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Adverse birth outcomes: Investigating the role of nativity and perceived racial discrimination among black mothers enrolled in Des Moines, Iowa healthy start.

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ADVERSE BIRTH OUTCOMES: INVESTIGATING THE ROLE OF NATIVITY AND PERCEIVED RACIAL DISCRIMINATION AMONG BLACK MOTHERS ENROLLED IN DES MOINES, IOWA HEALTHY START

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A Dissertation Approved on

April 20, 2023

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DEDICATION

The dissertation is dedicated to my mother,

Stacy Kelly-Taylor.

As a preterm infant you never stopped believing in my strength from day one, and today I stand before you as a product of your hard work, dedication, and perseverance.

Thank you and I love you!

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ABSTRACT

ADVERSE BIRTH OUTCOMES: INVESTIGATING THE ROLE OF NATIVITY AND PERCEIVED RACIAL DISCRIMINATION AMONG BLACK MOTHERS ENROLLED IN DES MOINES, IOWA HEALTHY START

Kendria Kelly-Taylor

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Birth outcomes for Black women in the United States (US) are disproportionately worse in comparison to non-Black women, even when controlling for potential confounders. Existing studies suggest foreign-born (FB) Black women present better birth outcomes in comparison to US-born (USB) Black women. Also, the longer FB Black women live in the US, the more their perinatal health advantage diminishes. Racial discrimination has been hypothesized as a potential reason for this decline. This dissertation investigates the relationship between nativity and adverse birth outcomes while also exploring how the reporting of racial discrimination impacts birth outcomes among FB and USB Black mothers who participate in Des Moines Healthy Start.

Secondary data (N= 1233, USB = 904, FB =329) from the Healthy Start database from 2000 to 2021 was used to examine the association between nativity, preterm birth (PTB) and small for gestational age (SGA). Primary data (N= 31, USB =4, FB = 27) was captured using a survey that measured three domains: perceived racial discrimination, perceived stress, and acculturation. Perceived Racial Discrimination was measured

using the Racial Microaggression Scale (RMAS). Mothers of singleton live births and self-identified as Black or African American were included in the study.

USB Black women presented higher odds of PTB (OR:1.65, 95% CI 1.13-2.40) and SGA (OR: 1.47, 95%CI .92-2.35) in comparison to their FB counterparts, yet after adjustment for covariates, this effect attenuated, and no significant differences were observed. Also, USB Black women reported higher scores on the RMAS. Among FB Black women, higher reports were observed among those who resided in the US for more than 5 years or migrated prior to 18 years of age. Additionally, the odds of having an adverse birth outcome increased for each additional experience of racial discrimination among FB Black women. The findings of our study suggest though FB Blacks mothers present a perinatal advantage, exposure to racial discrimination, contingent on the age of migration and the duration of residency, aids in the decline of their birth outcomes. This study provides a basis for future research in the areas of nativity, racial discrimination, and acculturation.

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I. INTRODUCTION

The global burden of preterm birth (PTB) and small for gestational age (SGA) are of public health concern. Estimates suggest that approximately 15 million babies worldwide are born preterm indicating a global preterm birth rate of approximately 11% (Walani, 2020). Globally, the burden of preterm births disproportionally impacts countries categorized as low-income. However, high-income countries, specifically the United States, rank in the top ten countries with the greatest number of preterm births (World Health Organization, 2018). Likewise, 32.5 million infants worldwide are born SGA (Lee et al., 2013; Osuchukwu OO & Reed DJ, 2022). Over the past two decades, the incidence of SGA in the United States has increased to as high as 29%, with a limited understanding of the causation (Ewing, Ellington, Shapiro-Mendoza, Barfield, & Kourtis, 2017).

US-born Black women experience the greatest burden of PTB, and SGA compared to other racial and ethnic groups in the United States. Currently, the preterm birth rate for Black women is 14.4%, which far exceeds the national average of 10.2% and the white PTB rate of 9.2.% (Centers for Disease Control and Prevention, 2020). Moreover, it is well known that Black infants have a higher incidence of SGA (Alexander, Kogan, Himes, Mor, & Goldenberg, 1999). Grobman et al., (2018) found that non-Hispanic Black women had an increased risk of all adverse birth outcomes across eight clinical sites in the United States. The prevalence of SGA among Non-Hispanic

Black women was 17.2%, the highest prevalence compared to other racial groups and more than 50% higher prevalence compared to non-Hispanic white women (PR: 8.6%) (Grobman et al., 2018).

Extensive research has examined the differences in birth outcomes across racial and ethnic groups, with significant research examining the Black-white disparity. In recent years, scholars have noted that solely focusing on the Black–white disparity hinders the full etiological understanding of factors associated with disparities in birth outcomes. This dissertation research will shift the lens and focus on the differences in birth outcomes among foreign-born Black women and US-born Black women to gain an understanding of how nativity and other factors may facilitate this disparity.

Research suggests foreign-born Black women present more favorable birth outcomes in comparison to US-born Black women even when adjusting for well-known behavioral, socioeconomic, and maternal health risk factors. Furthermore, the existing literature proposes that the longer foreign-born Black women live in the US, the more their perinatal health advantage diminishes, and their birth outcomes mirror those of US-born Black women. One possible theory is that living in the US exposes foreign-born Black women to racial discrimination that they may not otherwise have experienced in their home country if they were born in a black-majority region. Exposure to racial discrimination has been linked to poor health outcomes including cardiovascular disease, obesity, and cancer (R. T. Carter, Lau, Johnson, & Kirkinis, 2017b) Racial discrimination has also been associated with negative perinatal health outcomes including PTB and SGA (Alhusen, Bower, Epstein, & Sharps, 2016). Significant research has explored the relationship between experiences of racial discrimination and adverse birth outcomes

among US-born Black women (Nancy Dole et al., 2004; D. Misra, Strobino, & Trabert, 2010; Slaughter-Acey et al., 2016; Slaughter-Acey, Talley, Stevenson, & Misra, 2019) yet less research has explored this among foreign-born Black women.

The literature suggests that foreign-born Black women may perceive racial discrimination less than US-born Black women (Krieger, Kosheleva, Waterman, Chen, & Koenen, 2011) but research findings are few. Moreover, the literature suggests that the perception of racial discrimination among foreign-born women is contingent on the age of migration and length of US residency (T. P. Dominguez, E. F. Strong, N. Krieger, M. W. Gillman, & J. W. Rich-Edwards, 2009). In addition, foreign-born Black women live at the intersections of being female, Black, and foreign-born, thus constructing a unique experience that may impact birth outcomes (Hossin, 2020).

