and their US-born counterparts or by foreign-born country of birth.[53] The limited number of studies examining variations in L&D characteristics and their relationship to birth outcomes by mother's country of birth mainly focus on infant outcomes such as preterm births, small for gestational age, and low birth weight.[15,53,54] However, they did not account for the country of birth, which may be a substantial factor in findings because of the heterogeneity within the Black diaspora.

This dissertation aimed to first identify existing research gaps in the knowledge about Black women's access, utilization, and lived experiences of L&D care services in the US. There is currently insufficient knowledge concerning differences in the following L&D characteristics: type of attendant at birth (i.e., physician or midwife) the place (i.e., health care facility or home), and the method of delivery (i.e., vaginal or cesarean) for Black mothers in the US. These characteristics are expected to vary by maternal country of birth; thus, the second aim of this dissertation was to examine associations between detailed maternal nativity (DMN) (i.e., specific country of birth), and L&D characteristics. The third aim was to examine the associations between DMN and select pregnancy complications of Black mothers in the 2016-2020 Natality Birth Certificate Record Data who were born in the US, the Caribbean, or SSA.[55,56] The author defined DMN as the mother's place of birth (i.e., US or not) and the mother's specific country of birth. The pregnancy outcomes of interest examined the following pregnancy complications: gestational hypertension, eclampsia, and gestational diabetes.

Conceptual Framework and Social Determinants of Health

The Andersen Behavioral Model of Health Services Use places an emphasis on improving access to healthcare services by examining the various contextual and individual characteristics that influence the use of these services.[57,58] Specifically, these factors can be divided into predisposing factors (that predispose individuals to seek care), enabling factors (that increase or hinder the use of care), need factors (an individual's need for care), and personal health practices. (lifestyle practices, and the use of formal healthcare services).[57] The model aims to identify and address barriers to healthcare access by understanding the complex interplay between these different factors.[57]

For the purposes of this dissertation, the predisposing contextual factor of interest that can affect access and utilization of L&D characteristics was the state/ region of residence in the US.[59,60] Predisposing individual factors, known to influence L&D characteristics, included in the present study were demographics such as nativity status, nationality, marital status, age, education, parity, and biomedical risk factors including gestational weight gain and previous cesarean deliveries.[61,62,63] Predisposing individual factors that were not assessed due to data limitations include employment status, English language proficiency, and immigration status (e.g., migrant, refugee, asylum seeker, etc.).[61,62] The predisposing health behavior and practice known to influence one's access and utilization of L&D services assessed in this study was prenatal care.[53]

Enabling contextual factors assessed in the present study included the location (i.e., urban or rural) and US region of residence.[41] At the individual level, enabling factors include insurance status and type. For the purposes of this dissertation, the need characteristics of interest associated with L&D care were the prevalence of gestational hypertension, eclampsia, and gestational diabetes.[64]

Significance

Findings on the associations between DMN, L&D characteristics and, DMN and gestational hypertension, eclampsia, and gestational diabetes can enable public health officials, policymakers, and health care providers to have a better understanding of access, and utilization of labor delivery care for US-born, Caribbean-born and SSA-born Black mothers who give birth in the US. The present findings can inform future research, policymakers, and providers on ways to provide culturally competent

maternity care services to women, of various ethnocultural backgrounds in the Black diaspora, living, and birthing in the US. After a thoroughly reviewing the current literature, to my knowledge, no other study has examined the associations between DMN, L&D characteristics, and between DMN and gestational hypertension, eclampsia, and gestational diabetes among US-born, Caribbean-born, and SSA-born Black mothers in the US.

Research Questions and Hypotheses

The three studies of this dissertation were guided by the following questions and hypotheses:

Study #1: Systematic Scoping Review.

1.1 What are the factors associated with the access, utilization, and lived experiences of L&D care services by Black women in the US?

1.2 What are the gaps in the extant literature on Black women's utilization of L&D care services in the US?

Study #2: Association between DMN and L&D characteristics.

2.1 What is the relationship between maternal birth country and L&D characteristics? (Delivery characteristics = attendant, place of delivery, method of delivery)

Hypothesis 2.1a: Caribbean-born and SSA-born women will have lower odds of having midwives at birth than US-born women.

Hypothesis 2.1b: Caribbean-born and SSA-born women will have lower odds of having home births, than US-born women.

Hypothesis 2.1c: Caribbean-born and SSA-born women will have lower odds of delivering via cesarean than US-born women.

2.1 Are there differences in L&D characteristics by DMN between Caribbean-born and SSA-born Black mothers when compared to US-born Black mothers?

Hypothesis 2.2a: The odds of having midwives, having home births, and delivering via cesarean will differ across maternal birth countries within the Caribbean and separately within SSA.

Study #3: Association between DMN and pregnancy complications.

3.1 What are the differences in pregnancy complications based on maternal birth country and labor and delivery characteristics between US-born and Foreign-born Black mothers?

Hypothesis 3.1: Foreign-born women will have lower odds of gestational hypertension, and eclampsia but higher odds of gestational diabetes than their US-born counterparts.

3.2 Are there differences in pregnancy complications by DMN between Caribbean-born and SSA-born Black mothers when compared to US-born Black mothers?

Hypothesis 3.2: The odds of pregnancy complications will differ across maternal birth countries within the Caribbean and separately within SSA.

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CHAPTER 2: FACTORS ASSOCIATED WITH ACCESS, UTILIZATION, AND LIVED EXPERIENCES OF LABOR AND DELIVERY CARE AMONG BLACK WOMEN IN THE US: A SCOPING REVIEW

Abstract

This scoping review aims to explore the factors associated with the access, utilization, and experiences of labor and delivery (L&D) care services among Black women in the US. The review utilizes the Andersen Behavioral Model of Health Services Use as a framework to understand the contextual and individual characteristics that influence L&D care utilization.

Peer-reviewed literature published in English in the US between 2011 to 2023 reporting on the type of attendant at birth, place of delivery, method of delivery, or the birthing experience of US-born and immigrant Black women was included. A total of 27 articles were included in the review, which focused on severe maternal morbidity, pregnancy complications, maternal death, birth plan decision-making, and more.

The findings highlight the systemic healthcare barriers faced by Black women, such as limited access to midwifery care, increased prevalence of severe maternal morbidity, and pregnancy complications. Cultural practices, health beliefs, and past healthcare encounters also influence Black women's preferences and behaviors during L&D. The identified gaps in the literature call for more research to understand the factors associated with L&D care among foreign-born Black women who deliver in the US.

Recommendations emphasize the need for cultural competence training, individual and community support, and policy changes, especially pertaining to access to education about midwifery care and alternative birthing methods in out-of-hospital settings to address the disparities and challenges faced by Black women during L&D.

Keywords: access, labor and delivery, Black women, midwifery care, alternative birthing, maternity care decision-making.

Introduction

It is unexpected for the US to have the highest rates of maternal morbidity and mortality when compared to other high-income countries.[1] Yet, every year in the US, approximately 700 women die of pregnancy-related complications to childbirth and more than 50,000 women experience severe maternal morbidity including life-threatening complications as a result of labor and delivery (L&D).[2] L&D refer to the process of childbirth by which a baby is born, from the body's preparations (i.e., contractions) to the moment that the baby and the placenta leave the uterus.[3]

It is known that Black women in the US have a maternal mortality rate almost four times higher than that of their White counterparts even after adjusting for relevant social determinants of health such as age, socioeconomic status, and parity.[2–4] What makes this persisting disparity even more egregious is that a 2022 report using data from 36 states revealed that between 2017 and 2019, 84% of pregnancy-related deaths in the US were preventable.[4] There are numerous personal, cultural, and socioeconomic factors associated with the current US Black maternal health crisis, including a shortage of maternity care providers, unequal access to maternity care services, and inequities rooted in structural [5] and obstetric racism.[6] Additionally, Black people in the US are a very diverse population consisting of US-born and immigrants mainly from the Caribbean and Sub-Saharan Africa (SSA).[7–9] The current five million US Black immigrant population is projected to grow 90% by 2060.[10] Foreign-born women giving birth in the US have different cultural practices and health beliefs which can influence their expectations and interactions with the health care system, and ultimately their health outcomes. Thus, considering the distinct challenges faced by foreign-born Black women in reproductive health, research is important.

Previous research has sought to provide insight into Black women's maternal and neonatal birth outcomes such as morbidity and mortality.[11–15] Some of these studies do differentiate between US-born and foreign-born Black women, however, these distinctions are usually dichotomous (i.e., born in the US vs. elsewhere) not allowing for comparisons by specific country of birth.[11–15] One study published in 2010 assessed preferences in L&D practices (including method of delivery, choice of pain relief, place of delivery, and position in labor) between pregnant Somali, Sudanese immigrants and US-born women,

however, the authors did not differentiate between White and Black US-born women.[16] The literature on the factors that influence Black women's access, utilization, and L&D experiences while considering maternal country of birth is scarce.

Significance

To eradicate the US Black maternal mortality crisis, factors associated with Black women's maternity care experiences in the US require comprehensive understanding. By delving into both contextual and individual characteristics associated with Black women's access and utilization of L&D care services, and their lived childbirth experiences in the US, this scoping review stands as a necessary investigation to highlight the unique challenges faced by diverse Black women during L&D. Our findings aimed to bridge the gaps in the extant literature and provide guidance for future research, and clinical practice.

Aims & Conceptual Framework

Using the Andersen Behavioral Model of Health Services Use [17,18] to guide our understanding, this scoping review aimed to present a comprehensive overview of the factors associated with the L&D care access, utilization and the lived childbirth experiences within the diverse Black US Diaspora. The Andersen Model underlines the contextual and individual characteristics that influence the use of healthcare services, and resulting outcomes (Table 2). [17,18] Both contextual and individual characteristics include predisposing factors (i.e., that incline individuals to access care), enabling factors (i.e., that facilitate or restrict care usage), need factors (i.e., one's demand for care), and individual health behaviors such as dietary habits, and engagement with formal healthcare services (e.g., prenatal & L&D care). [17,18] The factors of interest in this review included barriers and facilitators to quality L&D care, preferences for the type of attendant at birth, place of birth, and method of delivery.

Methods

Scoping reviews are ideal to explore and understand the breadth and depth of under-researched topics.[19,20] This study was conducted in accordance with the Joanna Briggs Institute (JBI) guidelines[20] for conducting scoping reviews and is reported using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR) [21] checklist provided in

(Appendix B).

Eligibility Criteria & Search Strategy

This review includes peer-reviewed research articles using quantitative, qualitative, mixed-methods designs, and grey literature. Studies with participants identifying as Black women born in the US or in another country who have given birth in the US, and report at least one of the following L&D characteristics were included: the type of attendant at birth (i.e., physician or midwife), the place of delivery (i.e., facility or home), and the method of delivery (i.e., vaginal or cesarean), or the birthing experience. Literature that did not center on the L&D experiences of Black mothers (i.e., where Black mothers were the population of interest or the had at least 25% of participants identify as Black mothers) or did not report on at least one of the aforementioned L&D characteristics, has been excluded from this review.

With the help of the UNC Charlotte Health and Human Services Librarian, the lead author (FNY) developed a search strategy including keywords such as Black, African American, Caribbean, African, obstetric labor, obstetric delivery, childbirth, birthing attendant, vaginal delivery, cesarean delivery, and VBAC. MeSH terms were developed from the keywords for searches in three databases: PubMed, CINAHL, and Web of Science. Searches were carried out for literature from January 2003 to March 2023, however, due to the lack of studies meeting inclusion criteria, the time frame was adjusted to the last 12 years of literature from 2011-2023. The reason for the start date of 2011 was to capture literature published slightly before as well as after the enactment of the Affordable Care Act in 2014 which led to an increase in access to health insurance for many previously uninsured Americans. [22–24] Literature was screened using the criteria described below.

Population

Eligible literature focused on people who identified as US-born or foreign-born Black women of reproductive age (i.e., 15-49) [25] who have accessed or planned to access obstetric L&D services in the US. Due to the dearth of research centering on the L&D experiences of Black women in the US, emphasis was placed on including literature that oversampled Black participants.

Concepts

Literature that identified factors associated with Black women's access and utilization of L&D care services, and/or their birthing experiences was included. Such factors included facilitators and barriers encountered by Black women when seeking access to L&D services including preferences in provider, place of delivery, method of delivery, and lived childbirth experiences. Literature pertaining to developing theories, conceptual frameworks, or study protocols that did not also describe facilitators, barriers, and the lived childbirth experiences of Black women in the US were excluded.

Context

Only literature written in English and studies conducted in the US were included.

Inclusion Criteria

There were no restrictions on the type of literature considered. The primary focus was on participants who identified as Black women and had given birth in the US. It was essential that the study samples included at least 25% Black participants. Moreover, the selected literature needed to report on at least one L&D characteristic, such as the attendant at birth, place of birth, method of delivery, or the lived childbirth experience. All included studies were published between 2011 and 2023.

Exclusion Criteria

Studies that focused on non-Black populations were not considered. Any literature with study samples that had less than 25% of participants identifying as Black was excluded. Additionally, if the literature did not report on any L&D characteristics, it was not included. Studies that concentrated on pediatric populations were also excluded. Lastly, any literature not published between 2011 and 2023 was not considered.

Study Selection

The searches resulted in a total of 338 articles. The lead author (FNY) used Zotero, a reference managing software [26] to organize, store, and manage all references. FNY then independently screened all titles/ abstracts in Covidence software [27] using the criteria described in the previous sections and developed an extraction tool tailored to the present scoping review. After three rounds of screening, 27

studies were included for final full-text review. Two reviewers (FNY) and (KLR) then independently pilot tested the extraction tool using a subset of the same five articles in Covidence [27] and met to discuss discrepancies and make necessary edits to the extraction tool. No conflicts were reported.

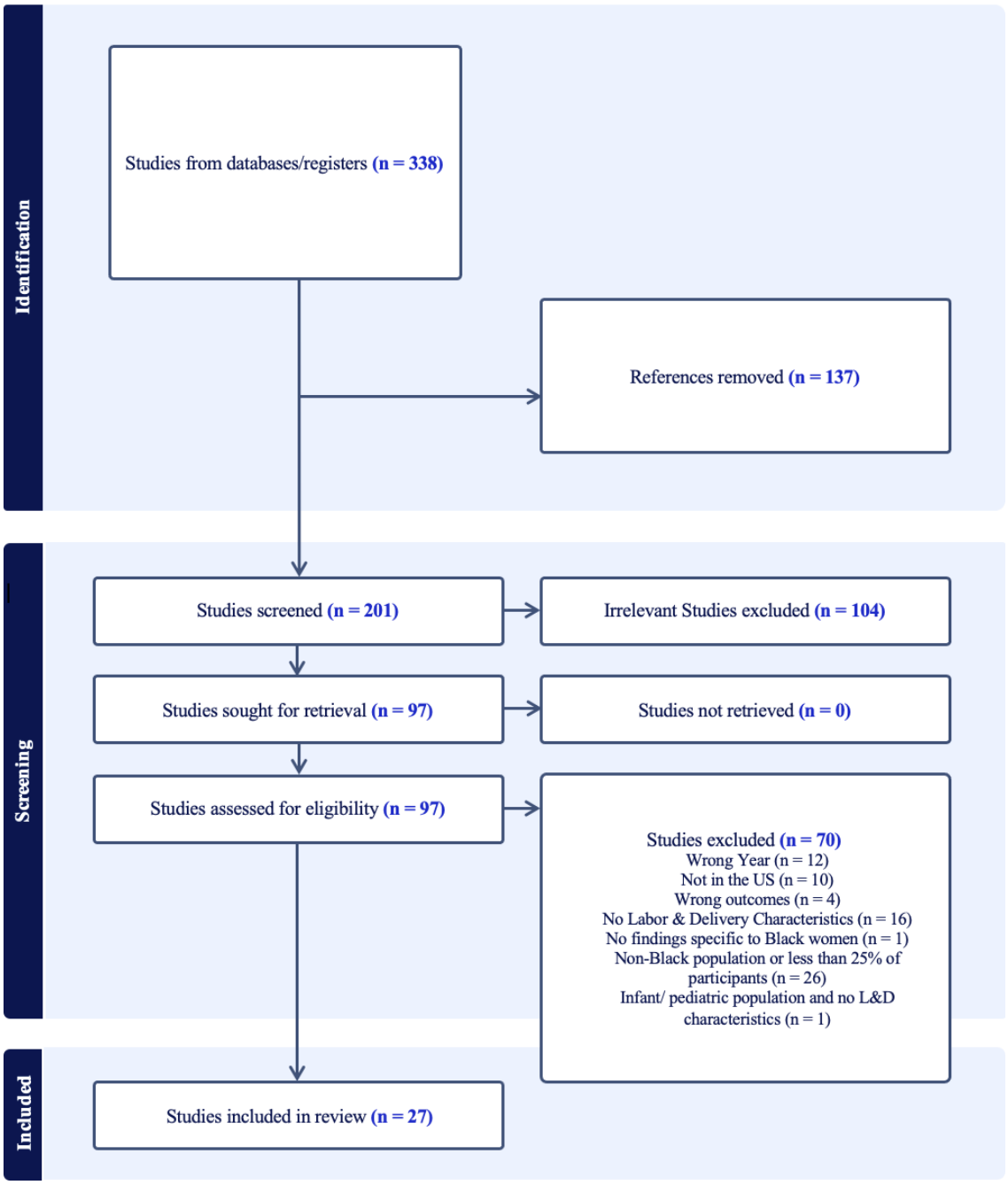

Figure 1. PRISMA Flow Diagram of Data Search & Results.

Data Extraction, Analysis, and Synthesis

The data were charted within Covidence according to Arksey and O'Malley's (2005) scoping review framework [28] including the following data points: title, authors, year, aim, study design, region, population demographics, data analysis, main findings/themes, strengths and limitations. An abbreviated version of the data chart is provided in Table 1 (Appendix A). The extracted data were exported into Excel for validation and coding using thematic analysis to identify major themes in each paper. Table 2 summarizes the key themes identified through the lens of the Andersen Model of Health Services Use.

Results

A total of 338 studies were identified in the initial search. After removing duplicates (n=137), the abstracts of 201 studies were screened to determine eligibility for inclusion leading to the exclusion of 104 articles that did not meet inclusion criteria. Ninety-seven articles remained for full text assessment for eligibility. Another 70 articles were excluded for reasons including not being US based (n=10), not having a Black participant population of at least 25% (n=26) or not including any information on L&D characteristics (n=16) (See Figure 1). Thus, 27 articles were included in this scoping review. No additional studies were identified from references of these articles (Fig. 1).

Of the 27 articles, 4 were qualitative, 15 were quantitative, and one was a mixed-methods study. The remaining seven were a text and opinion paper, a viewpoint paper, a case report, a field innovation paper, a diagnostic test accuracy study, a scale development/validation paper and a systematic review. The studies included in this review focused on severe maternal morbidity, pregnancy complications, maternal death, birth plan decision-making, method of delivery, location of delivery, type of attendant or pregnancy support persons, trust, and experienced discrimination. In the following paragraphs, the results of this scoping review are discussed in terms of contextual, and individual predisposing, enabling and need characteristics based on the Adapted Andersen Model of Health Care Utilization (Table 2).[17,18]

Contextual Characteristics

Predisposing Factors

Access to certain health services was a contextual predisposing factor in some studies. For example,

one study reported that births occurring in states with higher proportions of Black births had lower access to midwives and that this was associated with lower scores on the Midwifery Integration Scoring System (MISS).[29] In the viewpoint paper by Ogunwole et al., 2020, the COVID-19 pandemic was identified as a contextual factor by way of structural racism placing residents of predominantly Black counties at higher risk of infection as well as of chronic diseases. Lastly, the preference for certain healthcare providers, and places of delivery were also predisposing factors in one study where 34.8% of Black women preferred midwives compared to 23.7% of White women [30] and in another study in which Black women indicated a preference for out of hospital births due to concerns about a lack of control over epidurals, cesarean sections, and pain management during long hospital deliveries.[31]

Enabling Factors

The majority of enabling factors identified were associated with access to healthcare services. Two studies about severe maternal morbidity highlighted the role of income for accessing treatment for severe maternal morbidity, including conditions like sepsis and avoiding maternal mortality [32] and health insurance coverage.[32, 33] Having lower income was associated with developing sepsis during pregnancy, L&D, as well as postpartum [32] and Black Medicaid users had higher rates of readmission after delivery compared to non-Hispanic White Medicaid users (OR=1.22; 95% CI= 1.06-1.42). [33] Other enabling factors included hospital resources, policies, practices, and obstetric care in various geographical locations.[34–38] Community support was also identified as an enabling factor, particularly among immigrant Somali women in Minnesota who reported receiving support after delivery from other Somalis in their communities, some with no prior relationship with the new mother.[39] Availability of VBAC as an option for women with previous cesarean deliveries,[40] along with VBAC education and planning, especially in Black populations[41], were notable contextual enabling factors.

Need Factors

Although a rare condition, maternal sepsis, sepsis-related maternal death, and the risk of hospital readmission after delivery were identified in two studies where after adjusting for confounders. Black women were 20% more likely to develop sepsis and also 72% more likely to experience sepsis-related

deaths than White women (p=.026).[32] In one study that examined delivery-related indicators such as complicated vaginal or cesarean delivery in hospitals serving different racial and ethnic groups, the most prevalent delivery-related indicators were complicated vaginal delivery, complicated cesarean delivery, and obstetric trauma.[34] Black-serving hospitals had overall lower performance on delivery-related indicators and higher rates of complications for either method of delivery among Black women when compared to White women in adjusted models. Black women also had a higher risk of complicated deliveries regardless of method and higher rates of indicators than White women. [34] In a mixed-methods study about L&D unit (LDU) closures in rural Georgia from 2012 to 2016, the LDUs that closed had higher proportions of Black female residents in their primary care service areas (PCSAs), Black maternity patients, and patients with Medicaid, self-pay, or other government insurance. These LDUs also had lower birth volume, more women giving birth within their PCSA of residence, fewer obstetricians and obstetric provider equivalents per LDU, and fewer average annual births per obstetric provider. Qualitative results indicated that financial distress was the primary contributor to closures, but low birth volume and obstetric provider shortage also played a role.[35]

Individual Characteristics

Predisposing Factors

At the individual level, demographic characteristics including age (≥35 years specifically) nationality, and having lower income, were identified as predisposing factors.[32] Several studies noted that the health beliefs of individuals, including their expectations and prior experiences with healthcare providers, influenced their access and use of L&D services. For example, Black mothers had plans for alternative delivery methods, including out-of-hospital births attended by midwives and supported by doulas or other perinatal support persons, indicating a belief in the effectiveness of and desire for less medicalized birthing services.[30,31,42–46] Additionally, cultural beliefs and personal preferences were also identified as predisposing factors. For example, in two studies by the same author, the cultural and religious beliefs of Somali immigrant mothers influenced their childbirth experiences.[30,39,46] There was a lack of understanding for the medical need for cesarean deliveries, as well as beliefs that cesareans are

automatically done for the financial benefit of physicians, or a punishment from God for past sins leading to some Somali women avoiding hospitals at onset of labor [30,39,46].