To date, there is no study that has quantitively examined the association between perceived racial discrimination and birth outcomes among foreign-born and US-born women. Dominquez and colleagues (2009) attempted to examine this association, yet due to limitations in sample size and prevalence of adverse birth outcomes effect estimates could not be determined (T. P. Dominguez et al., 2009). In addition, to our knowledge, there is no study that has examined the association between perceived racial discrimination and birth outcomes in Healthy Start, a federally funded program.

This dissertation explores the role of nativity and perceived racial discrimination and their impact on birth outcomes among foreign-born and US-born Black women who participate in Des Moines, Iowa Healthy Start Program.

II. OBJECTIVE, STUDY AIMS, HYPOTHESES

The objective of the study was to examine PTB and SGA among foreign-born and US-born Black women who participate in a federal Healthy Start program in Des Moines, Iowa, where there is a high population proportion of American Black and foreign-born Black clients. In addition, the objective of the study is to quantitatively explore the relationship between nativity, adverse outcomes, and social and behavioral factors. Furthermore, the study examines the differences in reporting racial discrimination between foreign-born and US-Born Black women and its impact on birth outcomes.

Study Aims and Hypotheses

Aim 1: To compare the rates of SGA and PTB among US-born and foreign-born Black women while adjusting for socioeconomic, behavioral, psychosocial, and maternal health conditions.

> *Ho: There will be no significant difference between rates of PTB and /or SGA among foreign-born Black women compared to rates of PTB and SGA among US-born Black women while adjusting for socioeconomic, behavioral, psychosocial, and maternal health conditions.*
>
> *Ha: Rates of PTB and SGA among foreign-born Black women will significantly differ as adjusting to rates of PTB and SGA among US-born Black women while controlling for socioeconomic, behavioral, psychosocial, and maternal health conditions*

Aim 2: To describe the reporting of racial discrimination among Black women based on their nativity status, age of migration, duration of residency in the United States, and other socioeconomic, behavioral, and maternal health characteristics.

Aim 3: To determine if (A) there is a crude association between perceived racial discrimination and adverse birth outcomes and (B) how the reporting of perceived discrimination differed by the length of residence in the US and age of migration among foreign-born Black women.

> *Ho: (A) There will be no significant association between perceived racial discrimination and adverse birth outcomes among foreign-born Black women.*
>
> *Ha: (A) There will be a significant association between perceived racial discrimination and adverse birth outcomes among foreign-born Black women.*
>
> *Ho: (2) There will be no significant difference in the reporting of perceived racial discrimination among foreign-born women who have lived in the US for less than 5 years compared to those who have lived in the US for 5 or more years or migrated to the US before age 18 compared to those who migrated to the US after age 18.*
>
> *Ha: (2) There will be a significant difference in the reporting of perceived racial discrimination among foreign-born women who have lived in the US for less than 5 years compared to those who have lived in the US for 5 or more years or migrated to the US before age 18 compared to those who migrated to the US after age 18.*

III. LITERATURE REVIEW

The purpose of the study is to explore the role of nativity and perceived racial discrimination and its impact on adverse birth outcomes among foreign-born and US-born Black women. Adverse birth outcomes refer to infant health problems resulting from complications of pregnancy and childbirth. Preterm birth and low birth weight are two commonly studied adverse birth outcomes, yet other examples include birth defects, infant mortality, and neonatal death for example. This review of literature will primarily focus on preterm birth and small for gestational age among Black women living in the US.

Definition of PTB and SGA

PTB is defined as the birth of a baby before 37 completed weeks of gestation (Centers for Disease Control and Prevention, 2020). PTB can be categorized into sub-groups including extremely preterm (less than 28 gestational weeks), very preterm (28-to-32-gestational weeks), and moderate to late preterm (32-to-37 gestational weeks). During the final weeks of pregnancy, vital organs including the brain, lungs, and liver undergo maturation. Immaturity of these organs can lead to complications and increase the risk of respiratory distress infections, hypoglycemia, and birth defects to name a few (Moster, Lie, & Markestad, 2008; Simmons, Rubens, Darmstadt, & Gravett, 2010; Swamy, Ostbye, & Skjaerven, 2008).

SGA is defined as an infant born below the 10th percentile of birth weight; specified by gestational age and sex (Ewing, Ellington, Shapiro-Mendoza, Barfield, & Kourtis, 2017). SGA infants comprise those who are constitutionally smaller due to genetic disposition and those who suffer from intrauterine growth restriction (IUGR). Maternal and environmental factors for including malnutrition, placental insufficiency, and pregnancy complications (i.e., preeclampsia) are common factors associated with IUGR (Damhuis, Ganzevoort, & Gordijn, 2021; Lesley Mccowan & Horgan, 2009). Often, SGA infants may also have low birth weight (LBW), yet these terms are not synonymous. Likewise, SGA is a common proxy for IUGR yet, not all SGA infants suffer from IUGR and vice-versa. Infants classified as SGA are also at an increased risk of infant death similar to preterm infants. Additionally, PTB and SGA are associated with neurocognitive disabilities, developmental delays, and increased risk of chronic adult diseases (Damhuis et al., 2021; Luu, Katz, Leeson, Thébaud, & Nuyt, 2016; Lme Mccowan et al., 2010)

Causal Mechanism of PTB and SGA

Preterm birth can be a consequence of 1) spontaneous preterm labor with an intact membrane, 2) maternal or fetus symptoms that promote iatrogenic preterm delivery, or 3) preterm premature rupture of membranes (PPROM). The onset of preterm labor is thought to be the product of multiple mechanisms that operate through distinctive pathways resulting in a transition from uterine quiescence (i.e., a stage of parturition) to preterm labor or PPROM (Goldenberg, Culhane, Iams, & Romero, 2008; Simmons et al., 2010). Common etiological pathways include infection/inflammation, uteroplacental hemorrhage, activation of the hypothalamic-pituitary-adrenal resulting from maternal or

fetal stress, uterine overdistension, and other immunological-related processes (Goldenberg et al., 2008; Simmons et al., 2010). Though no single pathway is clearly defined, each of these mechanisms described can be influenced by genetic variability and environmental factors.

SGA is a statistical notion of fetal size, often defined by less than 10% birthweight based on specified reference curves. To that end, SGA describes the differences in fetal size, not the underlying condition. Yet, SGA has been used interchangeably with IUGR due to ease of interpretation and the assumption that the smaller an infant the more likely it has experienced IUGR (Damhuis et al., 2021). Nonetheless, the primary underlying mechanism of SGA lies in placental insufficiency caused by impaired placental function. Thus, the fetus fails to reach its inherent growth potential resulting from a deprivation of oxygen and nutrition (Damhuis et al., 2021).

Factors Associated with PTB and SGA

Several risk factors have been investigated for PTB and SGA including biological, social, and environmental factors. Some well-documented risk factors for PTB include women with a history of preterm deliveries, multiple gestations, chronic medical conditions, and abnormalities of reproductive organs (e.g., short cervix) (Fuchs & Senat, 2016; Ville & Rozenberg, 2018). In addition, maternal ethnicity, age, healthcare accessibility, smoking/ alcohol use, negative social support, exposure to environmental pollutants, residing in a disadvantaged neighborhood, and stress have also been identified (Ncube, Enquobahrie, Albert, Herrick, & Burke, 2016). Some established factors associated with SGA include constitutional factors (e.g., maternal height and weight), maternal age, substance use, educational status, chronic medical conditions, and

hypertensive disorders during pregnancy (Lesley Mccowan & Horgan, 2009). The following section will cover the study's risk factors, including maternal age, ethnicity, smoking and alcohol use, prenatal care, hypertensive disorders, gestational diabetes, socioeconomic status, social support, depression, and maternal stress.

Maternal Age

Several studies have demonstrated the effect of maternal age on pregnancy outcomes (Ferre, Callaghan, Olson, Sharma, & Barfield, 2016; Khalil, Syngelaki, Maiz, Zinevich, & Nicolaides, 2013). Maternal age is a risk factor for PTB and SGA, as it can be indicative of additional risk factors associated with adverse birth outcomes. For example, Ferrè and colleagues (2016) examined the relationship between maternal age and age-specific rates of preterm birth in the US in 2007 and 2014. The study findings suggest the rate of overall PTB decreased largely due to the decline in teen pregnancies and births among mothers between the ages of 20 to 24 years old. Characteristics of this age group such as low socioeconomic status and smoking are contributing factors to preterm birth, thus as maternal age increased, there was a reduction in these characteristics. Additionally, the study identified that mothers in their mid-twenties to thirties faced pre-existing chronic conditions impacting their risk of PTB (Ferre et al., 2016).

Moreover, Khalil and colleagues (2013) investigated the association between maternal age and adverse pregnancy outcomes utilizing a retrospective cohort study design (Khalil et al., 2013). Maternal characteristics, medical history, and pregnancy outcomes were collected from mothers of singleton births at their first routine check-up post-delivery. Maternal age was examined as a continuous and categorical variable as

such <35 years, 35-39 years, and ≥ 40 years. Overall, the findings suggest that the risk of adverse pregnancy outcomes increases with age, with advanced maternal age (i.e., ≥ 40 years) having the greatest risk (Khalil et al., 2013). More specifically, this study found that after controlling for maternal characteristics and obstetric history, maternal age greater than 35 years was associated with a 46% increased risk of SGA and a 35% increased risk of iatrogenic PTB but no increased risk of spontaneous PTB. Furthermore, additional risk factors for SGA and iatrogenic PTB included being of a racial background other than white, smoking, chronic hypertension, assisted conception, and type II diabetes (Khalil et al., 2013).

Maternal Ethnicity

Ethnicity is commonly defined as Hispanic/Latina or non-Hispanic/Latina origin. Since the turn of the 21st century, researchers have observed that those who are Latina or Mexican-born origin present similar, and at times better, health outcomes compared to their non-Latina white counterparts even though they often present risk profiles that align with negative health outcomes (e.g., less educated, or lower socioeconomic status) (Valles, 2016). This observation has been coined the Hispanic Paradox, Latina epidemiologic paradox, or immigrant paradox in the epidemiologic literature (Bediako, Belue, & Hillemeier, 2015; Valles, 2016) Though several studies have cited this phenomenon among adverse birth outcomes (Fuentes-Afflick, Hessol, & Pérez-Stable, 1999; González-Quintero et al., 2006) recent literature has explored the nuanced of the phenomenon and showcase differences in perinatal outcomes based on nativity, length of residence, and racial classification (Bediako et al., 2015; Hoggatt, Flores, Solorio, Wilhelm, & Ritz, 2012; Sanchez-Vaznaugh et al., 2016; Valles, 2016). Moreover,

researchers have also investigated the immigrant paradox among mothers who racially identify as Black. Studies have found that among Black mothers, those of Hispanic descent present more favorable perinatal outcomes (Bediako et al., 2015; Green, 2014). Green (2014) investigated differences in birth weight among Non-Hispanic and Hispanic Black mothers who had a live birth record in the 2002 Vital Statistics Natality File. On average, infants of Hispanic Black mothers had the heaviest birthweight in comparison to Non-Hispanic Black mothers. Furthermore, those who identified as foreign-born Hispanic Black had significantly heavier infants, while US-born non-Hispanic Black mothers had the lowest birthweight infants. Furthermore, these differences were not fully explained by maternal characteristics or health behaviors (Green, 2014).

Similar findings were discovered by Bediako and colleagues' (2015) study that examined differences in birth outcomes, PTB, SGA, and LBW, among mothers who identify as Non- Hispanic Black, Black Hispanic, Hispanic, and Non-Hispanic White. Using the 2013 US Natality file (n= 2,970, 316 singleton births), Non-Hispanic Black mothers presented the highest prevalence of each birth outcome, followed by Black Hispanics, Hispanics, and then Whites. Across the birth outcomes, Black Hispanics presented higher rates compared to Hispanic Mothers, while lower rates compared to Non-Hispanic Black mothers. After adjustment of age, infant sex, marital status, maternal education, prenatal care, a recipient of the Women Infant and Child program, insurance, birth order, tobacco use, pre-pregnancy BMI, pregnancy weight gain, and maternal medical conditions, birth outcomes of Black Hispanics presented closer to Hispanic mothers than Non-Hispanic Black mothers, especially for LBW and PTB (Bediako et al., 2015). Hispanic origin presents a protective factor among Black mothers. Interestingly,

both studies highlighted that Black Hispanics present birth outcomes similar to Hispanic mothers while presenting risk profiles in alignment with Non-Hispanic Black mothers.