Enabling Factors

Several studies emphasized the importance of the presence of a perinatal support professional, such as a doula in enhancing experiences with medical providers during childbirth through emotional support and advocacy.[31,42] The presence of doulas at delivery was associated with better decision-making strategies, such as opting for alternative birthing practices, thus allowing women more control over their birthing process.[43,47] Some factors served as both individual and contextual enablers. For example, in one study about 'By My Side,' a community doula program in New York, participants experienced significantly lower rates of preterm birth (5.6% vs. 11.9%, $p<0.0001$) and low birthweight (5.8% vs. 9.7%, $p=.0031$) and were more likely to give birth in a birthing center (3.2% vs 0.3%, $p<0.0001$) or at home (2.3% vs 0.8%, $p<0.0001$) compared to the non-participating group.[48]

Need Factors

At the individual level, several studies captured the lived experiences of women during childbirth and reported the following needs: physical, emotional, and educational support from nurses during L&D; [39] information on available resources for postpartum depression;[39] access to the preferred birthing attendants for Black women including midwives and doulas; increased access to education and information about midwives, doulas, midwifery-led birthing plans and alternative birthing methods;[46] for policy to address inequities in knowledge of, access to and utilization of midwifery care among Black women in the US.[29]

Cultural competence, and respect in healthcare settings were underscored as essential need factors.[31,42,49] Other individual need factors included culturally appropriate care, frank communication with healthcare providers, as well as the need for counseling Somali women about the potential delay in a second live birth after cesarean.[39,46,49] Availability and accessibility of information and educational resources about midwifery-led alternative birthing were also individual need factors identified in two studies.[43,47]

Table 1: Applied Andersen Model for Study Findings

	Contextual Characteristics	Individual Characteristics	Health Behaviors & Practices	Outcomes: Delivery Characteristics
Predisposing	Geographical disparities in access to L&D care: States/ counties with high proportion of Black births (low access to midwifery care, LDU closures) Structural Racism: COVID-19 infection more likely in Black counties Higher rates of experienced discrimination compared to other women of color Preference for midwives and out-of-hospital births	Nativity Status Age Income Insurance Status Personal health beliefs Expectations from healthcare providers Cultural and religious beliefs Preference for Alternative Delivery Methods	Community Support after Delivery Avoidance of Hospitals due to Cultural & Religious Beliefs Seeking Perinatal Support Alternative Birthing Practices Seeking Cultural Competence and Respect Seeking Culturally Appropriate Care and Communication	Type of attendant Place of delivery Method of delivery Birthing experience
Enabling	Economic conditions: patient income, and provider reimbursement Health insurance: Higher adverse outcomes among Black Medicaid users Community support: especially among immigrant communities, Community-Doula Programs	Perinatal support professionals, especially doulas Provider Support		

Table 1: Applied Andersen Model for Study Findings (Continued).

Need	Prevalence and risk of maternal sepsis and sepsis-related maternal death	Pregnancy complications
		Comorbidities
		Maternal Health Literacy/ Education
	Higher rates of complicated vaginal or cesarean deliveries in hospitals serving predominantly Black patients	Physical, emotional, and educational support about and during L&D
		Access to preferred birthing attendants, midwives, and doulas
	Impact of L&D unit closures in rural areas on Black women	Policy changes to address inequities in midwifery care
		Cultural competence
		Respect
		Appropriate communication
		VBAC education and Planning

Discussion

The focus of this scoping review was to provide a comprehensive overview of the research regarding factors affecting Black women's access, utilization, and experiences of L&D care services in the US. The Andersen Behavioral Model of Health Services Use [17,18] provided a systematic approach to understanding the complex interplay of contextual and individual characteristics that influence L&D care service utilization among this population.

The structural environment in which Black women receive care plays a central role in their L&D experiences, with fewer midwife access in states with more Black births suggesting systemic healthcare barriers. These obstacles, intensified by the COVID-19 pandemic and structural racism in predominantly Black areas, extend beyond the medical sphere. Economic factors, such as income and insurance, correlate with conditions like sepsis and varying hospital readmission rates, accentuating the disparities in quality care access. Furthermore, the value of community support, especially for immigrants, is crucial, while the higher rates of sepsis-related deaths and LDU closures in areas densely populated by Black women highlight the deep-rooted inequities in the healthcare system.

Demographic factors, including age, nationality, and income, along with cultural beliefs and past healthcare encounters, influence Black women's choices in L&D services. For instance, some Somali immigrant women avoid hospitals due to cultural or religious reasons. The presence of support, notably from doulas, is vital, with Community-Doula Programs indicating enhanced L&D experiences for Black women. Personal support during childbirth, from nurses or information about postpartum depression, combined with a culturally sensitive approach, is paramount for a holistic L&D care experience.

Limitations & Strengths

This systematic scoping review was conducted with certain limitations. Primarily, the study was constrained by the selection of literature exclusively written in English and conducted only in the US, which could potentially overlook relevant insights from studies in other languages or contexts. Furthermore, the eligibility criteria, though extensive, were very specific and might have inadvertently excluded pertinent studies that fell slightly outside of these specifications. Although this review aimed to

cover all Black women's L&D experiences in the US, including foreign-born Black women, the literature covering the L&D access, utilization, and experiences of foreign-born Black women in the US is scarce. Out of 27 papers only 3 highlighted foreign-born women's L&D experiences and 2 of them focused solely on Somali-born women.[39,49,50] Lastly, while scoping reviews are optimal to cover the breadth of scarcely researched topics, the design does not involve a quality assessment therefore we were unable to assess the quality of included articles.

Nevertheless, this review exhibited several strengths that enhance its value to the scientific community. The study used the reputable Andersen Behavioral Model of Health Services Use, [17,18] which provides a comprehensive framework for understanding both individual and contextual characteristics that impact healthcare utilization. By adhering to established protocols such as the Joanna Briggs Institute guidelines[20] and the PRISMA-ScR checklist, [21] the review ensured methodological rigor and transparency in its approach. The inclusion of diverse study types, including qualitative, quantitative, mixed-methods, and grey literature, offers a holistic view of the topic. Moreover, the focused criteria ensured that the literature centered on the experiences of Black mothers, highlighting their unique challenges and preferences. Finally, the collaborative approach, involving dual reviewers and the consultation with a specialized librarian for search strategy development, likely bolstered the accuracy and comprehensiveness of the review.

Research Gaps & Conclusions

A significant outcome of this review was the identification of gaps in the existing literature. While several studies highlight disparities and challenges faced by US-born Black women in the US during childbirth, more research is needed to understand the factors associated with L&D care access, utilization and experiences among foreign-born Black women delivering in the US. The roles of policy, healthcare infrastructure, and cultural competence training for healthcare professionals deserve more attention. In conclusion, the complex interplay of individual and contextual factors significantly affects Black women's L&D care experiences in the US. While some studies have explored these factors in depth, there's a need for more research disaggregated by specific characteristics such as detailed maternal nativity. Addressing

the highlighted disparities and challenges require concerted efforts at multiple levels - from policymaking, healthcare training, healthcare infrastructure to individual patient support and community engagement.

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Appendix A: PubMed Search Strategy

Descriptors	Population	AND	Concept 1: Labor	AND	Context: United	Final Search
	US-born		and Delivery		States	
Keywords	Black OR African-american		home birth OR “birth attendant" OR "birth attendants" OR "place of birth" OR "hospital birth" OR "hospital births" OR doula		united states OR u.s. or usa or america*	Search (((Black OR African-american AND foreign-born OR native-born OR immigrant OR caribbean OR African OR sub-saharan african)) AND (home birth OR “birth attendant" OR "birth attendants" OR "place of birth" OR "hospital birth" OR "hospital births" OR doula AND obstetric delivery)) AND (united states OR u.s. or usa or america*)
	AND Population foreign-born foreign-born OR native-born OR immigrant OR caribbean OR African OR sub-saharan african		AND Concept 1 broad term: obstetric delivery			

Appendix B: Table 1 Characteristics of included studies.

AUTHOR/ YEAR LOCATION	DESIGN & SAMPLE	OUTCOMES DEFINITIONS	MEASUREMENT OF OUTCOMES	RELEVANT FINDINGS	THEMES
AL-OSTAD ET AL., 2015 ***MULTIPLE STATES***	**Retrospective Cohort Study** All Births from Healthcare Cost and Utilization Project-Nationwide Inpatient Sample (HCUP-NIS) database 1998-2008. **Total N** = 5,338,995 **Black N (%)** = (9.69%) out of 5,337,424 without sepsis, (17.82%) out of 1571 with sepsis. **Comparison Group:** all deliveries without a sepsis diagnosis.	1.Incidence rate and mortality rate of maternal sepsis 2.Associated risk factors for developing maternal sepsis during pregnancy, labor and delivery (L&D) and postpartum.	Multivariate logistic regression	Being over 35, Black, having lower income, and smoking were associated with developing sepsis. After adjusting Black women were 20% more likely to develop sepsis than White women (OR=1.20 95% CI 1.02-1.41) p=.026. Black women were also 72% more likely to experience sepsis-related deaths than White women.	Severe Maternal Morbidity Maternal Mortality

Table 1 characteristics of included studies. (continued)

BLACK, C.M., ET AL., 2021 ***MULTIPLE STATES***	**Retrospective Cohort Study** All delivery hospitalizations with a live birth in 2016 from MarketScan Commercial Claims and Encounters & Medicaid databases. **Total N** =165,444 live births **Total Black N** (%) = 20,284 30.5% of Medicaid users (only available for Medicaid users)	1.Risk of hospital readmission after delivery and severe maternal morbidity (SMM). **SMM Definition:** Occurrence of one or more of 21 indicators/ potentially life-threatening maternal conditions/ complications.	Multivariable Logistic Regression	Black Medicaid users had higher rates of readmission after delivery compared to non-Hispanic White Medicaid users (OR=1.22; 95%CI= 1.06-1.42).	Severe Maternal Morbidity Medicaid
BLACK, C.M., ET AL., 2022	**Retrospective Cohort Study** All women with a live inpatient birth in 2016 from MarketScan Commercial Claims and Encounters. **Total N** = 170,760 (commercial), 219,670 (Medicaid) **Total Black N** (%) = 72,856 (34.1%) among Medicaid group,	1.SMM which was defined as the occurrence of one or more of 21 indicators/ potentially life-threatening maternal conditions/ complications.	Multivariate logistic regression	Black mothers, and women with multifetal gestation, and those who delivered by cesarean section had significantly more prevalence of SMM.Black mothers had the highest incidence of SMM compared to other races among patients with Medicaid insurance.	Severe Maternal Morbidity Medicaid

	commercial unknown				

Table 1 characteristics of included studies (continued).

COLLINS ET AL., 2021 ***OHIO***	**Qualitative, Phenomenological** (interviews) **Total N** = 25 Black women that were enrolled in a program providing a perinatal support person (PSP) (similar to doulas).	Nature and characteristics of Black women's interactions with medical providers during childbirth when they were accompanied by a perinatal support professional and what shaped those experiences.	Thematic analysis (not named, but described)	Positive experiences: having a responsive and helpful care team having birth plans respected Negative experiences: feeling disrespected, ignored or invisible, feeling pressured or rushed, disrespect of the PSP.	Responsive care team Respect of birth plans Disrespect of patient Disrespect of PSP Feeling ignored or invisible Feeling pressured Feeling Rushed
CREANGA ET AL., 2014 ***MULTIPLE STATES***	**Cross-sectional Study** Used Healthcare Cost and Utilization Project's State Inpatient Database (SID) data from 7 states, 2008-2011 to examine 15 delivery-related indicators. SID data were linked with American Hospital Association	1.Rates of the selected delivery-related indicators.	Delivery-related indicator rates. Poisson Regression Models	The most prevalent delivery-related indicators were complicated vaginal delivery, complicated cesarean delivery, obstetric trauma. Overall lower performance of Black-serving hospitals on delivery-related indicators and higher rates of	Higher risk of complicated deliveries regardless of method. Higher rates of indicators among Black women. Low rates of obstetric trauma in Black and Hispanic serving hospitals.

	(AHA) data from 6/7 of the states to obtain hospital characteristics. **Total N** = 4,456,426 delivery hospitalizations 1021 White-serving, 56 Black-serving, and 530 Hispanic-serving hospitals. **Total Black n** (%) = White-serving hospitals= 9.87% Black mothers; Black-serving hospitals= 66.41% Black mothers; Hispanic-serving hospitals = 6.21% Black mothers.			complications for either method of delivery among Black women when compared to White women in adjusted models.	

Table 1 characteristics of included studies. (continued)

DAVIS, 2019 ***MULTIPLE STATES***	**Ethnography/ Case studies with a Black feminist approach** **Total N** = 17 **Total Black n** (%) = Three Black mothers (cases).	To demonstrate the presence and effects of obstetric racism through various stories of Black births. More specifically, (1) to frame obstetric racism in the literature on adverse birth outcomes; (2)	Interviews with Cases. Interviews with birth workers. Analysis not described (Though a type of narrative analysis of interview data	Participants birth plans, including the place of delivery, the method of delivery, and the attendant at birth were all undermined in the participants'	Birth workers (doulas and midwives) help women maintain bodily autonomy and planning a birth on one's own terms. Neglect

	to describe the methodological approach of the study; (3) to present 3 case studies of Black women's medical encounters to elucidate the concept of obstetric racism; and (4) to explore the role of birth workers who seek to intervene and decrease women's obstetric racist encounters.	seems to be present).	stories; Black women were subjected to unwanted C-sections, drugs (Pitocin and epidurals), and NICU stays (even when they could not be justified clearly). Participants had plans to have doulas/midwives at their labor and delivery to aid in advocating for their birth plan and navigating birth choices, but 2/3 participants' birth plans were changed due to circumstances out of their control. "[…] when Black women express wanting to have control over their births, 'some nurses and doctors, regardless of the medical professionals' race, punish Black moms. It is like they don't deserve to have the	Lack of information Dismissiveness Disrespect Interventions without explanation

				kind of birth they want.”	

Table 1 characteristics of included studies. (continued)

DAYMUDE ET AL., 2022 *RURAL GEORGIA*	**Mixed-Methods Study** **Quantitative:** The study used data from the Georgia Department of Public Health Online Analytical Statistical Information System (OASIS), regional household income data from the US Census Bureau, Provider and L&D Unit (LDU) information from the Georgia Maternal and Infant Health Research Group, and patient data from Emory's MCH linked vital records data repository. **Qualitative:** The study used newspaper articles and Georgia's	To explore what factors may be associated with rural hospital LDU closures in Georgia from 2012 to 2016.	**Quantitative:** Odds Ratios;95% confidence intervals; Cochran-Mantel-Haentzel; **Qualitative:** Content & Thematic analysis.	**Quantitative:** Odds of having a Black female resident (15-44) and Black women were 7% and 46% higher respectively for PCSAs containing LDUs that subsequently closed compared to PCSAs with LDUs that remained open. After controlling for payor group, LDUs that eventually closed had 34% higher odds of having Black patients than LDUs that remained open. **Qualitative:** LDU closures attributed to: Costly obstetric services receiving	Black women may have been more reliant on the LDUs that closed or were less able to access care in the LDUs that remained open, thus experiencing disproportionate impact of the closing LDUs. LDUs that remained open had a greater influx of patients from neighboring regions compared to LDUs that closed.

	OBGYN society reports from 2011 to 2016. 30 rural LDUs in Georgia **Total Black** (%) = 30.16-34.45% of Black women per Primary Care Service Area (PCSA); 31.85-41.92% of Black birthing patients per LDU	inadequate reimbursement. Refusal to expand Medicaid and budget cuts to rural hospitals under the ACA.	Birth Volume: Lower for PCSAs with LDUs that closed (313) compared to PCSAs with LDUs that remained open in 2011(365, p = .49). Location of Delivery: The nearest birth hospitals to LDUs that closed had higher median annual birth volumes (773.5) than the nearest birth hospitals to LDUs that remained open (327) (p = .06).	

Table 1 characteristics of included studies. (continued)

DEICHEN HANSEN ET AL., 2021 ***FLORIDA***	**Cross-sectional Qualitative Pilot Study** **Total N** = 11 Black women **Total Black N** (%) = 11 (100)	1.Prenatal practices 2.Birthing Experiences	Thematic Analysis	**Theme 1: Decision-Making Strategies for Employing Alternative Prenatal Care and Birthing Practices** - 7 women decided to use alternative birthing practices (i.e., de-emphasizing more common obstetric trends and requiring less invasive procedures or interventions) 5/11 women reported using midwifery at some point in their pregnancies, 4/11 indicated a preference for OOH midwife or doula-supported births, and 2/11 had OOH births. Women's preferences for OOH births were due to concerns about a lack	Decision-Making Strategies for Employing Alternative Prenatal Care and Birthing Practices Accessing Formal Resources for Pregnancy and Childbirth Seeking Advice from Other Black Women with Similar Perspectives on Birthing and Parenting Being Confident in One's Decisions

			of control over epidurals, cesarean sections, and pain management during long hospital deliveries. **Theme 2: Accessing Formal Resources for Pregnancy and Childbirth** - Participants expressed the need for resources and educational opportunities (i.e., birthing & breastfeeding classes) offered after business hours and inclusive of Black women and working mothers due to a lack of accessibility and inclusivity, and race-concordance with instructors in existing resources. **Theme 3: Seeking Advice from Other Black**

Women with Similar Perspectives on Birthing and Parenting -

at least half of the participants stated that their decisions were influenced by their mothers, grandmothers, other influential women in their partner's families as well as other trusted Black women in their community with whom they had built bonds over time. Participants also found parenting groups on social media useful to learn and explore alternative care options.

Theme 4: Being Confident in One's Decisions -

both formal and informal sources of information helped the

				women feel more confident and empowered in their birthing decisions.	

Table 1 characteristics of included studies. (continued)

DRASSINOWER ET AL., 2014	**Cross-sectional Study** **Total N** =1009 vertex-vertex twin pregnancies **Total Black n (%)** = 274, (27.2%)	1.Unplanned cesarean section in the trial of labor group. 2.Maternal Outcomes: Postpartum hemorrhage Blood transfusion Intensive care unit (ICU) admission Repeat laparotomy Maternal death 3.Neonatal outcomes (not reported here)	Multivariate logistic regression	Black women were (n=22, (8%) the least likely to have an elective cesarean compared to White women (OR=0.5; 95% CI, 0.3-0.8) Similar rates of preterm delivery between 32 and 36 weeks across ethnicities, with an overall rate of 58.5% (White 60.3%, Black 56.7%, Hispanic 58.3%, Asian 51.7%, and other 50%, p=0.26)	Severe Maternal Morbidity and Mortality Method of delivery

Table 1 characteristics of included studies. (continued)

GROBMAN, ET AL., 2015	**Cohort Study** 25 medical centers of the Eunice Kennedy Shriver National Institute of Child Health and Human Development Maternal-Fetal Medicine Units (MFMU) Network assembled an observational obstetric cohort (i.e., the Assessment of Perinatal EXcellence (APEX) study) **Total N** = 109,208 **Total Black n (%)** = 27,291 (25%)	1.Frequency of adverse outcomes during or after L&D. 2.Association between types of obstetric care provided (e.g., episiotomy) and race and ethnicity.	Multivariable Logistic Regression	Non-Hispanic Black, Hispanic, and Asian women all had significantly greater odds of experiencing a severe postpartum hemorrhage or peripartum infection than non-Hispanic White women Non-Hispanic White women, Asian women had significantly higher odds of laceration, while non-Hispanic Black women had significantly lower odds of laceration although no longer significant after adjusting for differences in patient characteristics. Black women were significantly less likely to have, labor	Severe Maternal Morbidity Postpartum Complications Method of delivery

				inductions, vaginal deliveries, and episiotomies.	

Table 1 characteristics of included studies. (continued)

HAYWORTH ET AL., 2020 ***STATE UNKNOWN***	**Case Report** Electronic Medical Record **Total N** = 1 Back Patient	Report on treatment of peripartum cardiomyopathy (PPCM) during L&D. PPCM Definition:	Tests which confirmed the PPCM diagnosis and led to a cardiology consult: blood pressure monitoring Heart rate monitoring preeclampsia blood panel Computed tomography (CT) scan Chest X-ray (CRX)	Labor induction and vacuum assisted delivery of healthy baby but patient then experienced a series of complications leading to the implantation of a permanent left ventricular assist device (LVAD). Before LVAD implant: Patient wanted to breastfeed so the cardiology team collaborated with obstetrics, pediatrics, and a lactation consultant to determine which medications were safe and develop a nursing plan to support breastfeeding,	A need for additional training, and interdisciplinary collaboration of highly specialized providers.

				mother-baby bonding, fundal rubs (massages performed after delivery to help the uterus contract and prevent postpartum hemorrhaging , and infection). Patient discharged home with devices to monitor and prevent sudden death. Home health care visits and frequent follow-up in the Heart Failure clinic were arranged.	

Table 1 characteristics of included studies. (continued)

KATHAWA ET AL., 2022 ***MULTIPLE STATES***	**Qualitative Study** **Total N** = 8 doulas of color **Total Black n (%)** = 4 (50%)	Conceptualization of the influence of racial and ethnic identities on birth work within the context of racial disparities in birth outcomes among doulas of color.	Content Analysis of interview data.	Four major themes: **Relationship with the medical system-** sub themes: agency in L&D , preference for race concordant providers due to distrust of White	Relationship with the medical system Role of identity in the doula's work Role of class Divisions within the birth movement

providers, generational trauma.

Role of identity in the doula's work - Sub themes: less dismissal of validity of challenges due to similar lived experiences, awareness of the necessity for culturally appropriate care to eradicate disparities, birth work passed down to generations, higher likelihood of having successful unmedicated vaginal delivery.

Class and the accessibility of the natural birth movement – Sub themes: financial barriers to accessing doula support, financial barriers access doula training and certification, feeling called to serve

				people who cannot afford care, feeling like the help with White clients **Divisions within the natural birth movement –** Sub themes: divisions between professional and community doulas, cultural appropriation and White people capitalizing on the natural birthing movement resulting in leaving out the people who invented the movement while privileged people with a lesser need benefit.	

Table 1 characteristics of included studies. (continued)

KOZHIMANNIL ET AL., 2014 ***MULTIPLE STATES***	**Retrospective Cohort Study** Used linked hospital discharge and birth certificate data for the uncomplicated term (>37 0/7	1.Association between early term nonindicated birth (initiated by induction or cesarean). 2.Prolonged length of stay	Survival Analysis using Multivariable Cox Proportional Hazards Models.	Black women had substantially higher rates of nonindicated cesarean birth without labor (HR, 1.29 [95% CI, 1.27- 1.32])	Nonindicated cesarean without labor Method of delivery

	weeks' gestation) births between 1995-2009 in California, Missouri, and Pennsylvania. **Total N** = 7,296,363 full-term, uncomplicated pregnancies; 232,189 Early-term nonindicated deliveries **Total Black n (%)** = 17,020 (7.33%) full-term, uncomplicated pregnancies; Early-term nonindicated cesarean 5977 (5.51%)	and infant respiratory distress.		compared with non-Hispanic White women, after controlling for other risk factors. Minority racial/ethnic status was associated with higher rates of early-term nonindicated cesarean without labor, whereas nonHispanic White women had comparatively higher rates of early-term nonindicated induction. Racial/ethnic minority women had substantially lower rates of early term nonindicated labor induction than did non-Hispanic White women.

Table 1 characteristics of included studies. (continued)

LIESE ET AL., 2022 ***CHICAGO, ILLINOIS***	**Other:** An innovation from the field of midwifery, Melanated Group Midwifery Care (MGMC). *******MGMC is part of a randomized control trial in which it is compared to traditional perinatal care in Chicago.*	Description of MCMG.	N/A	**MGMG has 4 evidence-based strategies:** (1) racial concordance between Black midwives and patients. (2) group prenatal care. (3) nurse navigation. (4) one year of in-home postpartum doula support.	Midwifery-led perinatal care model Promotion of engagement in one's own care Positive provider-client interactions

Table 1 characteristics of included studies. (continued)

MISSAL ET AL., 2016 ***MINNESOTA***	**Qualitative Study: Ethnonursing** Total N = 12 Somali immigrant mothers who had delivered a healthy child in the 3 years prior to data collection.	Immigrant Somali mothers' childbirth experiences in Minnesota.	Leininger's four-phase ethnonursing data analysis of interview data.	11/12 participants had normal spontaneous deliveries 1/12 had a cesarean delivery **Six major themes** **Theme 1: Limitations of Support due to Separation From Family** - Support from Somali community (known and unknown)	Social Support Physical, Emotional, and Educational Support form nurses Cesareans done for financial benefit of physician Lack of understanding of the need for cesareans Depression believed to be a sign of weakness

	Theme 2: Importance of Cultural and Religious Practices – Muslim call to prayer first thing baby hears.	Lack of assistance form nurses Need for information about available resources for postpartum depression
	Theme 3: Desired Relationships with Nurses - Desire for communication with nurses	
	Theme 4: Fear of Cesarean Section – Belief that cesarean = God's punishment Avoiding hospitals at onset of labor due to belief going in would lead to automatic cesarean	
	Theme 5: Value of Education – Desire to educate themselves to better their lives and serve their communities.	