Tobacco and Alcohol Use

A well-established body of literature has investigated the relationship between tobacco use and prenatal outcomes. In 2000, a meta-analysis was conducted among 20 prospective studies examining the relationship between maternal smoking and PTB (N. R. Shah & Bracken, 2000). Mothers who smoked during pregnancy had a 27% higher risk of preterm delivery. Moreover, this study identified a dose-response relationship, with light smokers defined as 0-10 cigarettes per day having a lower risk of PTB in comparison to moderate and heavy smokers (N. R. Shah & Bracken, 2000).

Liu and colleagues (2020) investigated of the effect of maternal smoking before and during pregnancy and PTB (Liu et al., 2020). Mothers who smoked in their first and second trimesters had significantly greater odds of preterm labor compared to mothers who did not smoke while pregnant. A dose-response relationship was also observed between smoking and preterm labor (Liu et al., 2020).

Studies suggest that two key chemicals, nicotine, and carbon monoxide, can have significant negative impacts on the placenta and the developing fetus. Nicotine can cause vasoconstriction, which reduces blood flow to the placenta and can lead to decreased oxygen and nutrient delivery to the fetus. This can result in growth restriction, low birth weight, and preterm birth. While carbon monoxide binds with hemoglobin, and forms carboxyhemoglobin. This reduces the amount of oxygen that can be transported to the fetus, which can cause hypoxia in the developing fetus. This can also result in growth

restriction, low birth weight, and preterm birth (Goldenberg et al., 2008; Wagijo, Sheikh, Duijts, & Been, 2017).

Since the 1970s when alcohol was identified as a teratogen, researchers have explored its impact on various health outcomes including adverse perinatal outcomes (Albertsen, 2004; Nykjaer et al., 2014). Alcohol has been identified as a risk factor for adverse birth outcomes, yet this is contingent on the amount consumed during pregnancy (Henderson, Gary, & Brocklehurst, 2007; O'Leary & Bower, 2012; Patra et al., 2011). The most recent systematic review and meta-analysis conducted in 2011, reviewed 36 studies that utilized either cohort or case-control study design, examining LBW, PTB, or SGA, and providing estimates of the association between alcohol consumption to adverse birth outcomes. The systematic review and meta-analysis found a dose-response between alcohol consumption and adverse birth outcomes. For example, an increased risk of SGA was observed among mothers who consumed between 10 to 18 grams of alcohol per day which is equivalent to 1 to 1.5 drinks per day. An increased risk for PTB was observed with up to 3 drinks per day. The results of this analysis indicate that alcohol consumption is a risk factor for adverse birth outcomes with differential impact based on the average daily consumption.

Prenatal Care

The adequate utilization of prenatal care (PNC) is of primary concern to many public health interventions aimed at improving maternal and child health. Adequate prenatal care, defined by the American College of Obstetricians and Gynecologists, is prenatal care initiated in the first trimester with regular visits of increasing frequency as full-term approaches (*Guidelines for Perinatal Care* 2017). In practice, the criterion of

adequate prenatal care is defined as “initiated by 4 months gestation and at least 80% of expected visits”; while inadequate prenatal care is defined as “initiated after 4 months gestation or fewer than half of expected visits” based on the Adequacy of Prenatal Care Utilization Index (APNCU) (Kotelchuck, 1994).

Over the years, researchers have sought to estimate the magnitude of the effect of PNC and fetal outcomes. A general census is that inadequate or absent PNC is associated with LBW, PTB, and SGA. However, recently more scholars have suggested that quality of PNC may be more imperative than quality of visits. A recent study suggests PNC may be beneficial up to a certain amount, until imposing an increased risk of pregnancy intervention (e.g., caesarian section) without improvement of neonatal outcomes among low-risk women (E. B. Carter et al., 2016). Nonetheless, Partridge et al (2012) conducted a retrospective cohort study utilizing national health statistics data of 32 million births over 8 years to investigate the relationship between inadequate prenatal care and poor fetal outcomes. While a steady rise in adequate PNC was observed over the study period, increased PNC utilization was not distributed equally among all demographics. Inadequate PNC disproportionately impacted Black women, those who were less than 20 years of age, had less than a high school diploma, were single, and experiences poor birth outcomes. Furthermore, a linear relationship was observed between decreasing PNC utilization and increasing risk of infant deaths and subsequent perinatal mortalities (Partridge, Balayla, Holcroft, & Abenhaim, 2012).

Shin and colleagues (2019) examined the association of PNC adequacy and the risk of SGA and PTB using data from the Pregnancy Risk Assessment Monitoring System between 2004 to 2011 conditioned on Michigan residence (Shin & Song, 2019).

The findings of this study indicated that there was no significant difference in the risk of SGA among mothers whose utilization of PNC was considered inadequate compared to adequate based on the APNCU index. However, this finding may be due to a disproportionate number of teen mothers. Nevertheless, the results showed mothers who did not receive any PNC or less than recommended visits were at an increased risk of delivering SGA or PTB infants. Furthermore, mothers in the adequate-plus utilization category observed an increased risk of PTB compared to the adequate utilization category. Interpretations of these findings should be considered with caution for two reasons: (1) gestational age bias observed in the calculation of the APNCU index, and (2) the adequate-plus group includes high-risk mothers who require more prenatal care visits (Appleton, Kiley, Holdsworth, & Schell, 2019; Partridge et al., 2012). Although the effectiveness of prenatal care to reduce SGA and PTB is still debated, the literature supports that prenatal care is beneficial for identifying and reducing potential risk factors such as medical conditions and negative health behaviors that can directly impact the risk of SGA, PTB, and other infant outcomes.

Maternal Health Conditions

The effects of both hypertensive disorders during pregnancy and gestational diabetes are of growing concern on the risk of adverse pregnancy outcomes. Throughout the years there has been a drastic increase in these medical diagnoses in part to the global increase in obesity and maternal age thus affecting the health of millions of mothers worldwide (Moussa, Arian, & Sibai, 2014). Hypertensive disorders in pregnancy (HDP) include chronic hypertension, gestational hypertension, preeclampsia/eclampsia, and preeclampsia superimposed on chronic hypertension. In the US, these disorders account

for about 10-25% of maternal deaths, exceeding the global prevalence from hypertensive disorder, 5- 10%(Bramham et al., 2014).