				Theme 6: Views on Postpartum Blues/Depression – Postpartum experience in Somalia less stressful then in US.	

Table 1 characteristics of included studies. (continued)

OGUNWOLE ET AL., 2020	**Viewpoint Paper**	1.Describe emerging data concerning racial disparities (and the related pathways for those disparities) in birth outcomes during the COVID-19 pandemic 2.Highlight how community-based doula services can disrupt the mechanisms leading to such disparities in COVID-19-related birth outcomes by proposing strategies for integrating doulas into health care teams and normalize recognizing them as essential health care workers.	N/A	Racism places residents of predominantly Black counties at higher risk of COVID-19 infection and chronic diseases. Because benefits of community doulas have not been deemed essential in hospital L&D settings, COVID-19 restrictions forced some women to choose between an often-unqualified partner/family member and their doula.	Health care systems should invest into and partner with community-based programs to promote health equity. Hospital policies should reflect doulas' designation as essential health care workers. Educate obstetric providers about the role of doulas, to enable partnerships that can improve birth outcomes

Table 1 characteristics of included studies. (continued)

PRATER ET AL., 2020 ***ST. LOUIS, MISSOURI***	**Cross-sectional Study** Affinia Healthcare a federally qualified health center serving historically marginalized populations. Total N= 97 Myanmar (n = 5), Afghanistan (n = 4) Nepal (n= 1) Total Black n (%) = 49 (51%) includin g Democratic Republic of Congo (n = 6) Somalia (n = 1)	1. Perceived discrimination measured with the 7-question Discrimination in the Medical Setting (DMS) survey. 2. Association between race and perceived discrimination, quality of care, trust of healthcare providers, and perceived control over medical choices relating to prenatal care and delivery.	DMS scores Multivariate logistic regression	Black women reported higher rates of ever feeling not listened to (20% vs 7%, p = 0.049).” Black women reported higher rates of perceived discrimination (31% vs 11%, aOR 3.9 [1.2–12.1], p < 0.05), lower control over health choices (84% vs 98%, aOR 0.1 [0.0–0.8], p < 0.05), and were more likely to perceive lack of respect (12% vs 2%, p = 0.045) compared to other women or color.	Higher rates of experienced discrimination compared to other women of color. HC decision making Trust

Table 1 characteristics of included studies. (continued)

SALEM ET AL., 2011 ***MINNESOTA***	**Prospective Cohort Study** A review of the medical records of all Somali women delivering at a single tertiary center between November 1994 -	1. Compare the cumulative incidence rate of a second child as well as the number of deliveries between the two modes of delivery (vag. c-section).	Cox Proportional Hazards Models Poisson Regression	68 (64%) had a vaginal delivery (Group 1) 38 (36%) had a cesarean delivery (Group 2)	Need for counseling Somali women about the potential delay in a second live birth after cesarean. Frank dialogue

	December 2007. Total N = 106 Somali immigrants.	2.Total number of children a woman delivered.		Somali women who had an initial vaginal delivery were 1.56 times (95%CI, 0.94-2.57; P = 0.084) more likely to have a subsequent delivery compared to women who had an initial cesarean section. No statistically significant association between the number of subsequent deliveries and the initial mode of delivery (rate ratio for vaginal vs. c-section = 1.35: 95%CI, 0.92-2.01: P = 0.09) when followed longitudinally over extended periods of time.	between physicians and Somali women Building trust and cultural competency through well guided counseling Addressing Somali women's concerns to ease transition into US healthcare system

Table 1 characteristics of included studies. (continued)

SPERLICH ET AL., 2017 ***MICHIGAN***	**Cross-sectional Study** A secondary analysis of data from	To answer the following questions: 1.Do White and Black women endorse feeling	Logistic Regression	Similar rates of feeling safest delivering in out-of-hospital settings Black	The disproportionately higher number of planned out-of-hospital births among

	interview responses and medical chart data collected during the NIH's STACY study ("Stress and the Childbearing Year") - a prospective, longitudinal study. Total N = 634 Total Black n (%) = 208 (32.8%)	safest giving birth outside of a hospital at different rates? 2.Do women who feel safest giving birth out-of-hospital differ from women who feel safest giving birth in a hospital based on other sociodemographic indicators such as age, income, education, insurance status, or living arrangements?		(11.5%) and White (13.1%). 80/634 (12.6%) of participants said they would feel safest delivering in out-of-hospital setting including birth centers, home or other. Significant variables associated with feeling safest delivering out-of-hospital were poverty ($15,000 annual income) and having an educational level above high school e.g., having a master's degree but low income.	White women in the US is not due to feelings about the safety of delivering out-of-hospital but more likely **differential access to and knowledge of such services.**

Table 1 characteristics of included studies. (continued)

SPERLICH ET AL., 2019 ***MICHIGAN***	**Cross-sectional Study** A secondary analysis of data from interview	1.Rates of preferring midwives over doctors 2.Rates of using midwives	Multivariate Logistic Regression	34.8% of Black women preferred midwives, compared to 23.7% of White	

	responses and medical chart data collected during the NIH's STACY study ("Stress and the Childbearing Year") - a prospective, longitudinal study. Total N = 645 completed late pregnancy interviews 564 completed six-week postpartum interviews Total Black n (%) = 214 (33.2%) completed late pregnancy interviews and 170 (30.1%) completed six-week postpartum interviews.	2.Rates of doula familiarity 3.Midwife preference 4.Doula care familiarity 5.Sociodemographic predictors of midwife use	women. Black women were attended by midwives 29.4% of their birth (and 67.7% by physicians), compared to white women, who had midwives available 18.5% of their birth. 36.8% of Black women had knowledge about doulas, compared to 85.7% of White women; though a similar rate of women from both race groups said they would consider a doula (61.6% white; 61.5% black). No statistical significance with race and midwifery preference. Lower educational levels were associated with preferring a midwife (33.9% of

				those with less than HS education preferred midwives, compared to 23.7% of those with higher than high school education).	

Table 1 characteristics of included studies. (continued)

TAYLOR ET AL., 2022 ***LOUISIANA***	**Retrospective Cohort Study** All patients who delivered at Woman's Hopsital in Baton Rouge, Louisiana between Oct. 2015 and Sept. 2020. Total N = 30,674 Total Black n (%) = 11,513 (37.5%)	1. Rates of postpartum hemorrhage (PPH) by demographics. 2.Predictive values for PPH by race 3.C-section and risk of PPH 4.Previous C-section risk of PPH	Multivariable Logistic Regression	Those who were obese, Black, Medicaid-eligible, and who did not have a previous cesarean delivery were more likely to experience PPH ($p<0.001$). Black women had greater odds of PPH (aOR= 1.23; 95%CI= 1.10-1.38)) compared to White women; among those who had a C-section, this association was slightly greater (aOR= 1.29; 95%CI= 1.13, 1.15). Having a c-section was the greatest	Severe maternal morbidity Pregnancy complications Association of Black race to risk of disease No mention of racism whatsoever

				predictor of PPH, with an odds ratio of 8.80 (95%CI= 7.73-10.01) compared to those who delivered vaginally. Having a previous cesarean delivery resulted in decreased odds of PPH in subsequent c-sections (aOR= 0.38; 95%CI= 0.32-0.44).	

Table 1 characteristics of included studies. (continued)

THOMAS ET AL., 2023 ***BROOKLYN, NEW YORK***	**Quasi-experimental matched cohort design** Total N = 2,412 (603 participated in in the By My Side doula program intervention; 1,809 who did not) **Matched using Natality Data* Total Black n (%) = 1,936 (80.2%) 484 (participated in By My Side program)	1. Preterm birth 2. Low birthweight 3.Cesarean birth by groups 4.Location of birth 5.Mode of delivery	Conditional and Multivariable Logistic Regression	Intervention group had significantly lower rates of preterm birth (5.6% vs. 11.9%, P<0.0001) and low birthweight (5.8% vs. 9.7%, P=.0031) compared to control group and significantly higher rates of giving birth outside of a hospital. 3.2% of By My Side participants used a birthing	Use of doula services associated with decreased odds of preterm birth, low birthweight, and safe out of hospital deliveries.

	1452 (did not participate)			facility, compared to 0.3% of non-participants (P<.0001), and 2.3% of By My Side participants gave birth at home, compared to 0.8% of non-participants (P<.0001). Adjusted analyses confirmed lower odds of preterm birth (aOR= 0.43; 95%CI= 0.29-0.63) and low birthweight (aOR= 0.57; 95%CI= 0.38-0.84) among intervention group compared to control group. No statistically significant associations between the intervention and primary cesarean deliveries.	

Table 1 characteristics of included studies. (continued)

	Diagnostic Test Accuracy Study	1.Birth setting 2.Race	No methods are used or described.	The VBAC calculator has been predominantly tested and	"Of course, racism has real health consequences, but if we

	Author describes the challenges with using a vaginal birth after cesarean delivery (VBAC) calculator.		validated at academic hospitals; rates of primary and repeat cesarean vary greatly by setting. The VBAC calculator only includes indicators from the woman giving birth, not the institutional or provider factors (e.g., guidance/advice, credentials, preferences, call schedules, patient volumes) and fails to address a woman's motivation for seeking a VBAC (which has previously been associated with success). Though no biological indicators for differences by race, the calculator accounts for the fact that just being a woman of color in the	restrict women's options based (in part) on known health disparities, we risk recreating them."

				US decreases odds of successful VBAC. This frame fails to address the differences between physiological and social indicators and thus, sustains narratives that social disadvantage is a neutral biological fact like age or height.	

Table 1 characteristics of included studies. (continued)

THORNTON P., 2018	**Systematic Review** Synthesizing recent US studies exploring the VBAC calculator.	1.Calculator development 2.Review of studies 3.Barriers and race	Narrative synthesis (not described).	Original development of the tool considered several risk factors, including Black/Hispanic race/ethnicity despite lack of biological predictors; systematic use of this tool could result in Black/Hispanic women being counseled against labor/vaginal birth, which is especially problematic given the higher rate of morbidity from C-	Need for research including large numbers of low scoring and racially minoritized patients in order to evaluate the effect of removing race on the VBAC calculator performance.

					section that many Black/Hispanic patients experience. Some studies reveal underestimation of success for VBAC among Hispanic and white individuals compared to Black individuals. One study demonstrated that Black parents were 3 times more likely to desire labor after cesarean (LAC) compared with White parents; 70% of Black parents in the same study rated the difficulty of finding LAC care 5/5, demonstrating the significant restriction of access to LAC for black families.

Table 1 characteristics of included studies. (continued)

VEDAM ET AL., 2018	**Scale Development** The study team created a scale to estimate midwife integration in hospital settings, then assessed the scale for validation and effect measures using the Delphi method.	Midwifery Integration Scoring System (MISS) 1.MISS scores and birth outcomes including (rates of spontaneous vaginal birth, exclusive breastfeeding, cesarean delivery, induction, VBAC, preterm birth, low birth weight, and neonatal mortality). 2.MISS scores by race/state (including state midwife density, and consumer access to midwives across birth settings (hospitals, home, birth centers).	Spearmen's Rho Correlation Coefficient	Higher MISS scores, and improved access to midwives in all settings, were associated with significantly higher rates of spontaneous vaginal delivery, VBAC, and breastfeeding at birth and six months; and significantly lower rates of C-section, preterm birth, and low birthweight. MISS scores, access to midwives, and density of midwives were significantly lower in states with a higher proportion of Black births (rs = -0.37, p=0.007; rs=-0.375, p=0.007; rs=-0.298, p=0.04 respectively). MISS scores did not significantly explain

				disparities in cesarean delivery and low birthweight.	

Table 1 characteristics of included studies. (continued)

VYAS ET AL. 2019	**Text and Opinion** Described the issues with incorporating race/ethnicity into VBAC calculations despite limited evidence of its impact on cesarean delivery and trial labor.	Narrative of the history of the VBAC predictor tool with explanations for the various factors that go into the tool's calculation.	N/A	The emphasis of the paper is that there is limited evidence that race/ethnicity would impact VBAC success (the author points to historically racist and anecdotal theories such as pelvic anatomy differences or suitability for vaginal birth). There are concerns with including race/ethnicity in the current models (i.e., ignoring the obvious sociopolitical mechanisms that intercede race and VBAC success; risking the continuance of these outcomes by systemizing the disparities). No biological	"Moreover, using incidence data to justify race-based correction is a circular argument: since the observational data reflected a snapshot in time, it is unsurprising that it revealed racial and ethnic disparities that are known to exist."

				plausibility for differences by race.	
WYCKOFF ET AL., 2020 *GAINESVILLE, FLORIDA*	**Retrospective Cohort Study** Total N = 201 Patients attempting a VBAC delivery at a single birth center. Total Black n (%) = 58 (28.8%)	1.VBAC prediction vs. actual occurrence 2.Prediction success by race	Exact Binomial Test	Study population had higher success in vaginal delivery than predicted from VBAC calculator. VBAC calculator had better prediction success in Black populations compared to White and Hispanic populations.	Need to use VBAC calculator with caution. Discussion about VBAC with patient should happen well before L&D

Appendix C: Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
TITLE			
Title	1	Identify the report as a scoping review.	19
ABSTRACT			
Structured summary	2	Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.	19
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach.	21
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives.	21
METHODS			
Protocol and registration	5	Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number.	N/A
Eligibility criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale.	22
Information sources*	7	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.	22
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	43
Selection of sources of evidence†	9	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review.	23
Data charting process‡	10	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.	26

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.	26
Critical appraisal of individual sources of evidence§	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate).	25
Synthesis of results	13	Describe the methods of handling and summarizing the data that were charted.	26
RESULTS			
Selection of sources of evidence	14	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	26
Characteristics of sources of evidence	15	For each source of evidence, present characteristics for which data were charted and provide the citations.	45
Critical appraisal within sources of evidence	16	If done, present data on critical appraisal of included sources of evidence (see item 12).	N/A
Results of individual sources of evidence	17	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.	27
Synthesis of results	18	Summarize and/or present the charting results as they relate to the review questions and objectives.	27-30
DISCUSSION			
Summary of evidence	19	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	33
Limitations	20	Discuss the limitations of the scoping review process.	33
Conclusions	21	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.	34
FUNDING			
Funding	22	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.	N/A

JBI = Joanna Briggs Institute; PRISMA-ScR = Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews.

* Where *sources of evidence* (see second footnote) are compiled from, such as bibliographic databases, social media platforms, and Web sites.

† A more inclusive/heterogeneous term used to account for the different types of evidence or data sources (e.g., quantitative and/or qualitative research, expert opinion, and policy documents) that may be eligible in a scoping review as opposed to only studies. This is not to be confused with *information sources* (see first footnote).

‡ The frameworks by Arksey and O'Malley (6) and Levac and colleagues (7) and the JBI guidance (4, 5) refer to the process of data extraction in a scoping review as data charting.
§ The process of systematically examining research evidence to assess its validity, results, and relevance before using it to inform a decision. This term is used for items 12 and 19 instead of "risk of bias" (which is more applicable to systematic reviews of interventions) to include and acknowledge the various sources of evidence that may be used in a scoping review (e.g., quantitative and/or qualitative research, expert opinion, and policy document).

From: Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMAScR): Checklist and Explanation. Ann Intern Med. 2018;169:467–473. doi: 10.7326/M18-0850.

CHAPTER 3: LABOR AND DELIVERY CHARACTERISTICS BY DETAILED MATERNAL NATIVITY ACROSS THE BLACK DIASPORA

Abstract

Of the 47 million Black people in the US, 10% are foreign-born mainly from the Caribbean and Sub-Saharan Africa (SSA) and are projected to account for a third of the US Black diaspora by 2060. Yet little is known about foreign-born Black women's labor and delivery (L&D) characteristics. This study aimed to examine the associations between detailed maternal nativity (DMN) and select L&D characteristics among US-born, Caribbean-born, SSA-born Black women in the US who had a birth between 2016 and 2020. Using Natality data, this secondary analysis included a final sample of 2,041,880 deliveries. The main exposure was DMN, and the outcomes of interest were birth attendant, place of delivery, and method of delivery.

Findings indicated that Caribbean-born women had increased odds of having a certified nurse midwife (CNM) at delivery compared to physician attended births, but Haitian-born and Jamaican-born women had reduced odds of having a certified professional midwife (CPM) at delivery. Cameroonian-born women had decreased odds of having a CNM or CPM at delivery. Foreign-born Black women overall had decreased odds of delivering in birthing centers or at home, except for Ghanaian-born women who had increased odds of having an unintended home delivery. All Caribbean-born women had increased odds of delivering via cesarean, while women born in most SSA countries had decreased odds of cesarean delivery. The findings suggest the need for more research and healthcare policies that consider the specific needs and preferences of different groups of pregnant women based on their ethnocultural origins. The study also highlights the importance of considering maternal nativity in healthcare planning to improve maternity care and prevent adverse maternal health outcomes. Further investigation and comprehensive data collection methods are recommended for future studies.

Keywords: maternal nativity, labor and delivery, Black women, US-born, Caribbean-born, Sub-Saharan African-born.

Introduction

Between 2017-2019, 84% of pregnancy-related deaths in the US were preventable.[1] It is well documented that Black women in the US are more than three times more likely to die in childbirth than their non-Black counterparts, even after adjusting for relevant social determinants of health such as age, socioeconomic status, and parity. [1–3] These disparities are likely due to a complex interplay of factors, including systemic racism, socioeconomic barriers, lack of access to quality healthcare [4] and immigration-related disadvantages.[5,6] However, one factor that may also contribute to these disparities is maternal nativity.

Black people are not a monolith therefore, culture, ethnicity, and immigration characteristics must be considered in the study of Black people's reproductive health. In 2019, 47 million people in the US identified as Black, constituting 14% of the total US population among which 4.6 million were foreign-born. [1–67] Among Black immigrants in the US, those who identify as Caribbean (46%) are the largest group, while Sub-Saharan African (SSA) (42%) immigrants account for the fastest growth in the Black immigrant population. Notwithstanding their contributions to the growing US Black Diaspora, Caribbean and SSA-born women are underrepresented in current maternity research and scientific literature.

Literature Review

The existing literature on associations between maternal nativity and labor and delivery (L&D) characteristics among Black women is limited. Most studies have used broad categories of maternal nativity, such as US-born versus foreign-born, and have not examined associations by specific countries of birth. [8–13] Additionally, most studies focus on adverse birth outcomes such as preterm birth and low birthweight,[14–16] while potential factors that may pertain to differences in L&D care, within the Black Diaspora such as the attendant at birth, the place and method of delivery, are not fully understood.

Birthing Attendance in the US

The birthing process can involve a diverse group of maternity care providers including obstetricians, family physicians, nurse-midwives, and doulas.[17] While the majority of births are attended by physicians, there's a notable state-by-state variation in the use of midwifery care.[18] Black mothers tend

to be less likely to have midwives attend their births compared to other racial groups.[19] Various certifications and regulations exist for midwives, affecting their scope of practice, autonomy, and prescriptive authority. The Midwifery Integration Scoring System (MISS) quantifies the integration of midwifery care and its impact, with findings suggesting that higher integration correlates with better maternal and neonatal outcomes.[20]

Place of Delivery in the US

The American College of Obstetricians and Gynecologists (ACOG) recognizes hospitals and birth centers as the safest places for delivery.[21] The majority of US deliveries (98.4%), occur in hospitals; however, home and standalone birthing center deliveries are growing.[22,23] While hospitals remain the dominant setting for childbirth, research indicates that neonatal mortality is more closely associated with the location of delivery than with the type of birth attendant.[24] Furthermore, studies have shown variations in maternal outcomes depending on the hospital's resources, practices, and care providers.[25,26]

Method of Delivery in the US

Despite the elevated maternal and neonatal morbidity and mortality risks associated with cesarean births, cesarean delivery rates in the US have consistently been considered too high over the last decade.[27–29] Between 2016-2020, Black births by cesarean have consistently accounted for approximately 36% of all US births, compared to their White and Hispanic counterparts who both consistently remained at approximately 31%.[30]

Gaps

The Black-White maternal disparities have been extensively documented in maternal health research.[31–49] Few studies have also reported that although Black immigrant women tend to have more favorable outcomes than their US-born counterparts, they are just as likely to develop gestational diabetes. Previous studies are limited in sample size and generalizability;[10,13,50–53] and, the associations between detailed maternal nativity (DMN) and L&D characteristics (including type of birth attendant, place, and method of delivery) among US-born, Caribbean-born, and SSA-born Black women remain underexplored. Disparities in maternal health between US-born and foreign-born Black

people are larger than nativity disparities among all other racialized populations (e.g., between US-born and foreign-born Asian populations).[54–58] The underlying factors contributing to these differences and the specific characteristics of L&D among Black women remain areas of research and concern.

Aims

Guided through the lens of the Andersen Behavioral Model of Health Services Use, [59,60] this study aimed to address the gaps of the existing literature by examining associations between DMN (i.e., mother's specific country of birth) and select L&D characteristics (i.e., type of birthing attendant, place of delivery, and method of delivery) of US-born, Caribbean-born, and SSA-born Black women in the US who had a birth between 2016 and 2020.

We first sought to understand the relationship between DMN and the attendant, place of delivery, and method of delivery. Three hypotheses were formed for each L&D characteristic. The second question aimed to assess differences in the L&D characteristics between Caribbean-born and SSA-born Black mothers in comparison to US-born Black mothers. It was hypothesized that Caribbean-born and Sub-Saharan Africa (SSA)-born women would have lower odds of being attended by midwives, to have home deliveries, and deliver via cesarean section compared to their US-born counterparts.

Methods

Data Source

The Centers for Disease Control and Prevention (CDC) National Center for Health Statistics (NCHS) collaborates with states to collect and publish data on vital statistics, including all US births annually. In 2003, the NCHS introduced a revised U.S. Standard Certificate of Live Birth, which brought significant changes and replaced the 1989 version. Vital statistics encompass all live births, death certificates, and fetal death reports.[61] Birth certificate data, often referred to as Natality data, records births within the US, covering US citizens, residents, and non-residents. These data are sourced from two main worksheets: the Mother's Worksheet [62] and the Facility Worksheet.[63] The Mother's Worksheet gathers information directly from the mother, including details such as race, Hispanic origin, and

education level.[62] On the other hand, the Facility Worksheet extracts data from the medical records of both the mother and infant, noting aspects like the date of the first prenatal care visit, maternal morbidity, and delivery method. [63] A detailed instruction manual was created to support hospital staff in filling out the Facility Worksheet.[64]

Public use Natality data, which encompasses Birth, Public use Birth, Period Linked Birth – Infant Death, Birth Cohort Linked Birth – Infant Death, Mortality Multiple Cause, and Fetal Death micro-data files, are available on the NCHS website.[61] However, due to confidentiality concerns, specific geographic data such as the state of residence or country of birth are limited.[65] To study the associations between DMN and L&D characteristics, access to the all-county restricted micro-data natality files for 2016 – 2020 was secured from NCHS.