In the recent meta-analysis of 152 cohort studies examining the association between HDP and pregnancy outcomes, Li and colleagues (2021) discovered that mothers with a hypertensive disorder experienced a significantly higher risk of SGA (OR: 3.39, 95% CI: 2.9–4.0) and PTB (OR: 4.20, 95% CI: 3.6–4.9), in addition to other outcomes including stillbirth, neonatal death, and congenital malformations compared to mothers without HDP (F. Li et al., 2021). While the heterogeneity of the effect of HDP on pregnancy outcomes persisted across the studies, this analysis was the first that provided a collective census of the effect of HBP while controlling for confounders and examining an array of pregnancy outcomes, a differential piece to the previous meta-analyses conducted (Bramham et al., 2014; F. Li et al., 2021).

Similarly, gestational diabetes, the onset of diabetes due to pregnancy, is associated with PTB, low Apgar score, macrosomia, and large for gestational age (Centers for Disease Control and Prevention, 2021). In the most recent systematic review of 156 studies inclusive of 7,506,061 pregnancies; researchers concluded that women with GDM had 51% higher odds of delivering a preterm infant (OR: 1.51, 95 CI: 1.126-1.80) and 57% higher odds of having an infant born large for gestational age (OR: 1.57, 95% CI: 1.25-1.97) after controlling for one of seven confounders (i.e., maternal age, body mass index, gestational weight gain, gravidity, parity, smoking, chronic hypertension) (Ye et al., 2022).

Socioeconomic Status

It is well documented that people of higher socioeconomic status (SES) tend to have better general health outcomes than those of lower SES. As a measure of societal position, SES is commonly measured by income, education, and occupation. Additional measures include area-based indicators such as neighborhood deprivation indices, poverty, and wealth (Campbell et al., 2018). Studies have demonstrated that higher SES serves as a protective factor against adverse birth outcomes (Blumenshine, Egerter, Barclay, Cubbin, & Braveman, 2010; Joseph et al., 2014; Whitehead, 2012) yet the magnitude of protection may not be equal across racial and ethnic groups (Braveman et al., 2015). Research has demonstrated that Black women of similar or higher SES status to white women still maintained a greater risk of PTB, SGA, and LBW (Braveman et al., 2015). Kothari and colleagues (2016) observed that the protective effect of SES on birth outcomes is substantially different based on the racial diversity (or lack thereof) of one's residential space. Black women of higher SES residing in predominately white neighborhoods experienced the worst outcomes, yet Black women of higher SES residing in predominately Black neighborhoods experienced the best outcome (Kothari et al., 2016). This suggests that SES does not fully explain racial disparities in birth outcomes, the influence of SES on birth outcomes is contingent on the interplay of additional unknown socio-environmental factors.

A review of the literature suggests there are many factors associated with the racial disparities of adverse birth outcomes. However, SES remains an important indicator of birth outcomes between and among racial demographics. Mothers of lower SES are more likely to engage in risky behaviors such as smoking and alcohol use and

are less likely to have access to health care services, thus increasing their risk of adverse birth outcomes (Räisänen et al., 2013).

Social Support: Marital Status

Marital status can serve as a protective or risk factor for adverse birth outcomes. It is well-studied that mothers who are married have a lower risk of unfavorable birth outcomes compared to mothers who are cohabitating and/or unmarried. In a systematic review and meta-analysis, the findings highlighted a gradient in adverse birth risk based on marital status with married women exhibiting the lowest risk of PTB, SGA, and LBW, followed by cohabitating women than those who were unmarried (P. S. Shah, Zao, & Ali, 2011). The underlying premise linking marital status and birth outcome includes a lack of social support and stability, an increase in risky health behaviors, and a lack of social acceptance among unmarried mothers that facilitate social stigmatization (P. S. Shah et al., 2011). Additionally, risk profiles among married, cohabitating, and single mothers, generally present differences in underlying factors attributing to the risk of adverse birth outcomes including food security, physical activity, and health conditions (Shapiro et al., 2018).

In more recent literature, scholars have examined the effect of marital status in relation to maternal age and differences among racial groups. Shapiro et al. (2018) observed that as maternal age increased, single mothers had an increased risk of PTB in comparison to married mothers (Shapiro et al., 2018). Furthermore, Hibbs et al. (2018) examined the racial differences in maternal age patterns among mothers of preterm infants according to marital status and lifelong neighborhood income. They found that single Black mothers who reported lifelong residence in lower-income neighborhoods

presented a higher risk of PTB with an increase in age, a phenomenon referred to as weathering (Hibbs, Rankin, DeSisto, & Collins, 2018).

Psychological Distress: Depression

Over the last several decades, researchers have started to evaluate the association between prenatal depression and birth outcomes. Psychological distress such as depression during pregnancy has shown an association with sub-optimal perinatal outcomes including PTB, SGA, and LBW (Accortt, Cheadle, & Dunkel Schetter, 2015; Kim et al., 2013; X. Li et al., 2020). A recent meta-analysis conducted in 2015 examined the effect of perinatal depression on LBW and PTB. Of the 95 prospective studies examined, the authors concluded that prenatal depression is associated with adverse birth outcomes. This association was more consistent among studies where LBW was the outcome of interest. (Accortt et al., 2015). While this meta-analysis showed an association between depression and adverse birth outcomes, it is important to consider the influence of different depression measurements. For example, the Center for Epidemiologic Studies Depression Scale (CES-D), Edinburgh Postnatal Depression Scale (EPDS), and the Beck Depression Inventory (Accortt & Schetter, 2014) all screen for depression symptomatology. However, caution should be used when comparing different studies that used differed depression screening tools as each tool has unique questionnaires and diagnosis thresholds (Accortt & Schetter, 2014; Heller, Draisma, & Honig, 2022). For example, Kim et al., (2013) retrospectively evaluated the association between prenatal depression and adverse birth outcomes among Black mothers who delivered at the University of Pennsylvania hospital. Mothers that presented mild depression based on an EPDS score greater than 10, were at elevated risk of PTB, IUGR,

LBW, and preeclampsia (Kim et al., 2013). While investigating the association of antenatal depression and pregnancy complications in Li and colleague's (2020) studies, those who presented an EPDS score of 12 or greater were at an increase of LBW but not PTB and SGA (X. Li et al., 2020). This showcases the differences in associations that exist based on specified cut points specifically using the EPDS scale.

Additionally, researchers have investigated the role of maternal mental health as a potential mediator. A mediator is defined as an intermediate step in the causal pathway between exposure and outcome. Specifically regarding PTB, several socioeconomic factors have been conceptualized as potential meditators contributing to the inequalities in PTB (Mchale et al., 2022). Over the last decade, there has been rapid development in the approaches to assess meditation among observational studies to improve causal interpretations. To assess mediation, several assumptions must be met to determine the direct and indirect effect: (1) control for expose-outcome confounding, (2) control for meditation-outcome confounding, (3) control for exposure-meditation confounding, and (4) no meditation-outcome confounder can be caused by the exposure (VanderWeele, 2016). If these assumptions hold true, we can assess mediating through the counterfactual framework.