Study Design & Population

The initial sample included non-Hispanic Black adult women of reproductive age (20-49), [66] who had a singleton birth in the US between 2016 and 2020 (n=2,556,727). Women who had missing data on their nativity status (n=9,085), were non-US residents (n=2,558), were born in regions other than the US, the Caribbean, or SSA (n=31,696), or did not have a singleton delivery (n= 108,428) were excluded. Women who had missing or incomplete information on the following independent variables were also excluded: US region of residence (n= 91,063), marital status (n= 80,157), mother's education (n= 16,400), parity (n= 7,582), BMI (n= 67,788), method of delivery (n= 773), prenatal care adequacy (n= 80,709), or previous cesarean (n= 1,206). Lastly, women whose place of delivery was unknown (n=1,674), and women whose attendant at birth was listed as "other" or "unknown" (n= 15,728) were excluded. The final sample included 2,041,880 deliveries.

Study Variables

Exposure Variable

The main exposure in this study was DMN, i.e., the mother's region and country of birth (Table 2.1. Appendix 2-A). The mother's detailed nativity was determined by the birth country variable available on the child's Birth Certificate Record. Black women who indicated being born in the Caribbean, or sub-

Saharan Africa were considered the exposed groups, and US-born Black women were considered unexposed. Individual countries with cell counts lower than 5,000 were collapsed into two composite variables called "All Other" for the Caribbean and SSA respectively. [67,68]

Outcome Variables

The outcome measures were the following delivery characteristics: the type of attendant at birth (i.e., physician, certified nurse midwife (CNM), or other midwife (CPM); the place of delivery (hospital, birthing center, home [intended], home birth [not intended], and the method of delivery (vaginal or cesarean).

Covariates

The covariates included maternal age (20-29, 30-39, 40-49), mother's education (some high school, high school graduate, some college, college degree, or unknown), marital status (married or unmarried), parity (1, 2, ≥3), gestational weight gain (according to the Institute of Medicine guidelines),[69] adequacy of prenatal care (adequate, intermediate, or inadequate), previous cesarean delivery, insurance type, US region of residence (Northeast, Midwest, South or West), and location of residence (urban vs rural). Prenatal care adequacy was measured using the Adequacy of Prenatal Care Utilization Index.[70,71] The month prenatal care began and the number of prenatal care visits variables were used to create the following categories: Adequate = began care between 1-4 months, and had at least 15 prenatal visits at 40 weeks, Inadequate = began care at or after the 5th month, and had ≤6 prenatal visits, Intermediate = began care between 1-4 months and had ≤11 prenatal visits.[67]

Statistical Analysis

US-born Black women were compared to Caribbean-born and SSA-born Black women. Comparisons were also made between Caribbean-born and SSA-born Black women and by maternal country of birth within the Caribbean and within SSA countries (e.g., Haiti vs All Other Caribbean, Nigeria vs All Other SSA).[67] To describe the sample, univariate analyses were conducted using frequencies for categorical variables and group differences were tested using Pearson Chi-square tests. Unadjusted odds ratios and 95% confidence intervals were calculated using multinomial regression to

obtain the crude association between DMN and the type of attendant at birth, and the place of delivery, and to determine other factors associated with these outcomes. Logistic regression was used to obtain the crude association between DMN and the method of delivery. Multivariate multinomial regression models were used to obtain adjusted odds ratios and 95% confidence intervals for the association between DMN and the type of attendant at birth (Table 2.4a Appendix 2-A), and the place of delivery (Table 2.4b Appendix 2-A) while controlling for potential confounders. Multivariate logistic regression was used for the adjusted odds ratios and 95% confidence intervals for the association between DMN and the method of delivery (Table 2.4c Appendix 2-A). Variables that changed the crude odds ratio estimates by a minimum of 10% were included in the multivariate models.[72] The DMN-attendant model was adjusted age, marital status, education, insurance, and region of residence in the US; the DMN-place model was adjusted for age, marital status, education, parity, gestational weight gain, prenatal care adequacy, insurance, and region of residence in the US; the DMN-method model for age, marital status, insurance, previous cesarean delivery. All analyses were conducted in SAS software version 9.4.[73]

Ethics

The UNC Charlotte Institutional Review Board (IRB) deemed this study exempt from needing IRB approval as there was no human participation. Following the submission of a brief proposal of research objectives, and a data security plan, NCHS granted access to the datasets.

Results

Univariate Analysis

Approximately 85% of the Black women who had a singleton delivery between 2016 and 2020 were US-born and 15% were foreign-born (Table 2.1 Appendix 2-A). Of the foreign-born women, 10.24% were from SSA, 4.87% from the Caribbean (Table 2.2a Appendix 2-A) with the highest number of births among them from women born in Nigeria and Haiti. The overall geographic distribution was predominantly in the[62] Southern US. Most US-born Black women giving birth were aged 20-29 (55.50%), 44.78% had some level of higher education, and 63.80% were unmarried. Among foreign-born Black

women, most were in the 30-39 age group (8.85%), 9.19% had some level of higher education, and 4.58% were unmarried. In the overall sample, 64.07% of the deliveries were covered by Medicaid. Ninety-one percent of all deliveries were attended by a physician, less than 1% occurred in out-of-hospital settings, 64.31% were vaginal and 35.68% cesarean deliveries.

Unadjusted Associations Between DMN and L&D Characteristics

Attendant at Birth

Overall, Caribbean-born Black women had increased odds of having either a CNM or a CPM at delivery compared to women who were attended by physicians. and these findings were statistically significant (ORs ranged from 1.30 - 2.31) (Table 2.3a Appendix 2-A). Among SSA-born women, Cameroonian-born Black women had decreased odds of having either a CNM (OR= 0.80; 95% CI: 0.73-0.86), or a CPM (OR= 0.80; 95% CI: 0.55-1.17), compared to US-born Black women who were attended by physicians. Ghanaian-born and Nigerian-born women had increased odds of having a CNM at delivery (OR(G)= 1.19; 95% CI: 1.15-1.24) and OR(N)=1.33; 95% CI: 1.25-1.42) respectively but decreased odds of having a CPM (OR(G)= 0.48; 95% CI: 0.36-0.64) and OR(N)=0.84; 95% CI: 0.58-1.21) respectively compared to women who were attended by physicians. and these findings were statistically significant.

Place of Delivery

Most foreign-born women had decreased odds of delivering in all three locations with a few exceptions. Jamaican-born women had statistically significant higher odds of having intended home deliveries (OR= 1.44; 95% CI: 1.16-1.80). All Other Caribbean-born women had 2.29 times the odds of delivering in a freestanding birthing center (95% CI: 1.87-2.81), and 2.16 times the odds of delivering at home (intentionally) (95% CI: 1.69-2.76) (Table 2.3b Appendix 2-A). Among the SSA-born, Nigerian-born women, had 74% increased odds of delivering in a freestanding birthing center (95% CI: 1.50-2.01).

Method of Delivery

Except for Black women born in All Other SSA (OR= 0.96; 95% CI: 0.94-0.98), Congo DRC (OR= 0.83; 95% CI: 0.80-0.86), Somalia (OR= 0.60; 95% CI: 0.58-0.61), and Sudan (OR= 0.86; 95% CI: 0.81-0.90), Black women born in All Other Caribbean, Haiti, Jamaica, Cameroon, Ethiopia, Ghana, Kenya, Liberia and Nigeria all had increased odds of delivering via cesarean section (ORs ranged 1.13 - 1.36) and these findings were statistically significant (Table 2.3c Appendix 2-A).

Adjusted Associations Between DMN and L&D Characteristics

Attendant at Birth

After adjusting for age, marital status, education, insurance, and region of residence in the US, Caribbean-born women continued to have increased odds of having a CNM at delivery at a reduced magnitude compared to women who had a physician attended birth (Table 2.4a Appendix 2-A). However, Haitian-born women now had 40% reduced odds of having a CPM at delivery (OR= 0.60; 95% CI: 0.53-0.69), and Jamaican-born women had 34% reduced odds of having a CPM at delivery (OR= 0.66; 95% CI: 0.56-0.77). The women in All Other Caribbean countries also had decreased odds of having a CPM at delivery but this finding was no longer statistically significant after adjustment (OR= 0.88; 95% CI: 0.74-1.05). The associations observed among Cameroonian-born women continued to demonstrate statistically significantly decreased odds of having either a CNM or CPM at delivery compared to women who had physician attended births, however, findings were attenuated after adjustment. After adjustment, Ghanaian-born and Nigerian-born women now had significantly decreased odds of having a CNM at delivery (OR(G)= 0.90; 95% CI: 0.85-0.95) and OR(N)= 0.67; 95% CI: 0.64-0.70; respectively) and decreased odds of having a CPM (OR(G)= 0.25; 95% CI: 0.18-0.34) and OR(N)= 0.15; 95% CI: 0.13-0.18; respectively) compared to women who were attended by physicians. and these findings were statistically significant.

Place of Delivery

After adjusting for age, marital status, education, parity, gestational weight gain, prenatal care

adequacy, insurance status and region of residence in the US, foreign-born Black women overall had decreased odds of delivering in freestanding birthing centers, and of having intended or unintended home deliveries except for Ghanaian-born women who had 1.13 times the odds of having an unintended home delivery (OR= 1.13; 95% CI: 0.68-1.87) (Table 2.4b Appendix 2-A). These findings differ from the unadjusted results where women born in All Other Caribbean countries had increased odds of delivering in freestanding birthing centers, and at home (intentionally) (Table 2.3b Appendix 2-A).

Method of Delivery

After adjusting for age, marital status, insurance status and previous cesarean delivery, women born in All Other SSA, DRC, Somalia, and Sudan continued to have statistically significant decreased odds of delivering via cesarean compared to women who delivered vaginally, although these findings were attenuated (Table 2.4c Appendix 2-A). All Caribbean-born women continued to have statistically significantly increased odds of delivering via cesarean, however, these associations were also attenuated after adjustment.

Discussion

Summary

This study explored the associations between DMN and three L&D characteristics including the attendant at birth, the place and method of delivery among US-born, Caribbean-born and SSA-born Black women who had a delivery in the US between 2016-2020. Contrary to the initial hypotheses, findings revealed that after adjusting for age, marital status, education, and insurance status, Caribbean-born women generally had increased odds of being attended by a CNM at delivery compared to U.S.-born women. In contrast, all foreign-born women had decreased odds of being attended by a CPM supporting our hypotheses. SSA-born women, particularly women from Cameroon, Ghana, Kenya, Liberia, Nigeria, and Somalia exhibited varying associations for the odds of being attended by a CNM. Cameroonian, Ghanaian, and Nigerian-born women had decreased odds of having a CNM at delivery whereas Kenyan, Liberian, and Somalian-born women had increased odds of being attended by a CNM.

Our hypothesis suggesting that Caribbean-born and SSA-born women would have lower odds of

having home births and delivering via cesarean respectively, was partially supported by the findings but differed when broken down by specific countries of origin. Overall, compared to US-born women, foreign-born women had decreased odds of delivering in freestanding birthing centers, and at home whether those home deliveries were intended or not. Most Caribbean-born women had statistically significantly increased odds of delivering via cesarean compared to US-born women. Among SSA-born women, Congolese, Somalian, Sudanese, and All Other SSA-born women had statistically significantly decreased odds of delivering via cesarean while Cameroonian, Ethiopian, Ghanaian and Kenyan-born women had slightly increased odds of cesarean delivery compared to US-born women.

Limitations & Strengths

This study has several limitations. One limitation is the potential for nondifferential misclassification, particularly regarding the intended place of birth and the type of birth attendant. Previous research suggests that midwife-attended birth numbers might be underreported on birth certificates, especially when multiple providers are present or when hospitals mandate listing a physician as the primary attendant regardless of their physical presence at midwife-attended births. [23,74–76] Thus, findings may be biased towards the null. Findings may have also been influenced by health selection bias. Specifically, Sub-Saharan African women might be more likely to migrate to the U.S. based on their health status, complicating interpretations of our findings. Additionally, this secondary data analysis was limited by the data collected on the birth certificates. Thus, confounding due to a variable not collected on birth certificates is possible.

Despite these limitations, this study had several strengths. First, the impact of DMN on L&D characteristics is under-researched and previous studies have typically dichotomized nativity status (US vs foreign-born). One prospective antenatal survey study published in 2010 assessed preferences in L&D practices (including method of delivery, choice of pain relief, place of delivery, position and mobility in labor) between pregnant Somali and Sudanese immigrants and US-born women (N=93), receiving care at a family practice in New York. [77] The results indicated differences in L&D preferences between US-Born and foreign-born women, however, most were not statistically significant and the authors did not

differentiate between White and Black US-born women.[77] In contrast, this study used a race-concordant sample in addition to the granular approach to nativity status and examined specific maternal countries of origin within the two regions contributing the highest number of Black immigrants in the US. This level of detail allows for more nuanced insights and helps to reduce overgeneralizations, as Black women are not a monolith.

Second, the consideration of multiple L&D characteristics including the attendant, the place and method of delivery provided a comprehensive picture of the childbirth experience with the US-Black Diaspora. Another of the study's strengths is our use of Natality U.S. Birth Certificate Data across all 50 states, enhancing the generalizability of the findings to U.S.-born, SSA-born, and Caribbean-born Black mothers who delivered in the U.S. between 2016 and 2020. The study's large sample size also addresses the limitations of previous studies that were limited by small samples. Furthermore, to our knowledge, this is the first study to examine the associations between DMN and L&D characteristics among a nationally representative sample of US-born, SSA-born, and Caribbean-born Black mothers.

Implications & Conclusions

These findings highlight the need for more nuanced research and healthcare policies that consider the specific needs and preferences of different groups of pregnant women based on their ethnocultural origins. The significant changes in some associations after adjustment suggest that public health interventions may need to account for these factors to be effective. For example, efforts to increase access to midwifery care should include support for building and diversifying the midwifery workforce, especially given that states with higher proportions of Black births have the lowest midwifery integration scores in the country. [20] Such efforts should also include providing education about the benefits of midwifery care and considering cost coverage for US-born and foreign-born Black women. Different cultural backgrounds might contribute to the differences in L&D characteristics we observed. Understanding the unique needs and experiences of US-born and foreign-born Black women can lead to improved quality of maternity care, patient satisfaction, and potentially eradicate preventable adverse maternal health outcomes. It is therefore crucial for providers to be able to consider nativity to assess,

recognize, and respect Black women's L&D preferences and needs.

Conclusions

This study underscores the necessity of considering maternal nativity in healthcare planning, especially in the context of L&D services among the growing US Black Diaspora. While we observed some trends consistent with our hypotheses, there were notable exceptions that warrant further investigation. Future studies should focus on more comprehensive data collection methods such as qualitative and mixed-methods research to delve deeper into the underlying mechanisms for the observed differences in L&D characteristics among US-born, Caribbean-born, and SSA-born Black women.

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Appendix 2-A

Table 2.1. Frequencies of US-born, Caribbean-born, and Sub-Saharan African (SSA)-born Black Women, 2016-2020 NCHS Natality Data.

Year	**N**	**(%)**
2016	417,540	(20.45)
2017	408,243	(19.99)
2018	406,264	(19.90)
2019	407,939	(19.98)
2020	401,894	(19.68)
Total	2,041,880	(100)
Mother's Birth Country		
US	1,732,603	(84.85)
Caribbean		
Anguilla	77	(0.00)
Antigua Barbuda	494	(0.02)
Aruba	23	(0.00)
Barbados	608	(0.03)
Belize	734	(0.03)
Brazil	1,056	(0.05)
Cayman Islands	84	(0.00)
Columbia	80	(0.00)
Cuba	89	(0.00)
Dominica	812	(0.04)
Dominican Republic	334	(0.02)
Ecuador	45	(0.00)
El Salvador	170	(0.01)
French Guyana	14	(0.00)
Grenada	550	(0.02)
Guadeloupe	79	(0.00)
Guatemala	278	(0.01)
Guyana	3,576	(0.16)
Haiti	**56,273**	**(2.53)**
Jamaica	**33,398**	**(1.50)**
Martinique	31	(0.00)
Netherland Antilles	7	(0.00)
Nicaragua	52	(0.00)

Table 2.1. Frequencies of US-born, Caribbean-born, and Sub-Saharan African (SSA)-born Black Women, 2016-2020 NCHS Natality Data (Continued).

Panama	348	(0.02)
Panama Canal Zone	5	(0.00)
Papua New Guinea	11	(0.00)
Paraguay	2	(0.00)
Peru	34	(0.00)
Saint Lucia	767	(0.03)
The Bahamas	3192	(0.14)
Trinidad and Tobago	4,579	(0.21)
Turks & Caicos Islands	253	(0.01)
Uruguay	10	(0.00)
Venezuela	100	(0.00)
Sub-Saharan Africa		
Angola	936	(0.04)
Benin	930	(0.04)
Botswana	134	(0.01)
Burkina Faso	1,187	(0.05)
Burundi	1,556	(0.07)
Cameroon	**10,686**	**(0.48)**
Cape Verde	3,613	(0.16)
Central African Republic	315	(0.01)
Chad	294	(0.01)
Comoros	17	(0.00)
Congo	3,623	(0.16)
Democratic Republic of Congo (DRC)	**11,639**	**(0.52)**
Cote D'Ivoire	3,060	(0.14)
Djibouti	510	(0.02)
Equatorial Guinea	225	(0.01)
Eritrea	5,182	(0.23)
Ethiopia	**32,360**	**(1.46)**
Gabon	432	(0.02)
Gambia	1940	(0.09)
Ghana	**18,410**	**(0.83)**
Guinea-Bissau	68	(0.00)
Kenya	**14,266**	**(0.64)**
Kingdom of eSwatini	36	(0.00)
Lesotho	27	(0.00)
Liberia	**10,877**	**(0.49)**
Madagascar	86	(0.00)
Malawi	345	(0.02)

Mali	1,286	(0.06)

Table 2.1. Frequencies of US-born, Caribbean-born, and Sub-Saharan African (SSA)-born Black Women, 2016-2020 NCHS Natality Data (Continued).

Maldives	1	(0.00)
Mauritius	16	(0.00)
Mozambique	89	(0.00)
Niger	568	(0.03)
Nigeria	**46,820**	**(2.11)**
Rwanda	1,566	(0.07)
Sao Tome & Principe	8	(0.00)
Senegal	3,065	(0.14)
Seychelles	10	(0.00)
Sierra Leone	4,297	(0.19)
Somalia	**28,069**	**(1.26)**
South Africa	1,065	(0.05)
SU Sudan	**7,349**	**(0.33)**
Tanzania	1,995	(0.09)
Togo	3,254	(0.15)
Uganda	3,037	(0.14)
Zambia	897	(0.04)
Zimbabwe	1,306	(0.06)

Table 2.2a. Comparison of Demographic Characteristics of US-born, Caribbean-born, and Sub-Saharan-born (SSA) Black Women, 2016-2020 NCHS Natality Data.

	US-born	**Foreign-born**	***p* value[a]**	**Caribbean**	**SSA**	***p* value[b]**
	N= 1,732,603 (84.85)	N= 339,614 (15.29)		N= 108,162 (4.87)	N= 227,455 (10.24)	
Variables						
Maternal Age			<.0001			<.0001
20-29	1,133,293 (55.50)	109,170 (5.35)		35,515 (1.74)	71,770 (3.51)	
30-39	555,363 (27.20)	180,674 (8.85)		55,707 (2.73)	123,458 (6.05)	
40-49	40,360 (1.98)	23,020 (1.13)		8,819 (0.43)	14,008 (0.69)	
Marital Status			<.0001			<.0001
Married	426,231 (20.87)	219,306 (10.74)		61,551 (3.01)	156,466 (7.66)	
Not Married	1,302,785 (63.80)	93,558 (4.58)		38,490 (1.89)	52,770 (2.58)	
Mother's Education			<.0001			<.0001
Less Than High School	170,420 (8.35)	43,776 (2.14)		10,110 (0.50)	33,532 (1.64)	
High School or GED	644,216 (31.55)	81,507 (3.99)		31,525 (1.54)	48,942 (2.40)	
Some College or College Degree	818,112 (40.07)	154,537 (7.57)		50,189 (2.46)	102,261 (5.01)	
Graduate Degree	96,268 (4.71)	33,044 (1.62)		8,217 (0.40)	24,501 (1.20)	
Parity			<.0001			<.0001
1	557,380 (27.30)	99,452 (4.87)		35,494 (1.74)	62,655 (3.07)	
2	513,880 (25.17)	95,231 (4.66)		32,665 (1.60)	61,495 (3.01)	
≥3	657,756 (32.21)	118,181 (5.79)		31,882 (1.56)	85,086 (4.17)	
Gestational Weight Gain			<.0001			<.0001
Met	462,284 (22.64)	96,853 (4.74)		30,120 (1.48)	65,705 (3.22)	
Below	415,501 (20.35)	91,424 (4.48)		27,189 (1.33)	63,413 (3.11)	
Exceeded	851,231 (41.69)	124,587 (6.10)		42,732 (2.09)	80,118 (3.92)	

Table 2.2a. Comparison of Demographic Characteristics of US-born, Caribbean-born, and Sub-Saharan-born (SSA) Black Women, 2016-2020 NCHS Natality Data (Continued).

Prenatal Care Adequacy			<.0001			<.0001
Adequate	1,166,950 (57.15)	191,456 (9.38)		64,183 (3.14)	124,850 (6.11)	
Intermediate	196,394 (9.62)	36,764 (1.80)		123,37 (0.60)	23,983 (1.17)	
Inadequate	365,672 (17.91)	84,644 (4.15)		23,521 (1.15)	60,403 (2.96)	
Insurance Type			<.0001			<.0001
Medicaid	1,148,367 (56.24)	159,960 (7.83)		49,090 (2.40)	108,973 (5.34)	
Private	495,305 (24.26)	108,746 (5.33)		36,528 (1.79)	70,843 (3.47)	
Self-Pay	24,327 (1.19)	31,135 (1.52)		10,016 (0.49)	21,045 (1.03)	
Other	61,017 (2.99)	13,023 (0.64)		4,407 (0.22)	8,375 (0.41)	
Region of Residence			<.0001			<.0001
Northeast	181,905 (8.91)	69,032 (3.38)		32,813 (1.61)	35,855 (1.76)	
Midwest	365,908 (17.92)	65,770 (3.22)		3,834 (0.19)	61,782 (3.03)	
South	1113632 (54.54)	153,968 (7.54)		61,544 (3.01)	89,481 (4.38)	
West	67,571 (3.31)	24,094 (1.18)		1,850 (0.09)	22,118 (1.08)	
Location of Residence			<.0001			<.0001
Urban	1,719,355 (84.20)	312,670 (15.31)		99,979 (4.90)	209,106 (10.24)	
Rural	9,661 (0.47)	194 (0.01)		62 (0.00)	130 (0.01)	
Previous Cesarean			<.0001			
Yes	317,643 (15.56)	62,925 (3.08)		18,013 (0.88)	44,292 (2.17)	
No	1,411,373 (69.12)	249,939 (12.24)		82,028 (4.02)	164,944 (8.08)	
Attendant Type			<.0001			<.0001
Physician/Doctor	1,588,198 (77.78)	278,686 (13.65)		87,072 (4.26)	188,472 (9.23)	
Certified Nurse-Midwife (CNM)	134,736 (6.60)	32,797 (1.61)		12,419 (0.61)	19,957 (0.98)	
Other Midwife (CPM)	6,082 (0.30)	1,381 (0.07)		550 (0.03)	807 (0.04)	
Place of Birth			<.0001			<.0001
Hospital	1,720,403 (84.26)	311,600 (15.26)		99,490 (4.87)	208,556 (10.21)	
Freestanding Birthing	4,239	667		275	374	

Center	(0.21)	(0.03)		(0.01)	(0.02)	

Table 2.2a. Comparison of Demographic Characteristics of US-born, Caribbean-born, and Sub-Saharan-born (SSA) Black Women, 2016-2020 NCHS Natality Data (Continued).

Home (intended)	3,078	439		232	195	
	(0.15)	(0.02)		(0.01)	(0.01)	
Home (not intended)	1,296	158		44	111	
	(0.06)	(0.01)		(0.00)	(0.01)	
Method of Delivery			<.0001			<.0001
Vaginal	1,117,992	195,256		60,360	132,620	
	(54.75)	(9.56)		(2.96)	(6.49)	
Cesarean	611,024	117,608		39,681	76,616	
	(29.92)	(5.76)		(1.94)	(3.75)	

[a] *p* values refer to a Pearson Chi-square test for the differences between US-born and Foreign-born Black Women.

[b] *p* values refer to a Pearson Chi-square test for the differences between Caribbean-born and SSA-born Black Women.

Table 2.2b. Comparison of Demographic Characteristics of Caribbean-born Black women by country of birth, 2016-2020 NCHS Natality Data.

	Haiti	Jamaica	All Other Caribbean	*p* value[a]
	N= 51,948 (2.54)	N= 31,112 (1.52)	N= 16,981 (0.83)	
Variables				
Maternal Age				<.0001
20-29	17,907 (0.88)	11,768 (0.58)	5,840 (0.29)	
30-39	29,214 (1.43)	29,214 (0.82)	9,815 (0.48)	
4049	4,827 (0.24)	2,666 (0.13)	1,326 (0.06)	
Marital Status				<.0001
Married	34,402 (1.68)	17,037 (0.83)	10,112 (0.50)	
Not Married	17,546 (0.86)	14,075 (0.69)	6,869 (0.34)	
Mother's Education				<.0001
Less Than High School	7,754 (0.38)	1,370 (0.07)	986 (0.05)	
High School or GED	18,347 (0.90)	8,644 (0.42)	4,534 (0.22)	
Some College or College Degree	23,614 (1.16)	17,609 (0.86)	8,966 (0.44)	
Graduate Degree	2,233 (0.11)	3,489 (0.17)	2,495 (0.12)	
Parity				<.0001
1	17,242 (0.84)	11,889 (0.58)	6,363 (0.31)	
2	16,705 (0.82)	10,261 (0.50)	5,699 (0.28)	
≥3	18,001 (0.88)	8,962 (0.44)	4,919 (0.24)	
Gestational Weight Gain				<.0001
Met	15,749 (0.77)	9,202 (0.45)	5,169 (0.25)	
Below	16,178 (0.79)	6,885 (0.34)	4,126 (0.20)	
Exceeded	20,021 (0.98)	15,025 (0.74)	7,686 (0.38)	
Prenatal Care Adequacy				<.0001
Adequate	32,140 (1.57)	20,928 (1.02)	11,115 (0.54)	
Intermediate	6,672 (0.33)	3,602 (0.18)	2,063 (0.10)	

Table 2.2b. Comparison of Demographic Characteristics of Caribbean-born Black women by country of birth, 2016-2020 NCHS Natality Data (Continued).

Inadequate	13,136	6,582	3,803	
	(0.64)	(0.32)	(0.19)	
Insurance Type				<.0001
Medicaid	30,047	12,782	6,261	
	(1.47)	(0.63)	(0.31)	
Private	14,690	13,867	7,971	
	(0.72)	(0.68)	(0.39)	
Self-Pay	5,384	2,801	1,831	
	(0.26)	(0.14)	(0.09)	
Other	1,827	1,662	918	
	(0.09)	(0.08)	(0.04)	
Region of Residence				<.0001
Northeast	15,911	11,668	5,234	
	(0.78)	(0.57)	(0.26)	
Midwest	1,562	1,413	859	
	(0.08)	(0.07)	(0.04)	
South	33,933	17,353	10,258	
	(1.66)	(0.85)	(0.50)	
West	542	678	630	
	(0.03)	(0.03)	(0.03)	
Location of Residence				<.0001
Urban	51,938	17	16,946	
	(2.54)	(1.52)	(0.83)	
Rural	10	31,095	35	
	(0.00)	(0.00)	(0.00)	
Previous Cesarean				<.0001
Yes	10,201	4,802 (0.24)	3,010	
	(0.50)		(0.15)	
No	41,747	26,310	13,971	
	(2.04)	(1.29)	(0.68)	
Attendant Type				<.0001
Physician/Doctor	44,393	27,510	15,169	
	(2.17)	(1.35)	(0.74)	
Certified Nurse-Midwife	7,297	3,444	1,678	
(CNM)	(0.36)	(0.17)	(0.08)	
Other Midwife (CPM)	258	158	134	
	(0.01)	(0.01)	(0.01)	
Place of Birth				<.0001
Hospital	51,755	30,921	16,814	
	(0.82)	(2.53)	(2.53)	
Freestanding Birthing	86	94	95	
Center	(0.00)	(0.00)	(0.00)	
Home (intended)	87	80	65	
	(0.00)	(0.00)	(0.00)	
Home (not intended)	20	17	7	
	(0.00)	(0.00)	(0.00)	
Method of Delivery				<.0001
Vaginal	30,667	19,256	10,437	

	(1.50)	(0.94)	(0.51)

Table 2.2b. Comparison of Demographic Characteristics of Caribbean-born Black women by country of birth, 2016-2020 NCHS Natality Data (Continued).

Cesarean	21,281	11,856	6,544
	(1.04)	(0.58)	(0.32)

[a] *p* values refer to a Pearson Chi-square test for the differences by maternal country of birth

Table 2.2c. Comparison of Demographic Characteristics of Sub-Saharan African (SSA)-born Black women by country of birth, 2016-2020 NCHS Natality Data.

	Cameroon	**DRC**	**Ethiopia**	**Kenya**	**Liberia**	**Ghana**	**Nigeria**	**Sudan**	**Somalia**	**All Other SSA**	***p* value** [a]
	N= 9,725 (0.48)	N= 11,039 (0.54)	N= 29,322 (1.44)	N= 13,143 (0.64)	N= 10,021 (0.49)	N= 17,233 (0.84)	N= 42,497 (2.08)	N= 6,793 (0.33)	N= 26,422 (1.29)	N= 43,041 (2.11)	
Variables											
Maternal Age											<.0001
20-29	3,614 (0.18)	5,393 (0.26)	8.977 (0.44)	5,612 (0.27)	4,255 (0.21)	4,516 (0.22)	10,404 (0.51)	2,378 (0.12)	9,727 (0.48)	16,894 (0.83)	
30-39	5,568 (0.27)	5,090 (0.25)	18,261 (0.89)	6,507 (0.32)	5,286 (0.26)	11,414 (0.56)	29,109 (1.43)	3,870 (0.19)	15,223 (0.75)	23,130 (1.13)	
40-49	543 (0.03)	556 (0.03)	2,084 (0.10)	1,024 (0.05)	480 (0.02)	1,303 (0.06)	2,984 (0.15)	545 (0.03)	1,472 (0.07)	3,017 (0.15)	
Marital Status											<.0001
Married	7,204 (0.35)	8,358 (0.41)	20,726 (1.02)	9,304 (0.46)	5,283 (0.26)	12,860 (0.63)	36,809 (1.80)	5,568 (0.27)	20,147 (0.99)	30,207 (1.48)	
Not Married	2,521 (0.12)	2,681 (0.13)	8,596 (0.42)	3,839 (0.19)	4,738 (0.23)	4,373 (0.21)	5,688 (0.28	1,225 (0.06)	6,275 (0.31)	12,834 (0.63)	
Mother's Education											<.0001
Less Than High School	293 (0.01)	3,008 (0.15)	4,852 (0.24)	987 (0.05)	1,078 (0.05)	486 (0.02)	902 (0.04)	1,336 (0.07)	12,932 (0.63)	7,658 (0.38)	
High School or GED	1,490 (0.07)	4,040 (0.20)	9,131 (0.45)	2,568 (0.13)	3,585 (0.18)	3,402 (0.17)	4,678 (0.23)	1,749 (0.09)	7,075 (0.35)	11,224 (0.55)	

Table 2.2c. Comparison of Demographic Characteristics of Sub-Saharan African (SSA)-born Black women by country of birth, 2016-2020 NCHS Natality Data (Continued).

Some College or College Degree	6,101 (0.30)	3,696 (0.18)	13,661 (0.67)	7,946 (0.39)	4,865 (0.24)	10,376 (0.51)	26,415 (1.29)	3,232 (0.16)	6,084 (0.30)	19,885 (0.97)	
Graduate Degree	1,841 (0.09)	295 (0.01)	1,678 (0.08)	1,642 (0.08)	493 (0.02)	2,969 (0.15)	10,502 (0.51)	476 (0.02)	331 (0.02)	4,274 (0.21)	
Parity											<.0001
1	3,392 (0.17)	3,051 (0.15)	9,527 (0.47)	402 (0.23)	2,532 (0.12)	5,665 (0.28)	14,413 (0.71)	1,445 (0.07)	3,804 (0.19)	14,124 (0.69)	
2	3,123 (0.15)	2,686 (0.13)	9,968 (0.49)	4,436 (0.22)	2,934 (0.14)	5,734 (0.28)	13,700 (0.67)	1,532 (0.08)	4,145 (0.20)	13,237 (0.65)	
≥3	3,210 (0.16)	5,302 (0.26)	9,827 (0.48)	4,005 (0.20)	4,555 (0.22)	5,834 (0.29)	14,384 (0.70)	3,816 (0.19)	18,473 (0.90)	15,680 (0.77)	
Gestational Weight Gain											<.0001
Met	2,769 (0.14)	3,399 (0.17)	10,192 (0.50)	4,318 (0.21)	2,898 (0.14)	5,374 (0.26)	13,504 (0.66)	2,049 (0.10)	7,915 (0.39)	13,287 (0.65)	
Below	1,826 (0.09)	3,785 (0.19)	8,733 (0.43)	4,157 (0.20)	2,579 (0.13)	4,349 (0.21)	10,610 (0.52)	2,623 (0.13)	11,451 (0.56)	13,300 (0.65)	
Exceeded	5,130 (0.25)	3,855 (0.19)	10,397 (0.51)	4,668 (0.23)	4,544 (0.22)	7,510 (0.37)	18,383 (0.90)	2,121 (0.10)	7,056 (0.35)	16,454 (0.81)	
Prenatal Care Adequacy											<.0001
Adequate	6,298 (0.31)	6,178 (0.30)	18,056 (0.88)	8,271 (0.41)	6,629 (0.32)	11,939 (0.58)	21,994 (1.08)	4,098 (0.20)	15,000 (0.73)	26,387 (1.29)	
Intermediate	1,001 (0.05)	1,025 (0.05)	3,637 (0.18)	1,645 (0.08)	1,255 (0.06)	1,788 (0.09)	3,747 (0.18)	820 (0.04)	4,508 (0.22)	4,557 (0.22)	

Inadequate	2,426 (0.12)	3,836 (0.19)	7,629 (0.37)	3,227 (0.16)	2,137 (0.10)	3,506 (0.17)	16,756 (0.82)	1,875 (0.09)	6,914 (0.34)	12,097 (0.59)	

Table 2.2c. Comparison of Demographic Characteristics of Sub-Saharan African (SSA)-born Black women by country of birth, 2016-2020 NCHS Natality Data (Continued).

Insurance Type											<.0001
Medicaid	4,662 (0.23)	7,409 (0.36)	16,647 (0.82)	5,837 (0.29)	5,442 (0.27)	6,786 (0.33)	13,668 (0.67)	4,138 (0.20)	21,734 (1.06)	22,650 (1.11)	
Private	3,994 (0.20)	2,440 (0.12)	10,729 (0.53)	6,030 (0.30)	3,718 (0.18)	8,385 (0.41)	14,307 (0.70)	2,090 (0.10)	430 (0.19)	15,320 (0.75)	
Self-Pay	545 (0.03)	926 (0.05)	989 (0.05)	705 (0.03)	436 (0.02)	1,139 (0.06)	12,501 (0.61)	369 (0.02)	3,830 (0.02)	3,005 (0.15)	
Other	524 (0.03)	264 (0.01)	957 (0.05)	571 (0.03)	425 (0.02)	923 (0.05)	2,021 (0.10)	196 (0.01)	428 (0.02)	2,066 (0.10)	
Region of Residence											<.0001
Northeast	1,170 (0.06)	1,522 (0.07)	2,865 (0.14)	2,223 (0.11)	2,737 (0.13)	5,365 (0.26)	6,106 (0.30)	947 (0.05)	2,009 (0.10)	10,911 (0.53)	
Midwest	1,670 (0.08)	3,397 (0.17)	7,803 (0.38)	4,250 (0.21)	3,970 (0.19)	3,382 (0.17)	6,709 (0.33)	2,332 (0.11)	18,126 (0.89)	10,143 (0.50)	
South	6,392 (0.31)	4,376 (0.21)	12,800 (0.63)	4,852 (0.24)	2,726 (0.13)	7,548 (0.37)	27,830 (1.36)	2,540 (0.12)	2,713 (0.13)	17,704 (0.87)	
West	493 (0.02)	1,744 (0.09)	5,854 (0.29)	1,818 (0.09)	588 (0.03)	938 (0.05)	1,852 (0.09)	974 (0.05)	3,574 (0.18)	4,283 (0.21)	
Location of Residence											<.0001
Urban	9,724 (0.48)	11,010 (0.54)	29,312 (1.44)	13,129 (0.64)	10,013 (0.49)	17,221 (0.84)	42,481 (2.08)	6,791 (0.33)	26,419 (1.29)	43,006 (2.11)	
Rural	1 (0.00)	29 (0.00)	10 (0.00)	14 (0.00)	8 (0.00)	12 (0.00)	16 (0.00)	2 (0.00)	3 (0.00)	35 (0.00)	
Previous Cesarean											<.0001
Yes	1,895 (0.09)	1,872 (0.09)	6,893 (0.34)	2,543 (0.12)	2,069 (0.10)	4,156 (0.20)	9,124 (0.45)	1,573 (0.08)	6,121 (0.30)	8,046 (0.39)	

No	7,830 (0.38)	9,167 (0.45)	22,429 (1.10)	10,600 (0.52)	7,952 (0.39)	13,077 (0.64)	33,373 (1.63)	5,220 (0.26)	20,301 (0.99)	34,995 (1.71)	

Table 2.2c. Comparison of Demographic Characteristics of Sub-Saharan African (SSA)-born Black women by country of birth, 2016-2020 NCHS Natality Data. (Continued)

Attendant Type											<.0001
Doctor	9,084 (0.44)	9,968 (0.49)	26,583 (1.30)	11,728 (0.57)	8,978 (0.44)	15,880 (0.78)	39,851 (1.95)	6,191 (0.30	21,844 (1.07)	38,365 (1.88)	
CNM	613 (0.03)	1024 (0.05)	2690 (0.13)	1354 (0.07)	1014 (0.05)	1316 (0.06)	2425 (0.12)	578 (0.03)	4545 (0.22)	4398 (0.22)	
CPM	28 (0.00)	47 (0.00)	49 (0.00)	61 (0.00)	29 (0.00)	37 (0.00)	221 (0.01)	24 (0.00)	33 (0.00)	278 (0.01)	
Place of Birth											<.0001
Hospital	9,703 (0.48)	11,026 (0.54)	29,274 (1.43)	13,081 (0.64)	10,001 (0.49	17,186 (0.84)	42,236 (2.07)	6,776 (0.33)	26,387 (1.29)	42,886 (2.10)	
Freestanding Birthing Center	12 (0.00)	4 (0.00)	23 (0.00)	32 (0.00)	12 (0.00)	20 (0.00)	181 (0.01)	8 (0.00)	14 (0.00)	68 (0.00)	
Home (intended)	7 (0.00)	3 (0.00)	10 (0.00)	23 (0.00)	6 (0.00)	11 (0.00)	66 (0.00)	4 (0.00)	7 (0.00)	58 (0.00)	
Home (not intended)	3 (0.00)	6 (0.00)	15 (0.00)	7 (0.00)	(0.00)	16 (0.00)	14 (0.00)	5 (0.00)	14 (0.00)	29 (0.00)	
Method of Delivery											<.0001
Vaginal	5,944 (0.29)	7,601 (0.37)	17,293 (0.85)	8,151 (0.40)	6,229 (0.31)	9,892 (0.48)	24,684 (1.21)	4,626 (0.23)	19,940 (0.98)	28,260 (1.38)	
Cesarean	3,781 (0.19)	3,438 (0.17)	12,029 (0.59)	4,992 (0.24)	3,792 (0.19)	7,341 (0.36)	17,813 (0.87)	2,167 (0.11)	6,482 (0.32)	14,781 (0.72)	

[a] *p* values refer to a Pearson Chi-square test for the differences by maternal country of birth

Table 2.3a: Unadjusted Odds Ratios and 95% Confidence Intervals for the Association between detailed maternal nativity and attendant at birth.

	Attendant at Birth (Ref. Physician)	
	Certified Nurse-Midwife (CNM) OR (95% CI)	**Other Midwife (CPM) OR (95% CI)**
Variables		
Mothers' Nativity		
Born in US	1.00 (Referent)	1.00 (Referent)
Foreign-Born	1.39 (1.37-1.41)	1.29 (1.22-1.37)
Mother's Birth Country		
US	1.00 (Referent)	1.00 (Referent)
Caribbean		
Haiti	1.94 (1.89-1.99)	1.52 (1.34-1.72)
Jamaica	1.47 (1.42-1.53)	1.50 (1.28-1.75)
All Other Caribbean	1.30 (1.24-1.37)	2.31 (1.94-2.74)
Sub-Saharan Africa		
Cameroon	0.80 (0.73-0.86)	0.80 (0.55-1.17)
DRC	1.21 (1.13-1.30)	1.23 (0.92-1.64)
Ethiopia	1.21 (1.13-1.30)	1.23 (0.92-1.64)
Ghana	1.19 (1.15-1.24)	0.48 (0.36-0.64)
Kenya	0.98 (0.92-1.03)	0.61 (0.44-0.84)
Liberia	1.36 (1.29-1.44)	1.36 (1.05-1.75)
Nigeria	1.33 (1.25-1.42)	0.84 (0.58-1.21)
Somalia	0.72 (0.69-0.75)	1.45 (1.26-1.65)
Sudan	2.45 (2.37-2.53)	0.39 (0.28-0.56)
All Other SSA	1.09 (1.01-1.19)	1.01 (0.68-1.51)
Maternal Age		
20-29	1.00 (Referent)	1.00 (Referent)
30-39	0.85 (0.84-0.86)	1.19 (1.14-1.25)
4049	0.65 (0.62-0.67)	0.80 (0.69-0.93)
Marital Status		
Married	1.17 (1.16-1.18)	2.46 (2.35-2.57)
Not Married	1.00 (Referent)	1.00 (Referent)
Mother's Education		
Less Than High School	1.07 (1.05-1.09)	0.34 (0.30-0.38)
High School or GED	1.01 (1.00-1.10)	0.48 (0.45-0.50)
Some College or College Degree	1.00 (Referent)	1.00 (Referent)
Graduate Degree	0.87 (0.85-0.89)	1.41 (1.31-1.51)

Table 2.3a: Unadjusted Odds Ratios and 95% Confidence Intervals for the Association between detailed maternal nativity and attendant at birth. (Continued).

Parity		
1	0.99 (0.98-1.00)	1.05 (1.00-1.11)
2	1.01 (1.00-1.02)	0.99 (0.93-1.04)
≥3	1.00 (Referent)	1.00 (Referent)
Gestational Weight Gain		
Met	1.01 (1.09-1.12)	1.14 (1.08-1.20)
Below	1.07 (1.06-1.08)	0.85 (0.80-0.90)
Exceeded	1.00 (Referent)	1.00 (Referent)
Prenatal Care Adequacy		
Adequate	1.00 (Referent)	1.00 (Referent)
Intermediate	1.14 (1.12-1.16)	0.89 (0.83-0.96)
Inadequate	1.07 (1.06-1.08)	1.12 (1.07-1.19)
Insurance Type		
Medicaid	1.00 (Referent)	1.00 (Referent)
Private	0.92 (0.91-0.93)	1.18 (1.11-1.25)
Self-Pay	1.21 (1.18-1.25)	14.15 (13.36-14.98)
Other	1.70 (1.65-1.73)	2.42 (2.19-2.68)
Region of Residence		
Northeast	1.61 (1.59-1.63)	0.58 (0.54-0.63)
Midwest	1.20 (1.18-1.21)	0.37 (0.34-0.40)
West	1.77 (1.73-1.81)	1.08 (0.98-1.19)
South	1.00 (Referent)	1.00 (Referent)
Location of Residence		
Urban	1.00 (Referent)	1.00 (Referent)
Rural	0.60 (0.55-0.65)	0.37 (0.22-0.63)
Previous Cesarean		
Yes	0.16 (0.16-0.17)	0.18 (0.16-0.20)
No	1.00 (Referent)	1.00 (Referent)

p value <0.05

Table 2.3b: Unadjusted Odds Ratios and 95% confidence intervals for the association between detailed maternal nativity and place of delivery.

	Place of Delivery (Ref. Hospital)		
	Freestanding Birthing Center	**Home (intended)**	**Home (unintended)**
Variables	**OR (95% CI)**	**OR (95% CI)**	**OR (95% CI)**
Mothers Nativity			
US Born	1.00 (Referent)	1.00 (Referent)	1.00 (Referent)
Foreign Born	0.87 (0.80-0.94)	0.79 (0.71-0.87)	0.67 (0.57-0.80)
Mother's Birth Country			
US	1.00 (Referent)	1.00 (Referent)	1.00 (Referent)
	Caribbean		
Haiti	0.67 (0.54-0.83)	0.94 (0.76-1.16)	0.51 (0.33-0.80)
Jamaica	1.23 (1.00-1.51)	1.44 (1.16-1.80)	0.73 (0.45-1.18)
All Other Caribbean	2.29 (1.87-2.81)	2.16 (1.69-2.76)	0.55 (0.26-1.16)
	Sub-Saharan Africa		
Cameroon	0.50 (0.28-0.88)	0.40 (0.19-0.85)	0.41 (0.13-1.27)
DRC	0.15 (0.06-0.39)	0.15 (0.05-0.47)	0.72 (0.32-1.61)
Ethiopia	0.32 (0.21-0.48)	0.19 (0.10-0.36)	0.68 (0.41-1.13)
Ghana	0.47 (0.30-0.73)	0.36 (0.20-0.65)	1.24 (0.75-2.02)
Kenya	0.99 (0.70-1.40)	0.98 (0.65-1.48)	0.27 (0.07-1.06)
Liberia	0.49 (0.28-0.86)	0.34 (0.15-0.75)	0.27 (0.07-1.06)
Nigeria	1.74 (1.50-2.01)	0.87 (0.68-1.11)	0.44 (0.26-0.75)
Somalia	0.22 (0.13-0.36)	0.15 (0.07-0.31)	0.70 (0.42-1.19)
Sudan	0.48 (0.24-0.96)	0.33 (0.12-0.88)	0.98 (0.41-2.36)
All Other SSA	0.64 (0.51-0.82)	0.76 (0.58-0.98)	0.90 (0.62-1.30)
Maternal Age			
20-29	1.00 (Referent)	1.00 (Referent)	1.00 (Referent)
30-39	1.25 (1.19-1.33)	1.88 (1.76-2.01)	1.03 (0.92-1.14)
40-49	0.50 (0.40-0.63)	1.66 (1.40-1.98)	0.64 (0.44-0.93)
Marital Status			
Married	2.95 (2.79-3.12)	5.22 (4.86-5.62)	0.71 (0.63-0.80)
Not Married	1.00 (Referent)	1.00 (Referent)	1.00 (Referent)
Mother's Education			
Less Than High School	0.09 (0.07-0.11)	0.07 (0.05-0.09)	1.79 (1.54-2.08)
High School or GED	0.27 (0.24-0.29)	0.21 (0.19-0.23)	1.24 (1.10-1.40)
Some College or College Degree	1.00 (Referent)	1.00 (Referent)	1.00 (Referent)
Graduate Degree	1.90 (1.76-2.05)	2.01 (1.84-2.19)	0.97 (0.76-1.23)

Table 2.3b: Unadjusted Odds Ratios and 95% confidence intervals for the association between detailed maternal nativity and place of delivery (Continued).