The most recent systematic review conducted in 2022 examined studies that explored mediation among known socioeconomic risk factors and preterm birth. Homing in on mental health variables including depression, stress, and anxiety; the review identified six studies that explored the indirect effect of these variables on the relationship between socioeconomic status and preterm birth. Some studies determined the effect of depression and anxiety to reduce the effect of SES on PTB by 22% (Mirabzadeh et al.,

2013) while Mirsa and colleagues (2001) determine the effect among Black mothers to be 44% (D. P. Misra, O'Campo, & Strobino, 2001).

Maternal Stress

The effects of stress on pregnancy have gained much attention over the years. Though the mechanism is poorly understood, it is hypothesized that maternal stress might influence fetal development via physiological changes impacting the hypothalamic-pituitary-adrenal axis, inflammatory mechanism, and stress hormones (Glover, O'Conner, & O'Donnell, 2010; Leimert & Olson, 2020; Monk, Lugo-Candelas, & Trumpff, 2019). While researchers have suggested that experiences of stressful events may have a potential causal relationship to adverse birth outcomes, differences in sample size, study design, confounding assessment, and measurement of stress have yielded inconsistent findings (Grigoriadis et al., 2018; Hansen Precht, Kragh Andersen, & Olsen, 2007; Morgan, Christensen, Skedros, Kim, & Schliep, 2022). The most recent systematic review and meta-analysis conducted by Ding et. al., (2021) featured 31 studies that measured stressful events and at least one of three adverse birth outcomes, PTB, SGA, and LBW. Their findings support that stressful life events are associated with adverse birth outcomes with varying effects depending on the assessment of stressful events (i.e., during or after pregnancy) (Ding et al., 2021). Furthermore, the findings suggest the need for more prospective studies that examine an array of stressful events to better understand the relationship between stress and adverse birth outcomes. Acknowledging that stress takes many forms to fully understand the impact, future research must investigate various stress measures, their occurrence, and their intensity (Ding et al., 2021).

Black Immigrant Health: An Overview

Through the years there has been an increased interest in the health of foreign-born Black immigrants residing in the US. Currently, there are approximately 4.5 million foreign-born Black immigrants living in the US (Palarino, 2021) a significant increase from 800,000 in the 1980s (Anderson, 2017). Before the Immigration and Nationality Act (also known as the Hart-Celler Act) of 1965, there was limited voluntary migration of Africans to the United States resulting from restrictive policies that overemphasized preference for European immigrants while denying entry to African immigrants (Palarino, 2021). The Hart-Celler Act of 1965 was a critical legislation that alleviated previous restrictive policies, expanded the classification for refugee and asylum seekers, and introduced the diversity visa (Palarino, 2021; Venters & Gany, 2011). Thus, from 1970 to 2000 the US observed a ten-fold increase in African-born immigrants, with the majority self-identifying as Black (Anderson, 2017).

Despite the growing influx of Black immigrants, research among this population has been limited in comparison to other immigrant populations. For example, the healthy immigrant effect, a well-studied paradox among Hispanic immigrant populations, is less understood among Black immigrants (Ichou & Wallace, 2019; Viruell-Fuentes, Mirand, & Abdulrahim, 2012). Research suggests that Black immigrants present a health advantage compared to their US-born counterparts, indicating that migration selection, a facilitator of the immigrant health paradox, may hold, yet this is presumptive (Ichou & Wallace, 2019; Palarino, 2021). Moreover, aspects such as duration in the US and acculturation processes may operate differently for Black immigrants due to the historically racialized structure that undoubtedly stigmatizes Black populations residing

in the US (Elo, Mehta, & Huang, 2008). Moreover, the existing literature has further identified that the Black immigrant health advantage may be contingent on the sending country. For example, studies have investigated the differences in health outcomes among Black immigrants who migrated from Africa verse the Caribbean countries. Among these groups, Black African-born immigrants have better health outcomes compared to Black Caribbean-born immigrants. In fact, Black African-born immigrants often have better health outcomes compared to US-born whites (Elo, Vang, & Culhane, 2014; Palarino, 2021). Additionally, a study by Acedevado and colleagues (2005) demonstrated that foreign-born status among Black mothers was more protective than that similar status among white mothers (Acevedo-Garcia, Soobader, & Berkman, 2005).This study asserts that foreign -born status among Black women should be distinguished from other racial and ethnic groups, as it may not operate the same across all racial and ethnic lines.

Racial Disparity in Birth Outcomes

Black infants carry the greatest burden of adverse birth outcomes compared to other racial and ethnic groups. Research has examined factors that contribute to the differences across racial groups, with a primary focus on Black and white infants (Ely & Discroll, 2019). Solely focusing on the Black-white disparity does not fully explore other risk factors associated with racial disparities in birth outcomes (Montoya-Williams, Barreto, Fuentes-Afflick, & Collins, 2022).

US-born Black women are disproportionately affected by adverse birth outcomes in comparison to foreign-born Black women. Studies suggest foreign-born Black infants are less likely to be premature, LBW, and/or SGA when compared to US-born Black infants (Acevedo-Garcia et al., 2005; Belanoff, Alade, & Almeida, 2022; Cabral, Fried,

Levenson, Amaro, & Zuckerman, 1990; Elo et al., 2014; Mckenzie-Sampson et al., 2021; Taylor & Sarathchandra, 2016; Wasse, Holt, & Daling, 1994). Some studies have found that foreign-born Black women present a more favorable risk profile (i.e., higher education, married, and less likely to smoke) compared to US-born Black women (Cabral et al., 1990; Mckenzie-Sampson et al., 2021; Wasse et al., 1994).

The epidemiologic literature provides evidence that even when controlling for well-known behavioral, socioeconomic, and maternal health risk factors, foreign-born Black women have more favorable birth outcomes (see Table in Appendix A) Further, the existing literature suggests the longer foreign-born Black women live in the US, their perinatal health advantage diminishes, leading to rates of adverse birth outcomes similar to US-born Black women. These changes in health advantages have been observed as early as one generation post-migration (Andrasfay & Goldman, 2020; Collins, Wu, & David, 2002).