Parity			
1	1.49 (1.39-1.59)	0.70 (0.64-0.76)	0.37 (0.32-0.43)
2	1.32 (1.23-1.42)	0.84 (0.77-0.91)	0.70 (0.61-0.78)
≥3	1.00 (Referent)	1.00 (Referent)	1.00 (Referent)
Gestational Weight Gain			
Met	1.05 (0.98-1.12)	1.17 (1.09-1.26)	1.52 (1.33-1.74)
Below	0.73 (0.68-0.79)	0.75 (0.68-0.82)	2.44 (2.16-2.76)
Exceeded	1.00 (Referent)	1.00 (Referent)	1.00 (Referent)
Prenatal Care Adequacy			
Adequate	1.00 (Referent)	1.00 (Referent)	1.00 (Referent)
Intermediate	0.93 (0.85-1.02)	0.81 (0.72-0.91)	1.50 (1.26-1.77)
Inadequate	0.95 (0.88-1.02)	1.08 (1.00-1.17)	2.84 (2.54-3.17)
Insurance Type			
Medicaid	1.00 (Referent)	1.00 (Referent)	1.00 (Referent)
Private	2.01 (1.89-2.14)	2.15 (1.94-2.37)	0.71 (0.63-0.81)
Self-Pay	9.65 (8.89-10.48)	59.74 (54.90-70.00)	2.29 (1.85-2.84)
Other	1.35 (1.14-1.58)	2.80 (2.31-3.39)	1.03 (0.79-1.34)
Region of Residence			
Northeast	0.91 (0.84-0.99)	0.70 (0.63-0.79)	1.49 (1.29-1.73)
Midwest	0.25 (0.23-0.28)	0.60 (0.55-0.66)	1.44 (1.27-1.62)
West	1.27 (1.13-1.42)	2.58 (2.33-2.86)	0.79 (0.59-1.07)
South	1.00 (Referent)	1.00 (Referent)	1.00 (Referent)
Location of Residence			
Urban	1.00 (Referent)	1.00 (Referent)	1.00 (Referent)
Rural	0.25 (0.11-0.56)	0.18 (0.06-0.55)	1.42 (0.76-2.65)
Previous Cesarean			
Yes	0.069 (0.05-0.09)	0.31 (0.27-0.36)	0.29 (0.23-0.36)
No	1.00 (Referent)	1.00 (Referent)	1.00 (Referent)

p value <0.05

Table 2.3c: Unadjusted Odds Ratios and 95% Confidence Intervals for the association between detailed maternal nativity and method of delivery.

	Method of Delivery (Ref. Vaginal) Cesarean
Variables	**OR (95% CI)**
Mothers Nativity	
US Born	1.00 (Referent)
Foreign Born	0.87 (0.80-0.94)
Mother's Birth Country	
US	1.00 (Referent)
Caribbean	
Haiti	1.27 (1.25-1.29)
Jamaica	1.13 (1.10-1.15)
All Other Caribbean	1.15 (1.11-1.18)
Sub-Saharan Africa	
Cameroon	1.16 (1.12-1.21)
DRC	0.83 (0.80-0.86)
Ethiopia	1.27 (1.24-1.30)
Ghana	1.36 (1.32-1.40)
Kenya	1.12 (1.08-1.16)
Liberia	1.11 (1.07-1.16)
Nigeria	1.32 (1.30-1.35)
Somalia	0.60 (0.58-0.61)
Sudan	0.86 (0.81-0.90)
All Other SSA	0.96 (0.94-0.98)
Maternal Age	
20-29	1.00 (Referent)
30-39	1.57 (1.56-1.58)
40-49	2.46 (2.42-2.50)
Marital Status	
Married	1.20 (1.19-1.21)
Not Married	1.00 (Referent)
Mother's Education	
Less Than High School	0.84 (0.83-0.85)
High School or GED	0.88 (0.87-0.88)
Some College or College Degree	1.00 (Referent)
Graduate Degree	1.29 (1.28-1.31)

Table 2.3c: Unadjusted Odds Ratios and 95% Confidence Intervals for the association between detailed maternal nativity and method of delivery (Contitnued).

Parity	
1	1.08 (1.07-1.09)
2	1.11 (1.11-1.12)
≥3	1.00 (Referent)
Gestational Weight Gain	
Met	0.79 (0.78-0.79)
Below	0.73 (0.73-0.74)
Exceeded	1.00 (Referent)
Prenatal Care Adequacy	
Adequate	1.00 (Referent)
Intermediate	0.82 (0.82-0.83)
Inadequate	0.85 (0.84-0.86)
Insurance Type	
Medicaid	1.00 (Referent)
Private	1.21 (1.21-1.22)
Self-Pay	0.89 (0.88-0.91)
Other	0.94 (0.93-0.96)
Region of Residence	
Northeast	0.91 (0.89-0.92)
Midwest	0.80 (0.79-0.81)
South	1.00 (Referent)
West	0.91 (0.89-0.92)
Location of Residence	
Urban	1.00 (Referent)
Rural	1.13 (1.08-1.18)
Previous Cesarean	
Yes	20.98 (20.77-21.19)
No	1.00 (Referent)

p value <0.05

Table 2.4a: Adjusted Odds Ratios and 95% Confidence Intervals for the association between detailed maternal nativity and attendant at birth.

	Attendant at Birth (Ref. Physician)	
	Certified Nurse-Midwife	**Other Midwife (CPM)**
Variables	**OR 95% CI**	**OR 95% CI**
Mother's Birth Country		
US	1.00 (Referent)	1.00 (Referent)
	Caribbean	
Haiti	1.86 (1.81-1.91)	0.60 (0.53-0.69)
Jamaica	1.38 (1.33-1.43)	0.66 (0.56-0.77)
All Other Caribbean	1.24 (1.18-1.31)	0.88 (0.74-1.05)
	Sub-Saharan Africa	
Cameroon	0.77 (0.71-0.84)	0.31 (0.22-0.46)
DRC	1.05 (0.98-1.12)	0.54 (0.40-0.72)
Ethiopia	1.11 (1.07-1.16)	0.31 (0.23-0.41)
Ghana	0.90 (0.85-0.95)	0.25 (0.18-0.34)
Kenya	1.22 (1.15-1.29)	0.67 (0.52-0.87)
Liberia	1.20 (1.12-1.28)	0.64 (0.44-0.92)
Nigeria	0.67 (0.64-0.70)	0.15 (0.13-0.18)
Somalia	2.20 (2.12-2.28)	0.53 (0.38-0.75)
Sudan	0.99 (0.91-1.08)	0.49 (0.33-0.74)
All Other SSA	1.20 (1.16-1.24)	0.88 (0.78-1.00)

Model adjusted for age, marital status, education, insurance, and region of residence in the US.
p value <0.05

Table 2.4b: Adjusted Odds Ratios and 95% confidence intervals for the association between detailed maternal nativity and attendant at birth.

	Place of Delivery (Ref. Hospital)		
Variables	**Freestanding Birthing Center OR (95% CI)**	**Home (intended) OR (95% CI)**	**Home (unintended) OR (95% CI)**
Mother's Birth Country			
US	1.00 (Referent)	1.00 (Referent)	1.00 (Referent)
		Caribbean	
Haiti	0.31 (0.25-0.39)	0.18 (0.15-0.23)	0.43 (0.27-0.68)
Jamaica	0.54 (0.44-0.66)	0.32 (0.25-0.40)	0.68 (0.42-1.11)
All Other Caribbean	0.92 (0.74-1.13)	0.40 (0.31-0.52)	0.50 (0.24-1.06)
		Sub-Saharan Africa	
Cameroon	0.19 (0.11-0.33)	0.06 (0.03-0.13)	0.43 (0.14-1.34)
DRC	0.08 (0.03-0.21)	0.03 (0.01-0.08)	0.53 (0.24-1.18)
Ethiopia	0.21 (0.14-0.31)	0.06 (0.03-0.12)	0.65 (0.39-1.09)
Ghana	0.17 (0.11-0.27)	0.05 (0.03-0.09)	1.13 (0.68-1.87)
Kenya	0.48 (0.34-0.68)	0.20 (0.13-0.30)	0.64 (0.31-1.36)
Liberia	0.38 (0.22-0.67)	0.12 (0.05-0.27)	0.22 (0.05-0.87)
Nigeria	0.20 (0.17-0.24)	0.02 (0.02-0.03)	0.27 (0.16-0.47)
Somalia	0.41 (0.24-0.70)	0.13 (0.06-0.28)	0.45 (0.26-0.77)
Sudan	0.25 (0.13-0.51)	0.05 (0.02-0.14)	0.74 (0.31-1.79)
All Other SSA	0.31 (0.24-0.40)	0.14 (0.10-0.18)	0.72 (0.50-1.06)

Model adjusted for age, marital status, education, parity, gestational weight gain, prenatal care adequacy, insurance, and region of residence in the US.
p value <0.05

Table 2.4c: Adjusted Odds Ratios and 95% Confidence Intervals for the Association between detailed maternal nativity and method of delivery.

	Method of Delivery (Ref. Vaginal)
	Cesarean
Variables	**OR (95% CI)**
Mother's Birth Country	
US	1.00 (Referent)
Caribbean	
Haiti	1.10 (1.06-1.14)
Jamaica	1.24 (1.21-1.27)
All Other Caribbean	1.16 (1.13-1.20)
Sub-Saharan Africa	
Cameroon	1.10 (1.05-1.15)
DRC	0.82 (0.79-0.86)
Ethiopia	1.06 (1.03-1.09)
Ghana	1.09 (1.05-1.13)
Kenya	1.03 (0.99-1.07)
Liberia	1.00 (0.95-1.05)
Nigeria	1.24 (1.22-1.28)
Somalia	0.37 (0.36-0.38)
Sudan	0.62 (0.58-0.66)
All Other SSA	0.87 (0.85-0.89)

Model adjusted for age, marital status, insurance status and previous cesarean delivery
p value <0.05

CHAPTER 4: PREGNANCY COMPLICATIONS BY DETAILED MATERNAL NATIVITY ACROSS THE BLACK DIASPORA. DOES MATERNAL COUNTRY OF BIRTH MATTER?

Abstract

Even though 84% of all pregnancy-related deaths in the US are preventable, Black women are more likely to die from pregnancy-related complications than their counterparts of other races. The purpose of this study was to examine the differences in pregnancy complications among US-born, Caribbean-born, and Sub-Saharan Africa (SSA)-born Black women who give birth in the US.

This was a secondary data analysis of US Natality data including non-Hispanic Black women aged 20-49 who had a singleton birth between 2016 and 2020 (n=2,059,282). The main exposure variable was detailed maternal nativity (DMN), defined as the mother's specific country of birth. The outcome measures were gestational hypertension, eclampsia, and gestational diabetes.

Consistent with previous research, findings suggest that foreign-born Black women had lower odds of gestational hypertension and eclampsia, but higher odds of gestational diabetes compared to US-born Black women. Among SSA-born women, only those from Cameroon and Nigeria had reduced odds of gestational diabetes. Caribbean-born women maintained higher odds of gestational diabetes compared to US-born Black women, although these odds were attenuated after adjustment.

Implications for healthcare practice highlight the need for proactive counseling and preventative measures for specific groups within the Black Diaspora. Findings also emphasize the importance of collecting and analyzing data at more granular levels to understand the diverse experiences and mechanisms influencing pregnancy and birth outcomes for all Black women in the US. Thus, future research should consider using qualitative and mixed-methods designs to examine the roles of socio-economic, political, cultural, behavioral, and environmental factors on these pregnancy complications.
Keywords: Black women, gestational hypertension, eclampsia, gestational diabetes, nativity, Caribbean-born, Sub-Saharan African-born.

Introduction

A 2022 Maternal Mortality Review Committees report revealed that between 2017 and 2019, 84% of pregnancy-related deaths in the US were preventable.[1] Among those preventable deaths, 22% occurred during pregnancy, 25% on the day of delivery or within seven days postpartum, and 53% between seven days to one year postpartum.[1] Hypertensive disorders are associated with a four-fold increased risk of heart disease and stroke, and accounted for 7% of all pregnancy-related deaths.[2] Black women in the US experience three to four times the risk of dying from pregnancy-related complications including hypertensive disorders such as preeclampsia, eclampsia, and gestational hypertension, as well as gestational diabetes, even after adjusting for relevant social determinants of health such as age, socio-economic status, and parity.[3]

Pregnancy Hypertension and Gestational Diabetes

Gestational hypertension refers to elevated blood pressure (≥ 140/90 mmHg), that develops in previously normotensive women after the 20th week of pregnancy. Gestational hypertension occurs without proteinuria (protein presence in urine), and typically does not last past the delivery.[1] Preeclampsia and eclampsia are hypertensive conditions marked by proteinuria that occur during pregnancy, usually after the 20th week or after delivery.[4,5] Preeclampsia results in a reduced flow of oxygenated blood and other nutrients to the fetus and when progressed into eclampsia can lead to severe conditions such as seizures, coma, and death.[5] It is estimated that 3.4% of pregnancies in the US are affected by preeclampsia, leading to 15% of all premature births.[4] Diabetes Mellitus is a condition that occurs when sugar (glucose) levels in the blood are elevated.[6] Pre-pregnancy or preexisting diabetes differs from gestational diabetes, which develops during pregnancy.[6] Gestational diabetes mellitus (GDM) is often diagnosed between the 24th and 28th week of gestation and usually goes away after pregnancy. If left untreated, GDM may lead to premature births or stillbirths and can also make mothers more likely to have diabetes after pregnancy.[7] In the US, two to ten percent of pregnancies are affected by GDM yearly and 50% of women with gestational diabetes later develop type 2 diabetes.[8] Black women in the US are disproportionately affected by preeclampsia, eclampsia and GDM; however, race alone does not account

for this. Despite the seemingly protective factor that foreign-born status has been associated with, immigrant Black women are more likely than US-born Black women to develop GDM.[9]

Notwithstanding the fact that 84% of all pregnancy-related deaths in the US are preventable, many studies have demonstrated that Black women are three to four times more likely to die from pregnancy-related complications than their White counterparts. [10–20] Both preeclampsia and GDM have been associated with an increased risk of cardiovascular disease and heart failure within seven years after pregnancy.[21–23] In a study of racial and ethnic disparities between 2016 to 2017, the maternal mortality rate (MMR) for US Black mothers was four times higher (MMR=3.55) than that of their White counterparts (MMR=1.11). A couple of the leading causes of maternal death contributing to the Black-White maternal mortality disparity were preeclampsia and eclampsia (22.1%) and cardiomyopathy (a chronic heart muscle condition) (19.1%).[14] Authors suggested that reducing the Black MMR for preeclampsia, eclampsia, and cardiomyopathy to White levels, would reduce the Black-White maternal mortality disparity to 52.2%.[14] A potential strategy to do so is to standardize care by implementing safety bundles that include provider and staff education on hypertension, protocols, and treatments for pregnant women with hypertension during labor and delivery (L&D).[24]

Although the White-Black maternal disparities have been extensively documented, disparities within the US Black diaspora by nativity status have not been sufficiently and exclusively examined. Disparities in maternal morbidity and mortality between US-born and foreign-born Black people are larger than nativity disparities among all other racialized populations (e.g., between US-born and foreign-born Asian populations).[11,25–28] For example, in a review of research published on Black nativity and health disparities, 14 local and national studies consistently revealed that immigrant Black mothers had lower rates of adverse birth outcomes compared to their US-born counterparts, whereas only one study using Census data revealed similar rates of adverse birth outcomes between immigrant and US-born Black mothers. [3925,26,29–40] Recent research suggests that Caribbean and African immigrants tend to have better birth outcomes (i.e. lower rates of preterm births and longer gestation) and lower odds of certain pregnancy complications than their US-born counterparts due to a phenomenon called the “healthy

migrant effect".[41] The healthy migrant effect is the theory that women who migrate are healthier and therefore have better reproductive outcomes than women who do not migrate.[42]

However, international research findings demonstrate that the protective factor associated with the healthy migrant effect might not apply to pregnancy complications. A study of preeclampsia and eclampsia among immigrant women giving birth in Australia, Canada, Spain, the US, Denmark, and Sweden between 1995-2010 revealed that compared to Western European immigrants, immigrants from SSA, Latin America and the Caribbean were more likely to have preeclampsia and eclampsia.[43] These findings were adjusted for parity, maternal age, and destination country. The authors concluded that immigrant women from SSA, and Latin America, and the Caribbean require increased surveillance due to consistently being placed at higher risk of preeclampsia and eclampsia.[43]

Conceptual Framework

The Andersen Behavioral Model of Health Services Use focuses on improving access to care by emphasizing contextual and individual characteristics which affect the utilization of healthcare services and ultimately health outcomes (Figure 1).[44,45] Both the contextual and individual characteristics are comprised of predisposing factors (that predispose individuals to seek care); enabling factors (that increase or hinder the use of care); need characteristics (an individual's need for care); and personal health practices (diet, substance use, and the use of formal healthcare services).[44]

Purpose

The US has long been home to a diverse population of Black women, including those who are US-born, as well as rising in immigration from countries in the Caribbean and Sub-Saharan Africa (SSA). Few studies offer a comprehensive view that compare differences within the Black Diaspora by country of birth, especially concerning pregnancy complications.[30,41,46–48] This paper seeks to fill this gap in the literature by examining the differences in gestational hypertension, eclampsia, and gestational diabetes among US-born, Caribbean-born, and SSA-born Black women who delivered in the US between 2016-2020. It was hypothesized that foreign-born women might experience lower instances of gestational hypertension and eclampsia but might have increased occurrences of gestational diabetes compared to

US-born women. It was also hypothesized that relative to US-born Black women, SSA-born women might face higher risks of gestational hypertension, eclampsia, and gestational diabetes than their Caribbean-born counterparts and lastly that the odds of pregnancy complications would differ across countries within the two regions separately. Given the growing US Black Diaspora and the impact of health during pregnancy on both maternal and neonatal outcomes, the results of this research are pivotal for healthcare professionals, policymakers, and researchers alike. To our knowledge, no other study has examined the associations between detailed maternal nativity, and gestational hypertension, eclampsia, and gestational diabetes among US-born, Caribbean-born, and SSA-born Black mothers in the US.

Methods

Data Source

The Centers for Disease Control and Prevention (CDC) National Center for Health Statistics (NCHS), in collaboration with states, collects and publishes national data on vital statistics including all births occurring in the US every year. Vital statistics data include all live birth and death certificates and the report of fetal deaths.[49] Birth certificate data, also known as Natality data, captures births occurring in the US to US citizens, residents, and non-residents. Natality data are collected from two worksheets: the Mother's Worksheet which collects the mothers 'self-reported demographic information including race, Hispanic origin, and educational level.[50] The second is the Facility Worksheet which is filled out by qualified staff with data collected from the medical records of the mother and the infant including items such as date of first prenatal care visit, maternal morbidity, and method of delivery.[51] A detailed instruction manual was created to aid hospital employees in filling out the Facility Worksheet.[52]

Public use Natality data files can be downloaded from the NCHS website, however, due to confidentiality standards, specific geographic data such as state of residence or country of birth are restricted. Thus, to examine differences in pregnancy complications by DMN, all-county restricted micro-data natality files for 2016 – 2020 from NCHS were requested for this analysis.

Study Design & Population

The sample included non-Hispanic Black adult women of reproductive age, (20-49) [53] who had a

singleton birth in the US between 2016 and 2020 (n=2,556,727). Women who had missing data on their nativity status (n= 9,085), were non-US residents (n=2,558), were born in regions other than the US, the Caribbean, or SSA (n=31,696), or had non-singleton deliveries (n= 108,428) were excluded. Women who had missing or incomplete information on the following independent variables were also excluded: US region of residence (n=91,063), marital status (n=80,157), mother's education (n=16,400), parity (n=7,582), BMI (n=67,788), method of delivery (n=773), prenatal care adequacy (n=80,709), or previous cesarean (n=1,206). The total sample consisted of 2,059,282 live births.

Study Variables

Exposure Variable

The main exposure in this study was detailed maternal nativity, i.e., the mother's region and country of birth (Table 1 Appendix 3-A). The mother's detailed nativity was determined by the birth country variable available on the child's Birth Certificate Record. Black women who indicated being born in the Caribbean or sub-Saharan Africa were considered the exposed groups, and US-born Black women were considered unexposed. Individual countries with cell counts lower than 5,000 were collapsed into two composite variables called "All Other" for the Caribbean and SSA respectively. [41,48]

Outcome Variables

The outcome measures were gestational hypertension, eclampsia, and gestational diabetes. This information was recorded by the attendant at birth or other qualified hospital staff.[52]

Covariates

The potential confounders considered included maternal age (20-29, 30-39, 40-49), mother's education (some high school, high school graduate, some college, college degree, or unknown), marital status (married or not married), adequacy of prenatal care (adequate, intermediate, or inadequate), previous cesarean delivery, previous preterm delivery, insurance type, and location of residence (urban vs rural). Prenatal care adequacy was measured using the Adequacy of Prenatal Care Utilization Index.[54,55] The month prenatal care began and the number of prenatal care visits variables were used to create the following categories: Adequate = began care between 1-4 months, and had at least 15 prenatal visits at 40

weeks, Inadequate = began care at or after the 5th month, and had ≤6 prenatal visits, Intermediate = began care between 1-4 months and had ≤11 prenatal visits.[48] To further assess for the potential influence of location of residence on pregnancy complications, the mother's state and region of residence were also examined.

Statistical Analysis

US-born Black women were compared to Caribbean-born and SSA-born Black women. Comparisons were also made between Caribbean-born and SSA-born Black women and by maternal country of birth within the Caribbean and within SSA countries (e.g., Haiti vs All Other Caribbean, Nigeria vs All Other SSA).[48] To describe the sample, univariate analyses were conducted using frequencies for categorical variables (e.g., individual countries) and group differences were tested using Pearson Chi-square tests. Unadjusted odds ratios and 95% confidence intervals were calculated using logistic regression to obtain the crude association between detailed maternal nativity and the three outcomes (i.e., gestational hypertension, eclampsia, and gestational diabetes), and to identify other factors associated with the outcomes. Multivariate logistic regression was used to examine the association between detailed maternal nativity and gestational hypertension (Model 1), eclampsia (Model 2), and gestational diabetes (Model 3). A change in estimate approach was used to determine confounders whereby potential confounders that changed the crude odds ratio estimate by at least 10% were retained in the final models.[56] Model one was adjusted for age and insurance; Model 2 was adjusted for age, insurance, and US region of residence; and Model 3was adjusted for age, marital status, and insurance. All analyses were conducted in SAS software version 9.4.[57]

Ethics

The UNC Charlotte Institutional Review Board (IRB) deemed this study exempt from needing IRB approval as there was no human participation. Following the submission of a brief proposal of research objectives, and a data security plan, NCHS granted access to the datasets.

Results

Descriptive Statistics

Data indicated that 15% of the Black women who had a singleton delivery in the US between 2016-2020 were foreign-born, 10.25% of which were from SSA and 4.89% from the Caribbean (Table 3.2a Appendix 3-A). Over half of the sample were between the ages of 20-29 years (55.50%), highly educated (53.97%), and had their births covered by Medicaid (64.05%). Almost 6% of women in the sample population had gestational diabetes, 9% had gestational hypertension, and less than 1% had eclampsia.