One possible explanation is that living in the US exposes foreign-born Black women to racial discrimination they otherwise may not have experienced in their country. Acculturation is the process of learning and adapting to the host's country while maintaining values, norms, beliefs, etc., of the country of origin (Fox, Thayer, & Wadhwa, 2017). Though it has been acknowledged as a contributing factor to immigrant health; it often averts the impact of historical, political, and cultural components and their construction of health (Montoya-Williams et al., 2022).

In the United States, one component to consider is racism. Drawing from Geronimus's work, exposure to racial discrimination as a consequence of residing in a society that stigmatizes Black people erodes the health of Black women through the

accumulation of stress (A. Geronimus, M. Hicken, D. Keene, & J. Bound, 2006). Exposure to racial discrimination has been linked to poor health outcomes, specifically PTB and SGA among US-born black women (Alhusen, Bower, Epstein, & Sharps, 2016; Larrabee Sonderlund, Schoenthaler, & Thilsing, 2021).

Length of Residence in the US and Birth Outcomes

Recently, there has been an emerging body of literature exploring the role of length of residency in the US on pregnancy outcomes among foreign-born Black women. Elsayed and colleagues (2019) examined the association between the duration of residence in the US and PTB and length of gestation among 104 foreign-born Black mothers and 340 US-born Black mothers who delivered in Newark, New Jersey from 2013 to 2014. Foreign-born Black mothers were categorized as "recent" or "long-term" immigrants defined as residing in the US for less than 5 years or 5 or more years, respectively. The study found that foreign-born Black mothers presented higher gestational length compared to US-born Black mothers. Also, duration of residency was inversely associated with gestational length thus, foreign-born Black mothers who have resided in the US for at least 10 years had similar differences in gestational length compared to US-born Black mothers, even after adjusting for socioeconomic and social/behavioral variables. This suggests that over time the health advantage diminishes among foreign-born Black mothers (Elsayed, Amutah-Onukagha, Navin, Gittens-Williams, & Janevic, 2019). Minhas et al (2022) exhibited similar findings when examining the risk of PTB by maternal nativity status and length of US residence among mothers of the Boston birth cohort. Among the 2699 Non-Hispanic Black women (1607 US-born; 1092 foreign-born) the odds of PTB were lower for foreign-born Black women

in comparison to US-born Black mothers even after adjustment for sociodemographic characteristics, health behaviors, and maternal health conditions (aOR: 0.76, CI .65-.97). In addition, foreign-born Black mothers with less than 10 years of residence had a significantly lower odds of PTB comparison to US-born Black women (aOR; 0.57, CI .43-.75), whereas foreign-born Black women whom duration of residency was 10 years and more did not significantly differ in their odds of PTB from US-born women (aOR: 0.76, CI .54-1.07) (Minhas et al., 2022). These two studies echo that the longer foreign-born Black women reside in the US their birth outcomes deteriorate. A recent study acknowledges that this may be in part to foreign-born Black women with longer residency may have a higher allostatic load, and thus at an increased risk of adverse birth outcomes, in comparison to those who have lived in the US for a shorter time, yet more research is needed (Minhas et al., 2022)

Maternal Stress: An Expansion

Stress across the lifespan and during pregnancy has been investigated to explain the racial disparity in PTB and SGA. Measuring stress can be methodologically difficult as stress is multidimensional in meaning and interpretation (Dole et al., 2003; Slaughter-Acey, Talley, Stevenson, & Misra, 2019) yet, research suggests higher lifetime exposure to chronic stress may increase the risk of adverse birth outcomes. These findings were most prevalent among ethnic minority groups (Latendresse, 2009). Moreover, studies have identified that African Americans have a greater burden of stress compared to other racial and ethnic groups in terms of frequency, type, and severity (T. P. Dominguez, Dunkel-Schetter, Glynn, Hobel, & Sandman, 2008; T. P. Dominguez, Schetter, Mancuso, Rini, & Hobel, 2005). Specifically, studies have examined the effects of different forms

of stress including gender and racial discrimination, experiences of trauma, and financial hardship before and during pregnancy and its association with PTB, LBW, and SGA (Alhusen et al., 2016; Almeida, Becares, Erbetta, Bettegowda, & Ahluwalia, 2018; Dole et al., 2003). A substantive body of literature has identified stress, particularly maternal stress, as a well-known risk factor for adverse birth outcomes.

Racism and racial discrimination are unique multifaceted chronic stressors that expand across an array of behavioral, sociodemographic, and psychological factors that influences health. Literature suggests racism serves as a fundamental cause of diseases, facilitating the ongoing health inequalities (Phelan & Link, 2015; Viruell-Fuentes et al., 2012). Scholarly articles propose exposure to racism and racial discrimination operate via stress pathways that negatively influence the physiological function of the neuroendocrine, immune, and cardiovascular systems (Tyan Parker Dominguez, 2011). Adverse functioning of these systems due to the accumulation of stress has been hypothesized to prematurely age a female's reproductive systems (A. Geronimus et al., 2006). Thus, a growing body of research is examining the role of racial discrimination and its direct and/or indirect impact on physical health, specifically birth outcomes (Alhusen et al., 2016).

Racial Discrimination

Racism continues to play a central role in the production of social and economic inequalities hindering health and the pursuit of health. Racism has been investigated as a key factor in health disparity research as it is the most prevalent form of oppression in the US (R. T. Carter, Lau, Johnson, & Kirkinis, 2017b). Moreover, scholars have postulated that to address the long-standing racial inequalities in health we must address racism as a

root cause of these inequalities (Phelan & Link, 2015). Racism is defined as "a system of structuring opportunity and assigning value based on the social interpretation of how one looks, that unfairly disadvantages some individuals and communities, unfairly advantages other individuals and communities, and saps the strength of a whole society through the waste of human resource" (C. P. Jones, 2018). Scholarship has described racism as operating in three domains: institutional, personally mediated, and internalized (C. Jones, 2000). A growing body of literature has focused on individual-mediated racism (i.e., personally meditated) and health, with increasing research zooming in on how day-to-day experiences of racism and racial discrimination impact health.