Unadjusted Associations Between Detailed Maternal Nativity and Gestational Hypertension, Eclampsia, and Gestational Diabetes

There was evidence of a dose-response relationship between having age and having gestational hypertension, eclampsia, or gestational diabetes and age. Compared to 20-29-year-old women, those aged 30-39 had 13%; (95% CI: 1.12-1.14), 16%; (95% CI: 0.11-1.22), and 127%; (95% CI: 2.24-2.30) higher odds of gestational hypertension, eclampsia, and gestational diabetes, respectively (Table 3.3 Appendix 3-A). Women aged 40-49 had a 41%; (95% CI: 1.37-1.45), 69%; (95% CI: 1.51-1.88), and 246% (95% CI: 3.37-3.55) higher likelihood of these conditions respectively. All results were statistically significant. Foreign-born women had statistically significant lower odds of gestational hypertension (OR= 0.65; 95% CI: 0.64-0.66) and eclampsia (OR= 0.69; 95% CI: 0.63-0.74) and statistically significantly higher odds of gestational diabetes (OR= 1.55; 95% CI: 1.52-1.57) compared to US-born Black women. Only Ghanaian-born women had increased odds of having eclampsia compared to US-born Black women; however, this finding was not statistically significant (OR= 1.18; 95% CI: 0.94-1.48) (Table 3.3 Appendix 3-A).

Adjusted Associations Between Detailed Maternal Nativity and Gestational Hypertension, Eclampsia, and Gestational Diabetes

After adjusting for age and insurance status, all foreign-born Black women continued to have reduced odds of gestational hypertension but at attenuated magnitudes (ORs ranged from 0.41 to 0.78) when compared to US-born Black women and those findings were statistically significant (Table 3.4

Appendix 3-A). Similarly, after adjusting for age, insurance status and region of residence in the US, all foreign-born women had lower odds of eclampsia at attenuated magnitudes (ORs ranged from 0.25-0.37) and results were statistically significant except for DRC-born, and Ghanaian-born women. Lastly, after adjusting for age, marital status, and insurance status, all Caribbean-born women still had statistically significant increased odds of having gestational diabetes although the magnitudes of the associations were attenuated (ORs ranged from 1.05-1.24). However, among SSA-born women, reduced odds of gestational diabetes were observed among women born in two SSA countries compared to US-born women (Cameroon OR= 0.90; 95% CI: 0.83-0.98 and Nigeria OR= 0.84; 95% CI: 0.80-0.87).

Discussion

Summary

This study provides evidence for the differences in pregnancy complications including gestational hypertension, eclampsia and gestational diabetes observed among US-born, Caribbean-born and SSA-born Black women who had a delivery in the US between 2016-2020. Of the two million Black women in the sample, 15% were foreign-born, with SSA being the largest region of origin. Consistent with our hypotheses, foreign-born women had significantly lower odds of gestational hypertension and eclampsia, but higher odds of gestational diabetes compared to their US-born counterparts. After adjusting for age, marital status, and insurance status, among SSA-born women, only those from Cameroon and Nigeria had reduced odds of gestational diabetes. Additionally, after adjustment, Caribbean-born women maintained higher odds of gestational diabetes though at attenuated magnitudes and with increased odds ranging from 5% for Haitian-born women, 17% for Jamaican-born women to 24% among All Other Caribbean-born women when compared to US-born Black women. These findings were also consistent with previous studies of older Natality Data and Boston Birth Data that documented that foreign-born Black women are more likely to develop gestational diabetes.[9,58–60,,63]

After adjusting for age and insurance status, foreign-born Black women consistently exhibited reduced odds of gestational hypertension and eclampsia compared to US-born Black women, though these associations were attenuated. These findings are consistent with a previous study of pregnancy

complications among Black women in the 1998-2016 Boston Birth Cohort which reported that the odds of preeclampsia were 37% lower among foreign-born women who had resided in the US for less than 10 years,[61] a finding similar in magnitude to the present findings. In the adjusted gestational diabetes model, the hypothesis stating that the odds of pregnancy complications would differ across maternal birth countries within the Caribbean and separately within SSA was partially supported. Out of all foreign-born women only Cameroonian-born and Nigerian-born women had statistically significant reduced odds of gestational diabetes. There could be several reasons why no major differences in the odds of pregnancy complications were observed across each foreign sub-region of birth separately including potential homogeneity in life factors such as stress, acculturation, access to healthcare, cultural and behavioral factors [64] between the Caribbean-born and SSA-born Black women in the US.

Limitations & Strengths

There are several limitations worth noting. This secondary data analysis was limited by the information available on the birth certificate records. It is known that Natality data do not provide data on socioeconomic status, acculturation, English proficiency, knowledge of the pregnancy complications, health behaviors, and biomedical risk factors.[48] The inability to control for known or unknown confounders may have resulted in residual confounding and could have led to over or underestimates of the true associations. There is also a possibility that health selection (i.e., the degree to which potential immigrants migrate or not based on their health status) was higher among SSA-born women than Caribbean-born women. Although SSA-born immigrants are more likely to enter the US on diversity, student, or employment visas, they are also more likely to enter as refugees, compared to Caribbean-born immigrants. [49]

Nevertheless, this study also had some strength including the use of Natality U.S. Birth Certificate Data across all 50 states with information on detailed maternal nativity from 2016-2020. The nationally representative sample of this study addresses the small sample size limitations of previous studies and increases the generalizability of findings to US-born, SSA-born, and Caribbean-born Black mothers who had a live birth during the five-year period in this study. Additionally, the sample included

all live births to Black women with self-reported maternal nativity and pregnancy complication information from medical records; thus, non-differential misclassification of the exposure or outcome, and are unlikely.

Implications and Conclusions

The implications of this study are insightful for healthcare practice, particularly for prenatal care policy and research. Maternity care providers should be aware of differences in the prevalence of pregnancy complications among different subgroups of Black women based on their nativity. This can allow for enhanced quality of prenatal care, targeted counseling, and preventative measures for specific groups within the growing US Black Diaspora. For example, given the increased odds of gestational diabetes and reduced odds of eclampsia and gestational hypertension among foreign-born Black women, maternity care providers in states with high numbers of foreign-born Black women of reproductive age should consider initialing earlier diabetes screening and interventions to mitigate the impact of this pregnancy complication. Policy makers should support research aiming to examine the health disparities and maternity care needs of specific groups withing the Black Diaspora and consider programs that promote best practices from foreign-born Black communities that could benefit the overall Black US population.

This study also underscores the importance of collecting and analyzing data at more granular levels to understand the diverse experiences and mechanisms influencing pregnancy and birth outcomes for all Black women in the US. In conclusion, while this study sheds light on the disparities in pregnancy complications among US-born and Foreign-born Black women, addressing these disparities requires a multi-faceted approach, acknowledging the unique experiences of each subgroup, and ensuring that care is first accessible, then equitable and effective for all. Future research should seek to understand the roles of socio-economic, political, behavioral, and structural factors on the prevalence of pregnancy complications within the Black Diaspora. Future research should also consider subgroup analyses with specific maternal birth countries within West and East Africa to reveal potentially nuanced differences that are not apparent at a regional level. Additionally, conducting qualitative or mixed-methods designs

would provide insights into cultural, behavioral, and contextual factors that quantitative research alone might not capture.

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Appendix 3-A

Table 3.1. Frequencies of US-born, Caribbean-born, and Sub-Saharan African (SSA)-born Black Women, 2016-2020 NCHS Natality Data.

Year	**N**	**(%)**
2016	421,187	(20.45)
2017	411,331	(19.97)
2018	409,599	(19.89)
2019	411,585	(19.99)
2020	405,580	(19.70)
Total	2,059,282	(100)
Mother's Birth Country		
US	1,747,509	(84.68)
Caribbean		
Aruba	883	(0.04)
Antigua and Barbuda	451	(0.02)
Barbados	576	(0.03)
Bahamas	2,932	(0.14)
Cuba	80	(0.00)
Dominican Republic	1,077	(0.05)
Grenada	525	(0.03)
Haiti	**52,332**	**(2.54)**
Jamaica	**31,317**	**(1.52)**
ST Saint Lucia	710	(0.03)
Trinidad and Tobago	4,271	(0.21)
Sub-Saharan Africa		
Angola	883	(0.04)
Benin	863	(0.04)
Botswana	118	(0.01)
Burkina Faso	1,095	(0.05)
Burundi	1,480	(0.07)
Cameroon	**9,802**	**(0.480**
Cape Verde	3,426	(0.17)
Central African Republic	295	(0.01)
Chad	273	(0.01)
Comoros	14	(0.00)
Congo	3,376	(0.16)
Democratic Republic of Congo (DRC)	**11,133**	**(0.54)**
Djibouti	484	(0.02)
Eritrea	4,569	(0.22)
Ethiopia	**29,509**	**(1.43)**
Gabon	398	(0.02)
Gambia	1,818	(0.09)

Table 3.1. Frequencies of US-born, Caribbean-born, and Sub-Saharan African (SSA)-born Black Women, 2016-2020 NCHS Natality Data (Continued).

Ghana	**17,374**	**(0.84)**
Guinea-Bissau	63	(0.00)
Cote D'Ivoire	2,818	(0.14)
Kenya	**13,287**	**(0.65)**
Lesotho	27	(0.00)
Liberia	**10,099**	**(0.49)**
Madagascar	81	(0.00)
Malawi	329	(0.02)
Mali	1,182	(0.06)
Mauritius	16	(0.00)
Mozambique	85	(0.00)
Niger	538	(0.03)
Nigeria	**42,828**	**(2.08)**
Rwanda	1,485	(0.07)
Senegal	2,818	(0.14)
Seychelles	7	(0.00)
Sierra Leone	3,963	(0.19)
Somalia	**26,754**	**(1.30)**
South Africa	955	(0.05)
Sudan	**6,845**	**(0.33)**
Tanzania	1,862	(0.09)
Togo	3,092	(0.15)
Uganda	2,676	(0.13)
Zambia	819	(0.04)
Zimbabwe	1,220	(0.06)

Table 3.2a. Comparison of Demographic Characteristics of US-born, Caribbean-born, and Sub-Saharan-born (SSA) Black Women, 2016-2020 NCHS Natality Data.

	US-born	**Foreign-born**	***p* value[a]**	**Caribbean**	**SSA**	***p* value[b]**
	N= 1,743,871 (84.68)	N= 315,411 (15.32)		N= 100,762 (4.89)	N= 211,011 (10.25)	
Variables						
Gestational Hypertension			<.0001			<.0001
Yes	155,218 (7.54)	18,3930 (0.92)		6,828 (0.33)	11,795 (0.57)	
No	1,588,653 (77.15)	296,472 (14.40)		93,934 (4.56)	199,216 (9.67)	
Eclampsia			<.0001			<.0001
Yes	6,453 (0.31)	800 (0.04)		294 (0.01)	498 (0.02)	
No	84.37	15.28		100,468 (4.88)	210,522 (10.22)	
Gestational Diabetes			<.0001			<.0001
Yes	90,951 (4.42)	24,711 (1.20)		7,478 (0.36)	17,020 (0.83)	
No	1,652,920 (80.27)	290,700 (14.12)		93,284 (4.53)	193,991 (9.42)	
Maternal Age			<.0001			<.0001
20-29	1,142,851 (55.50)	110,118 (5.35)		35,772 (1.74)	72,433 (3.52)	
30-39	560,319 (27.21)	182,109 (8.84)		56,121 (2.73)	124,458 (6.04)	
40-49	40,701 (1.98)	23,184 (1.13)		8,869 (0.43)	14,120 (0.69)	
Marital Status			<.0001			<.0001
Married	430,495 (20.91)	221,117 (10.74)		62,010 (3.01)	157,801 (7.66)	
Not Married	1,313,376 (63.78)	94,294 (4.58)		38,752 (1.88)	53,210 (2.58)	

Table 3.2a. Comparison of Demographic Characteristics of US-born, Caribbean-born, and Sub-Saharan-born (SSA) Black Women, 2016-2020 NCHS Natality Data (Continued).

Mother's Education			<.0001			<.0001
Less Than High School	171,937 (8.35)	44,230 (2.15)		10,206 (0.50)	33,887 (1.65)	
High School or GED	649,640 (31.55)	82,190 (3.99)		31,758 (1.54)	49,378 (2.40)	
Some College or College Degree	825,274 (40.08)	155,732 (7.56)		50,525 (2.45)	103,094 (5.01)	
Graduate Degree	97,020 (4.71)	33,259 (1.62)		8,273 (0.40)	24,652 (1.20)	
Parity			<.0001			<.0001
1	561,131 (27.25)	96,011 (4.86)		35,645 (1.73)	63,020 (3.06)	
2	518,171 (25.16)	96,011 (4.66)		32,902 (1.60)	62,025 (3.01)	
≥3	664,569 (32.27)	119,413 (5.80)		32,215 (1.56)	85,966 (4.17)	
Gestational Weight Gain			<.0001			<.0001
Met	466,408 (22.65)	97,599 (4.74)		30,315 (1.47)	66,244 (3.22)	
Below	419,768 (20.38)	92,364 (4.49)		27,457 (1.33)	64,068 (3.11)	
Exceeded	857,695 (41.65)	125,448 (6.09)		42,990 (2.09)	80,699 (3.92)	
Prenatal Care Adequacy			<.0001			<.0001
Adequate	1,175,189 (57.07)	192,784 (9.36)		64,563 (3.14)	125,772 (6.11)	
Intermediate	198,234 (9.63)	37,094 (1.80)		12,440 (0.60)	24,199 (1.18)	
Inadequate	370,448 (17.99)	85,533 (4.15)		23,759 (1.15)	61,040 (2.96)	
Insurance Type			<.0001			<.0001
Medicaid	1,157,751 (56.22)	161,291 (7.83)		49,431 (2.40)	1,09936 (5.34)	
Private	498,529 (24.21)	109,443 (5.31)		36,744 (1.78)	7,1308 (3.46)	
Self-Pay	25,244	31,452		10,117	2,1258	

	(1.23)	(1.53)		(0.49)	(1.03)	

Table 3.2a. Comparison of Demographic Characteristics of US-born, Caribbean-born, and Sub-Saharan-born (SSA) Black Women, 2016-2020 NCHS Natality Data (Continued).

Other	62,347	13,225		4,470	8,509	
	(3.03)	(0.64)		(0.22)	(0.41)	
Region of Residence			<.0001			<.0001
Northeast	183,336	69,421		32,959	36,093	
	(8.90)	(3.37)		(1.60)	(1.75)	
Midwest	367,816	66,177		3,854	62,168	
	(17.86)	(3.21)		(0.19)	(3.02)	
South	1,123,851	155,325		62,053	90,291	
	(54.57)	(7.54)		(3.01)	(4.38)	
West	68,868	24,488		1,896	22,459	
	(3.34)	(1.19)		(0.09)	(1.09)	
Location of Residence			<.0001			<.0001
Urban	1,734,107	315,215		100699	210880	
	(84.21)	(15.31)		(4.89)	(10.24)	
Rural	9,764	196		63	131	
	(0.47)	(0.01)		(0.00)	(0.01)	
Pre-Pregnancy Hypertension			<.0001			<.0001
Yes	82,485	7,557		3,142	4,273	
	(4.01)	(0.37)		(0.15)	(0.21)	
No	1,661,386	307,854		97,620	2,06738	
	(80.68)	(14.95)		(4.74)	(10.04)	
Pre-Pregnancy Diabetes			<.0001			<.0001
Yes	24,514	3,597		1,494	2,049	
	(1.19)	(0.17)		(0.07)	(0.10)	
No	1,719,357	311,814		99,268	208,962	
	(83.49)	(15.14)		(4.82)	(10.15)	
Previous Preterm Birth			<.0001			<.0001
Yes	100,998	9,989		2,761	7,090	
	(4.90)	(0.49)		(0.13)	(0.34)	
No	1,642,873	305,422		98,001	203,921	
	(79.78)	(14.83)		(4.76)	(9.90)	

Table 3.2a. Comparison of Demographic Characteristics of US-born, Caribbean-born, and Sub-Saharan-born (SSA) Black Women, 2016-2020 NCHS Natality Data (Continued).

Previous Cesarean			<.0001		<.0001
Yes	318,828 (15.48)	63,149 (3.07)		18,050 (0.88)	44,477 (2.16)
No	1,425,043 (69.20)	252,262 (12.25)		82,712 (4.02)	166,534 (8.09)

[a] *p* values refer to a Pearson Chi-square test for the differences between US-born and Foreign-born Black women.

[b] *p* values refer to a Pearson Chi-square test for the differences between Caribbean-born and SSA-born Black women.

Table 3.2b. Comparison of Demographic Characteristics of Caribbean-born Black women by country of birth, 2016-2020 NCHS Natality Data.

	Haiti	**Jamaica**	**All Other Caribbean**	***p* value[a]**
	(N=52,332)	(N=313,17)	(N= 17,113)	
	2.54%	1.52%	0.83%	
Variables				
Gestational Hypertension				<.0001
Yes	3264	2290	1274	
	(0.16	(0.11)	(0.06)	
No	49068	29027	15839	
	(2.38)	(1.41)	(0.77)	
Eclampsia				<.0001
Yes	141	106	47	
	(0.01)	(0.01)	(0.00	
No	52191	31211	17066	
	(2.53)	(1.52)	(0.83)	
Gestational Diabetes	(3,712)	(2,376)	(1,390)	<.0001
Yes	3712	2376	1390	
	(0.18)	(0.12)	(0.07)	
No	48620	28941	15723	
	(2.36)	(1.41)	(0.76)	
Maternal Age				<.0001
20-29	18037	11849	5886	
	(0.88)	(0.58)	(0.29)	
30-39	29441	16791	9889	
	(1.43)	(2.26)	(0.48)	
40-49	4854	2677	1338	
	(0.24)	(0.13)	(0.06)	
Marital Status				<.0001
Married	34661	17162	10187	
	(1.68)	(0.83)	(0.49)	
Not Married	17671	14155	6926	
	(0.86)	(0.69)	(0.34)	
Mother's Education				<.0001
Less Than High School	7832	1384	990	
	(0.38)	(0.07)	(0.05)	
High School or GED	18485	8702	4571	
	(0.90)	(0.42)	(0.22)	
Some College or College Degree	23764	17721	9040	
	(1.15)	(0.86)	(0.44)	
Graduate Degree	2251	3510	2512	
	(0.11)	(0.17)	(0.12)	

Table 3.2b. Comparison of Demographic Characteristics of Caribbean-born Black women by country of birth, 2016-2020 NCHS Natality Data. (Continued)

Parity				<.0001
1	17295	11945	6405	
	(0.84)	(0.58)	(0.31)	
2	16834	10326	5742	
	(0.82)	(0.50)	(0.28)	
≥3	18203	9046	4966	
	(0.88)	(0.44)	(0.24)	
Gestational Weight Gain				<.0001
Met	15853	9255	5207	
	(0.77)	(0.45)	(0.25)	
Below	16338	6949	4170	
	(0.79)	(0.34)	(0.20)	
Exceeded	20141	15113	7736	
	(0.98)	(0.73)	(0.38)	
Prenatal Care Adequacy				<.0001
Adequate (1st-4th months, ≥15 visits)	32336 (1.57)	21050 (1.02)	11177 (0.54)	
Intermediate (1st-4th months, ≥11 visits)	6723 (0.33)	3634 (0.18)	2083 (0.10)	
Inadequate (5th month, ≤6 visits)	13273 (0.64)	6633 (0.32)	3853 (0.19)	
Insurance Type				<.0001
Medicaid	30255	12869	6307	
	(1.47)	(0.62)	(0.31)	
Private	14792	13936	8016	
	(0.72)	(0.68)	(0.39)	
Self-Pay	5442	2823	1852	
	(0.26)	(0.14)	(0.09)	
Other	1843	1689	938	
	(0.09)	(0.08)	(0.05)	
Region of Residence				<.0001
Northeast	15984	11713	5262	
	(0.78)	(0.57)	(0.26)	
Midwest	1571	1419	864	
	(0.08)	(0.07)	(0.04)	
South	34224	17488	10341	
	(1.66)	(0.85)	(0.50)	
West	553	697	646	
	(0.03)	(0.03)	(0.03)	
Location of Residence				<.0001
Urban	52321	31300	17078	
	(2.54)	(1.52)	(0.83)	

Rural	11	17	35	
	(0.00)	(0.00)	(0.00)	

Table 3.2b. Comparison of Demographic Characteristics of Caribbean-born Black women by country of birth, 2016-2020 NCHS Natality Data. (Continued)

Pre-Pregnancy Hypertension				<.0001
Yes	1359	1178	605	
	(0.07)	(0.06)	(0.03)	
No	50973	30139	16508	
	(2.48)	(1.46)	(0.80)	
Pre-Pregnancy Diabetes				<.0001
Yes	764	464	266	
	(0.04)	(0.02)	(0.01)	
No	51568	30853	16847	
	(2.50)	(1.50)	(0.82)	
Previous Preterm Birth				<.0001
Yes	1177	1028	556	
	(0.06)	(0.05)	(0.03)	
No	51155	30289	16557	
	(2.48)	(1.47)	(0.80)	
Previous Cesarean				<.0001
Yes	10221	4812	3017	
	(0.50)	(0.23)	(0.15)	
No	42111	26505	14096	
	(2.04)	(1.29)	(0.68)	

[a] *p* values refer to a Pearson Chi-square test for the differences by maternal country of birth among Caribbean-born women.

Table 3.2c. Comparison of Demographic Characteristics of Sub-Saharan African (SSA)-born Black women by country of birth, 2016-2020 NCHS Natality Data.

Variables	**Cameroon** (N=9,802) 0.48 %	**DRC** (N=11,133) 0.54 %	**Ethiopia** (N=29,509) 1.43 %	**Kenya** (N=13,287) 0.65 %	**Liberia** (N=10,099) 0.49 %	**Ghana** (N=17,374) 1.43 %	**Nigeria** (N=42,828) 2.08 %	**Sudan** (N=6,845) 0.33 %	**Somalia** (N=26,754) 1.30 %	**All Other SSA** (N=43,380) 2.11 %	***p* value**[a]
Gestational Hypertension											<.0001
Yes	547 (0.03)	798 (0.04)	1220 (0.06)	649 (0.03)	661 (0.03)	1284 (0.06)	2683 (0.13)	329 (0.02)	1295 (0.06)	2329 (0.11)	
No	9255 (0.45)	10335 (0.50)	28289 (1.37)	12638 (0.61)	9438 (0.46)	16090 (0.78)	40145 (1.95)	6516 (0.32)	25459 (1.24)	15839 (1.99)	
Eclampsia											<.0001
Yes	16 (0.00)	35 (0.00	69 (0.00)	32 (0.00)	25 (0.00)	76 (0.00)	78 (0.00)	11 (0.00)	49 (0.00)	98 (0.00)	
No	9786 (0.48)	11098 (0.54)	29440 (1.43)	13255 (0.64)	10074 (0.490)	17298 (0.84)	42750 (2.08)	6834 (0.33)	26705 (1.30)	43282 (2.10)	
Gestational Diabetes											<.0001
Yes	594 (0.03)	771 (0.04)	2861 (0.14)	825 (0.04)	784 (0.04)	1781 (0.09)	2455 (0.12)	706 (0.03)	2745 (0.13)	3498 (0.17)	
No	9208 (0.45)	10362 (0.50)	26648 (1.29)	12462 (0.61)	9315 (0.48)	15593 (0.76)	40373 (1.96)	6139 (0.30)	24009 (1.17)	39882 (1.94)	
Maternal Age											
20-29	3649 (0.18)	5437 (0.26)	9050 (0.44)	5685 (0.28)	4290 (0.21)	4559 (0.22)	10479 (0.51)	2395 (0.12)	9863 (0.48)	17026 (0.83)	<.0001
30-39	5607 (0.27)	5137 (0.25)	18363 (0.89)	6571 (0.32)	5326 (0.26)	11503 (0.56)	29334 (1.42)	3903 (0.19)	15395 (0.75)	23319 (3.14)	
40-49	546 (0.03)	559 (0.03)	2096 (0.10)	1031 (0.05)	483 (0.02)	1312 (0.06)	3015 (0.15)	547 (0.03)	1496 (0.07)	3035 (0.15)	
Marital Status											<.0001

Table 3.2c. Comparison of Demographic Characteristics of Sub-Saharan African (SSA)-born Black women by country of birth, 2016-2020 NCHS Natality Data (Continued).

Married	7256 (0.35)	8432 (0.41)	20853 (1.01)	9411 (0.46)	5326 (0.26)	12964 (0.63)	37083 (1.80)	5612 (0.27)	20411 (0.99)	30453 (1.48)	
Not Married	2546 (0.12)	2701 (0.13)	8656 (0.42)	3876 (0.19)	4773 (0.23)	4410 (0.21)	5745 (0.28)	1233 (0.06)	6343 (0.31)	12927 (0.63)	
Mother's Education											<.0001
Less Than High School	296 (0.01)	3041 (0.15)	4886 (0.24)	1007 (0.05)	1092 (0.05)	487 (0.02)	910 (0.04)	1354 (0.07)	13100 (0.64)	7714 (0.37)	
High School or GED	1506 (0.07)	4070 (0.20)	9196 (0.45)	2596 (0.13)	3608 (0.18)	3436 (0.17)	4727 (0.23)	1761 (0.09)	7168 (0.35)	11310 (0.22)	
Some College or College Degree	6148 (0.30)	3723 (0.18)	13745 (0.51)	8030 (0.39)	4902 (0.24)	10467 (0.51)	26629 (1.29)	3254 (0.16)	6149 (0.30)	20047 (0.97)	
Graduate Degree	1852 (0.09)	299 (0.01)	1682 (0.08)	1654 (0.08)	497 (0.02)	2984 (0.14)	10562 (0.51)	476 (0.02)	337 (0.02)	4309 (0.12)	
Parity											<.0001
1	3416 (0.17)	3069 (0.15)	9566 (0.46)	4738 (0.23)	2543 (0.12)	5705 (0.28)	14502 (0.70)	1451 (0.07)	3830 (0.19)	14200 (0.69)	
2	3152 (0.15)	2708 (0.13)	10042 (0.49)	4481 (0.22)	2961 (0.14)	5781 (0.28)	13819 (0.67)	1541 (0.07)	4194 (0.20)	13346 (0.65)	
≥3	3234 (0.16)	5356 (0.26)	9901 (0.48)	4068 (0.20)	4595 (0.22)	5888 (0.29)	14507 (0.70)	3853 (0.19)	18730 (0.91)	15834 (0.24)	
Gestational Weight Gain											<.0001
Met	2790 (0.14)	3430 (0.17)	10250 (0.50)	4360 (0.21)	2919 (0.14)	5422 (0.26)	13602 (0.66)	2064 (0.10)	8008 (0.39)	13399 (0.65)	
Below	1843 (0.09)	3818 (0.19)	8807 (0.43)	4215 (0.20)	2612 (0.13)	4393 (0.21)	10705 (0.52)	2647 (0.13)	11620 (0.56)	13408 (0.65)	
Excee	5169	3885	10452	4712	4568	7559	18521	2134	7126	16573	

ded	(0.25)	(0.19)	(0.51)	(0.23)	(0.22)	(0.98)	(0.90)	(0.10)	(0.35)	(0.80)	

Table 3.2c. Comparison of Demographic Characteristics of Sub-Saharan African (SSA)-born Black women by country of birth, 2016-2020 NCHS Natality Data (Continued).

Prenatal Care Adequacy											<.0001
Adequate	6339	6225	18162	8335	6671	12031	22153	4131	15158	26567	
	(0.31)	(0.30)	(0.88)	(0.40)	(0.32)	(0.58)	(1.08)	(0.20)	(0.74)	(1.29)	
Intermediate	1010	1035	3663	1665	1263	1803	3779	823	4572	4586	
	(0.05)	(0.05	(0.18)	(0.08)	(0.06)	(0.09)	(0.18)	(0.04)	(0.22)	(0.22)	
Inadequate	2453	3873	7684	3287	2165	3540	16896	1891	7024	12227	
	(0.12)	(0.19)	(0.37)	(0.16)	(0.11)	(0.17)	(0.82)	(0.09)	(0.34)	(0.59)	
Insurance Type											<.0001
Medicaid	4702	7468	16767	5917	5483	6831	13778	4170	22002	22818	
	(0.23)	(0.36)	(0.81)	(0.29)	(0.27)	(0.33)	(0.67)	(0.20)	(1.07)	(1.11)	
Private	4018	2461	10781	6068	3743	8440	14405	2105	3874	15413	
	(0.20)	(0.12)	(0.52)	(0.29)	(0.18)	(0.41)	(0.70)	(0.10)	(0.19)	(0.75)	
Self-Pay	554	938	996	718	441	1160	12593	372	438	3048	
	(0.03)	(0.05)	(0.05)	(0.03)	(0.02)	(0.06)	(0.61)	(0.02)	(0.02)	(0.15)	
Other	528	266	965	584	432	943	2052	198	440	2101	
	(0.03)	(0.01)	(0.05)	(0.03)	(0.02)	(0.05)	(0.10)	(0.01)	(0.02)	(0.10)	
Region of Residence											<.0001
Northeast	1176	1529	2876	2239	2760	5408	6135	954	2059	10957	
	(0.06)	(0.07)	(0.14)	(0.11)	(0.13)	(0.26)	(0.30)	(0.05)	(0.10)	(0.53)	
Midwest	1678	3422	7844	4271	3996	3397	6743	2345	18278	10194	
	(0.08)	(0.17)	(0.38)	(0.21)	(0.19)	(0.16)	(0.33)	(0.11)	(0.89)	(0.50)	
South	6448	4420	12865	4918	2746	7619	28077	2567	2757	17874	
	(0.31)	(0.21)	(0.62)	(0.24)	(0.13)	(0.37)	(1.36)	(0.12)	(0.13)	(0.87)	
West	500	1762	5924	1859	597	950	1873	979	3660	4355	
	(0.02)	(0.09)	(0.29)	(0.09)	(0.03)	(0.05)	(0.09)	(0.05)	(0.18)	(0.21)	
Location of Residence											<.0001
Urban	9801	11104	29499	13273	10090	17362	42812	6843	26751	43345	
	(0.48)	(0.54)	(1.43)	(0.64)	(0.49)	(0.84)	(2.08)	(0.33)	(1.30)	(2.10)	
Rural	1	29	10	14	9	12	16	2	3	35	
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	
Pre-Pregnancy Hype											

rtension											
Yes	193	297	201	189	261	637	1166	117	310	902	
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.03)	(0.06)	(0.01)	(0.02)	(0.04)	
No	9609	10836	29308	13098	9838	16737	41662	6728	26444	42478	
	(0.47)	(0.53)	(1.42)	(0.64)	(0.48)	(0.81)	(2.02)	(0.33)	(1.28)	(2.06)	
Pre-Pregnancy Diabetes											
Yes	53	114	236	84	100	211	343	110	389	409	
	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.02)	(0.01)	(0.02)	(0.02)	
No	9749	11019	29273	13203	9999	17163	42485	6735	26365	42971	
	(0.47)	(0.54)	(1.42)	(0.64)	(0.49)	(0.01)	(0.02)	(0.01)	(0.02)	(0.02)	
Previous Preterm Birth											
Yes	256	384	642	408	386	681	1126	304	1564	1339	
	(0.01)	(0.02)	(0.03)	(0.02)	(0.02)	(0.03)	(0.05)	(0.01)	(0.08)	(0.07)	
No	9546	10749	28867	12879	9713	16693	41702	6541	25190	42041	
	(0.46)	(0.52)	(1.40)	(0.63)	(0.47)	(0.81)	(2.03)	(0.32)	(1.22)	(2.04)	
Previous Cesarean											<.0001
Yes	1904	1881	6912	2559	2072	4169	9165	1578	6159	8078	
	(0.09)	(0.09)	(0.34)	(0.12)	(0.10)	(0.20)	(0.45)	(0.08)	(0.30)	(0.39)	
No	7898	9252	22597	10728	8027	13205	33663	5267	20595	35302	
	(0.38)	(0.45)	(1.10)	(0.52)	(0.39)	(0.64)	(1.63)	(0.26)	(1.00)	(1.71)	

[a] *p* values refer to a Pearson Chi-square test for the differences by maternal country of birth among SSA-born women.

Table 3.3: Unadjusted Odds Ratios and 95% Confidence Intervals for the associations between detailed maternal nativity and gestational hypertension, eclampsia, and gestational diabetes.

	Gestational Hypertension (Ref. No) Yes	Eclampsia (Ref. No) Yes	Gestational Diabetes (Ref. No) Yes
Variables	**OR (95% CI)**	**OR (95% CI)**	**OR (95% CI)**
Mothers' Nativity			
Born in US	1.00 (Referent)	1.00 (Referent)	1.00 (Referent)
Born Outside US	0.65 (0.64-0.66)	0.69 (0.63-0.74)	1.55 (1.52-1.57)
Mother's Birth Country			
US	1.00 (Referent)	1.00 (Referent)	1.00 (Referent)
		Caribbean	
Haiti	0.68 (0.66-0.71)	0.73 (0.62-0.86)	1.39 (1.34-1.44)
Jamaica	0.81 (0.77-0.84)	0.91 (0.75-1.11)	1.49 (1.43-1.56)
All Other Caribbean	0.82 (0.78-0.87)	0.74 (0.56-0.99)	1.61 (1.52-1.70)
		Sub-Saharan Africa	
Cameroon	0.61 (0.56-0.66)	0.44 (0.27-0.72)	1.17 (1.08-1.27)
DRC	0.79 (0.74-0.85)	0.85 (0.61-1.18)	1.35 (1.26-1.46)
Ethiopia	0.44 (0.42-0.47)	0.63 (050-0.80)	1.95 (1.88-2.03)
Ghana	0.82 (0.77-0.87)	1.18 (0.94-1.48)	2.08 (1.98-2.18)
Kenya	0.53 (0.49-0.57)	0.65 (0.46-0.92)	1.20 (1.12-1.29)
Liberia	0.72 (0.66-0.71)	0.67 (0.45-0.99)	1.53 (1.42-1.65)
Nigeria	0.68 (0.66-0.71)	0.49 (0.39-0.61)	1.11 (1.06-1.15)
Somalia	0.52 (0.50-0.55)	0.49 (0.37-0.65)	2.08 (2.00-2.16)
Sudan	0.52 (0.46-0.58)	0.43 (0.24-0.78)	2.09 (1.93-2.26)
All Other SSA	0.58 (0.56-0.61)	0.61 (0.50-074)	1.59 (1.54-1.65)
Maternal Age			
20-29	1.00 (Referent)	1.00 (Referent)	1.00 (Referent)
30-39	1.13 (1.12-1.14)	1.16 (0.11-1.22)	2.27 (2.24-2.30)
40-49	1.41 (1.37-1.45)	1.69 (1.51-1.88)	3.46 (3.37-3.55)
Marital Status			
Married	0.87 (0.86-0.88)	0.91 (0.87-0.96)	1.54 (1.52-1.56)
Not Married	1.00 (Referent)	1.00 (Referent)	1.00 (Referent)
Mother's Education			
Less Than High School	0.87 (0.86-0.89)	0.98 (0.91-1.06)	0.85 (0.84-0.87)

Table 3.3: Unadjusted Odds Ratios and 95% Confidence Intervals for the associations between detailed maternal nativity and gestational hypertension, eclampsia, and gestational diabetes (Continued).

High School or GED	0.99 (0.98-1.00)	1.03 (0.98-1.090	0.81 (0.80-0.82)
Some College or College Degree	1.00 (Referent)	1.00 (Referent)	1.00 (Referent)
Graduate Degree	0.98 (0.96-1.00)	1.03 (0.98-1.09)	1.10 (1.07-1.12)
Parity			
1	1.55 (1.54-1.57)	1.38 (1.31-1.46)	0.78 (0.77-0.80)
2	0.97 (0.96-0.98)	0.94 (0.88-1.00)	
≥3	1.00 (Referent)	1.00 (Referent)	1.00 (Referent)
Gestational Weight Gain			
Met	0.69 (0.68-0.70)	0.75 (0.71-0.79)	0.93 (0.92-0.94)
Below	0.64 (0.63-0.65)	0.77 (0.72-0.81)	0.90 (0.89-0.91)
Exceeded	1.00 (Referent)	1.00 (Referent)	1.00 (Referent)
Prenatal Care Adequacy			
Adequate	1.00 (Referent)	1.00 (Referent)	1.00 (Referent)
Intermediate	0.75 (0.74-0.77)	0.72 (0.66-0.78)	0.65 (0.64-0.67)
Inadequate	0.84 (0.83-0.85)	0.90 (0.85-0.95)	0.69 (0.68-0.70)
Insurance Type			
Medicaid	1.00 (Referent)	1.00 (Referent)	1.00 (Referent)
Private	1.05 (1.03-1.06)	1.02 (0.97-1.07)	1.25 (1.23-1.26)
Self-Pay	0.72 (0.70-0.75)	0.83 (0.71-0.97)	0.78 (0.75-0.82)
Other	0.94 (0.91-0.96)	1.37 (0.23-1.52)	0.02 (0.98-1.05)
Region of Residence			
Northeast	1.02 (1.01-1.04)	1.83 (1.72-1.94)	1.26 (1.24-1.28)
Midwest	1.11 (1.10-1.12)	0.87 (082-0.93)	1.22 (1.20-1.24)
West	0.90 (0.88-0.93)	1.53 (1.39-1.69)	1.24 (1.21-1.28)
South	1.00 (Referent)	1.00 (Referent)	1.00 (Referent)
Location of Residence			
Urban	1.00 (Referent)	1.00 (Referent)	1.00 (Referent)
Rural	0.99 (0.92-1.06)	1.26 (0.93-1.69)	0.77 (0.70-0.85)
Previous Preterm Birth			
Yes	1.44 (1.41-1.47)	1.54 (1.42-1.68)	1.41 (1.37-1.44)
No	1.00 (Referent)	1.00 (Referent)	1.00 (Referent)

Table 3.3: Unadjusted Odds Ratios and 95% Confidence Intervals for the associations between detailed maternal nativity and gestational hypertension, eclampsia, and gestational diabetes (Continued).

Previous Cesarean			
Yes	0.99 (0.97-1.00)	1.13 (1.07-1.20)	1.47 (1.45-1.49)
No	1.00 (Referent)	1.00 (Referent)	1.00 (Referent)
Pre-Pregnancy Hypertension	-		
Yes	-	2.24 (2.07-2.43)	2.48 (2.43-2.53)
No	-	1.00 (Referent)	1.00 (Referent)
Pre-Pregnancy Diabetes			-
Yes	2.15 (2.08-2.22)	2.86 (2.53-3.22)	-
No	1.00 (Referent)	1.00 (Referent)	-

Gestational Hypertension includes pre-pregnancy hypertension in Natality data.
Gestational Diabetes includes pre-pregnancy diabetes in Natality data.
p-value <0.05

Table 3.4: Adjusted Odds Ratios and 95% Confidence Intervals for the associations between detailed maternal nativity and gestational hypertension, eclampsia, and gestational diabetes among Black women, NCHS Natality Data 2016-2020.

	Model 1	**Model 2**	**Model 3**
	Gestational Hypertension (Ref. No) Yes	**Eclampsia (Ref. No) Yes**	**Gestational Diabetes (Ref. No) Yes**
Variables	**OR (95% CI)**	**OR (95% CI)**	**OR (95% CI)**
Mother's Birth Country			
US	1.00 (Referent)	1.00 (Referent)	1.00 (Referent)
	Caribbean		
Haiti	0.64 (0.0.62-0.66)	0.56 (0.48-0.67)	1.05 (1.01-1.09)
Jamaica	0.76 (0.73-0.80)	0.69 (0.56-0.83)	1.17 (1.12-1.22)
All Other Caribbean	0.78 (0.73-0.82)	0.58 (0.43-0.77)	1.24 (1.17-1.31)
	Sub-Saharan Africa		
Cameroon	0.57 (0.52-0.62)	0.40 (0.25-0.65)	0.90 (0.83-0.98)
DRC	0.77 (0.72-0.83)	0.75 (0.54-1.04)	1.13 (1.05-1.22)
Ethiopia	0.41 (0.39-0.43)	0.54 (0.42-0.68)	1.42 (1.36-1.47)
Ghana	0.75 (0.71-0.80)	0.91 (0.72-1.14)	1.48 (1.41-1.55)
Kenya	0.50 (0.46-0.54)	0.55 (0.39-0.79)	0.95 (0.88-1.02)
Liberia	0.68 (0.63-0.74)	0.56 (0.38-0.83)	1.24 (1.16-1.34)
Nigeria	0.66 (0.63-0.69)	0.43 (0.34-0.53)	0.84 (0.80-0.87)
Somalia	0.49 (0.46-0.52)	0.46 (0.35-0.62)	1.55 (1.49-1.62)
Sudan	0.48 (0.43-0.54)	0.37 (0.21-0.67)	1.54 (1.42-1.67)
All Other SSA	0.55 (0.53-0.57)	0.49 (0.40-0.60)	1.24 (1.20-1.29)

Model 1: Gestational Hypertension was adjusted for age, and insurance.
Model 2: Eclampsia was adjusted for age, insurance, and US region of residence.
Model 3: Gestational Diabetes was adjusted for age, marital status, and insurance.
p-value <0.05

CHAPTER 5: CONCLUSION

Summary of Findings

This dissertation investigated the associations between detailed maternal nativity (DMN) (i.e., a mother's nativity status and specific country of birth) and differences in labor and delivery (L&D) experiences among Black women in the US. Through three distinct yet interrelated studies, the author explored the factors influencing access and utilization of L&D care as well as select L&D characteristics, and pregnancy complications, drawing insights from both US-born and foreign-born Black women who gave birth in the US.

The first study was a scoping review of the current literature providing a comprehensive overview of the factors that affected Black women's access, utilization, and lived experiences of L&D in the US. The findings highlighted the complex interplay of systemic determinants and economic and socio-cultural factors in shaping Black women's L&D choices, experiences, and birth outcomes. Notably, the study identified a critical need for more in-depth research on the L&D experiences of foreign-born Black women who give birth in the US.

The second and third studies were secondary analyses of Natality data for all live births to US-born, Caribbean-born and SSA-born Black women who had a live delivery, in the US, between 2016-2020. The second study explored the associations between DMN and three basic L&D characteristics (i.e., the attendant at birth, the place and method of delivery). The findings were mixed with some consistent patterns among Caribbean-born women who had increased odds of being attended by a CNM, decreased odds of delivering in either freestanding birthing centers or at home, and consequently having higher odds of delivering via cesarean than their US-born counterparts. However, among SSA-born women, more variations in the associations were observed with women born in Cameroon, Ghana, and Nigeria women having decreased odds of having a CNM at delivery whereas those born in Kenya, Liberia, and Somalia had increased odds of being attended by a CNM. Similarly, the author observed differing associations between DMN and the method of delivery where Congolese, Somalian, Sudanese, and All Other SSA-born women had statistically significantly decreased odds of delivering via cesarean

while Cameroonian, Ethiopian, Ghanaian and Kenyan-born women had slightly increased odds of cesarean delivery compared to US-born women.

Lastly, the third study examined the associations between DMN and the three most prevalent pregnancy complications among US Black women: gestational hypertension, eclampsia, and gestational diabetes.[1] Consistent with previous literature, [2–5,6,7] the results revealed that foreign-born women had significantly lower odds of gestational hypertension and eclampsia, but higher odds of gestational diabetes compared to their US-born counterparts. There were no major differences observed the in the odds of pregnancy complications across Caribbean-born and SSA-born women. Overall, these findings highlighted the need for tailored healthcare interventions to address the unique needs of foreign-born Black women.

Shared Implications

The findings of this dissertation research underscored the importance of considering DMN more closely in healthcare planning and delivery. The complex nuances in L&D experiences among Black women are not merely academic/scientific observations but have real-world implications for healthcare provision. Maternity care providers, and health legislators need to be cognizant of these differences to tailor their efforts to eradicate the Black maternal mortality crisis accordingly. Understanding the role of systemic and individual factors that influence L&D experiences can lead to more inclusive policymaking and patient-centered maternity care. Specifically, for foreign-born Black women in the US, there is a need for more granular data collection and analysis approaches that consider their unique ethnocultural backgrounds.

Limitations of the Dissertation

The three studies presented come with some limitations. The systematic scoping review was restricted to English literature and studies based in the US, possibly missing pertinent research in other languages or countries (e.g., Canada). The specific inclusion criteria may have inadvertently sidelined some relevant studies that were conducted in the US. Notably, despite the aim to encompass all Black women's L&D experiences in the US, there is a glaring scarcity in literature pertaining to foreign-born

Black women's L&D experiences, with a mere three out of 27 included papers focusing on them, and two solely on Somali-born women. Additionally, the scoping review design does not include a quality assessment of articles.

The second and third studies both highlight the known limitations of birth certificate data, notably, the inability to control for several factors associated with maternity care, including immigration status, migrant health selection, acculturation, length of US residence, socioeconomic status, English proficiency, health literacy, and health behaviors,[8–17] since this information is not collected on birth certificates. Additionally, the possible underreporting of the number of midwife-attended births, especially in deliveries involving multiple providers or hospital policies requiring physicians to be listed as the primary attendants may have biased results.

Strengths of the Dissertation

This dissertation project also boasts of several strengths that amplify the included studies' contributions to maternal and reproductive health services research. First, all three studies were guided by the Andersen Behavioral Model of Health Services Use, allowing for an overall comprehensive (data permitting) look into the contextual and individual factors influencing the outcomes of interest.[18,19] Second, the systematic scoping review adhered to well established protocols including the (JBI) guidelines[20] for conducting scoping reviews and was reported using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR)[21] and followed the Arksey and O'Malley's (2005) scoping review framework ensuring methodological rigor and transparency.[22] The collaborative nature of this review included consultation with a specialized librarian and dual review with a second reviewer. The inclusion of a wide range of study types including quantitative, qualitative and mixed-methods literature provided a multifaceted perspective on the L&D experiences of US Black mothers.

The second and third studies distinguish themselves by employing a granular approach to nativity status and addressing a gap in research--the role of DMN in L&D service access, and utilization. The use of DMN in these studies provides more nuanced insights limiting common overgeneralizations from the

erroneous assumptions that all Black women are the same, interact with the healthcare system similarly, or have the same overall maternity care needs. Moreover, the examination of all three most basic L&D characteristics (i.e., the attendant at birth, place, and method of delivery) and of the three most common pregnancy complications among Black women (i.e., gestational hypertension, eclampsia, and gestational diabetes) using a nationally representative sample covering a five-year period amplifies the generalizability of my findings. Lastly, this analysis of DMN and L&D characteristics is seminal by being the first study to explore these associations in a nationally representative, race-concordant yet diverse sample of Black women, and sets a benchmark for future research with similar aims.

Conclusions & Future Directions

This dissertation contributes to the growing body of maternal and reproductive health services research by highlighting the importance of going beyond dichotomizing maternal nativity when considering the provision of, experiences of, and policies related to improving quality of care, addressing care inequities, and eradicating disparities in L&D care in the US. While efforts are being made to prioritize and address the increasing US Black maternal mortality crisis,[23] there is still much work to be done, especially concerning the paucity of research on the L&D experiences and preferences of foreign-born Black women who account for nearly 10% of the overall US Black population.[24–28]

While these three studies are an important and relevant body of work, the author's findings are barely scratching the surface of the complex factors influencing the access, utilization, and lived L&D experiences of the diverse women that make up the Black Diaspora. Looking forward, the author intends to build upon my dissertation research and continue to explore the L&D care of Black women. The author is especially looking forward to collaborating with the women whom this research concerns for to build a Black women led, disaggregated database including quantitative, qualitative, and mixed methods data. These continued efforts will help maternity practitioners and health policy makers ensure access to quality, equitable, culturally appropriate, patient-centered, and effective care for all Black women.

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