Racial discrimination is conceptualized as a stressor that may be harmful because it is arbitrary, uncontrollable (Williams & Mohammed, 2009), pervasive, and induces a state of anticipation and worry (Sawyer, Major, Casad, Townsend, & Mendes, 2012). A growing body of evidence has investigated experiences of racial discrimination and poor health outcomes, with much of the literature reflecting the disproportionate reporting of experiences from Black Americans (R. T. Carter, Lau, Johnson, & Kirkinis, 2017a). In more recent years, research has examined the relationship between perceived racial discrimination and health among foreign-born populations. Although not conclusive, evidence suggest perceived racial discrimination is associated with poor mental and physical health conditions, negative health behaviors, and quality of healthcare among foreign-born populations (Gee, Ro, Shariff-Marco, & Chae, 2009; Noh, Kaspar, & Wickrama, 2007; Ryan, Gee, & Laflamme, 2006; Szaflarski & Bauldry, 2019). Moreover, studies suggest that foreign-born people are less likely to report experiences of perceived racial discrimination in comparison to their US-born counterpart (Gee et al., 2009;

Lauderdale, Wen, Jacobs, & Kanduka, 2006). Factors including the age of migration and length of stay in the host country may differentiate exposure reporting among foreign-born Black women. For example, Krieger and colleagues (2011) found that in general US-born Black reported more experiences of racial discrimination compared to their foreign-born Black counterparts. Interestingly though, among foreign-born Blacks who reported experiences of racial discrimination, there was a significant increase in reports among those with longer duration of residence in the US (Krieger, Kosheleva, Waterman, Chen, & Koenen, 2011).

The differences in self-reported discrimination may be due to differences between foreign-born and US-born racialization processes from the timeline of exposure to discrimination and immigrant opposition to identify with their minority status (T. P. Dominguez, E. F. Strong, N. Krieger, M. W. Gillman, & J. W. Rich-Edwards, 2009; Viruell-Fuentes et al., 2012). Racial discrimination is known to yield negative health outcomes yet more research is needed to further understand the complexities in which this operates, especially among immigrant populations. Furthermore, future research should evaluate the association between racism and other health outcomes to better understand the impact racial discrimination has on health. The following section will focus on the relationship between self-reported racial discrimination and adverse birth outcomes.

Perceived Racial Discrimination and Birth Outcomes

The literature suggests that self-reported experiences of racial discrimination are associated with an increased risk of adverse birth outcomes, yet findings are ambiguous. For example, the findings of a case-control study among US-born Black women suggest

that mothers of preterm infants reported greater exposure to racial discrimination in public settings in comparison to mothers of full-term infants (OR: 2.5 95%; 95 CI: 1.20-5.20) (Rankin, David, & Collins, 2011). Dole and colleagues (2004) utilized a prospective cohort study design to examine the relationship between psychosocial factors and the risk of preterm birth among white and Black mothers. The findings of this study demonstrated that African American mothers who reported higher levels of racial or gender discrimination were more likely to deliver preterm (RR: 1.80, 95 CI: 1.10-2.90) (Dole et al., 2004). Among Black and Latina women, perceived discrimination was associated with greater odds of LBW in a study conducted by Earnshaw and colleagues (2013); however, this relationship was mediated by depressive symptoms (Earnshaw et al., 2013). Misra and colleagues (2010) discovered among a sample of low-income African American women, lifetime exposure to racism measured by the Racism and Lifetime Experience Scale was not associated with PTB. However, the interaction between racism, depression, and stress was a significant predictor of PTB (D. Misra, Strobino, & Trabert, 2010). Slaugther-Acey and colleagues (2019) examined the relationship between personal or group racism, and SGA using the brief form of the Racism and Lifetime Experience Scale questionnaire. Group racism was defined as racial discrimination experienced by family, friends, or other members of a racial/ethnic group. In the unadjusted analysis, neither personal nor group racism was associated with SGA. However, in the adjusted modal, when age was examined as an effect modifier, overall and group racism was positively associated with SGA for women 25 years and older. Personal experiences of racism were not significantly associated with SGA. (Slaughter-Acey et al., 2019).

To date, only one study examined the differences in perceived racial discrimination between foreign-born Black and US-born Black pregnant women (T. P. Dominguez et al., 2009). Due to the limited sample size and the low prevalence of adverse birth outcomes, the study lacked statistical power to determine estimates of the effects of self-reported racism and birth outcomes. Yet the findings of the study provide insight into differences in self-reported racism by nativity. Exposure to racial discrimination was captured using the adapted version of the Experiences of Discrimination questionnaire (Krieger, Smith, Naishadham, Hartman, & Barbeau, 2005) highlighting type (i.e., personal versus group) and timing (i.e., childhood versus adulthood). The main findings revealed that US-born Black pregnant women self-reported more experiences of personal and group racial discrimination as compared to their foreign-born counterparts, while controlling for age, income, and lack of resources in childhood. Furthermore, experiences of racial discrimination extended across a greater number of life domains, with US-born Black women three times more likely to report experiences of personal racism exposure during pregnancy. Moreover, among foreign-born women, those of Caribbean ancestry reported more racial discrimination experiences than those of African ancestry. In addition, foreign-born women who migrated to the US before the age of 18, reported more experiences of discrimination in comparison to those who migrated after the age of 18 years (T. P. Dominguez et al., 2009).

Biological Mechanism to Stress

Allostatic load, a widely accepted theory, suggests long-term physiological consequences to the cardiovascular, nervous, endocrine, and immune systems resulting

from an accumulation of stress over the life course (Boullier & Blair, 2018). Stressful life events, including the experiences of racial discrimination, can lead to activation of the sympathetic nervous system and the hypothalamic-pituitary-adrenal (HPA) axis (Leimert & Olson, 2020). These stressors activate the HPA axis, releasing inflammatory hormones, cortisol, and neurotransmitters to adapt to the stress (i.e., allostasis). This response to a stressful event is normal. However, experiencing chronic stress can overload the body's natural HPA axis response. If left unabated, chronic stress and subsequent over-activation of the HPA axis may inhibit a return to the baseline homeostasis (Leimert & Olson, 2020). The dysregulation of these pathways can cause long-term consequences aiding in the "wear and tear" of the body and mind (Leimert & Olson, 2020; Olson et al., 2015). Experiences of racial discrimination have been identified as a psychosocial stressor eliciting a chronic stress response (Alhusen et al., 2016).

The weathering hypothesis suggests a proportion of Black women's reproductive health is diminished due to a higher allostatic load in comparison to their white counterparts. This hypothesis postulates that this decrease in Black women's reproductive health is a product of residing in a society historically rooted in a racist ideology that perpetuates the oppression of Black women (A. T. Geronimus, M. Hicken, D. Keene, & J. Bound, 2006). e

Theoretical Underpinning

Alongside the weathering hypothesis, the contributions of Critical Race Theory (CRT) and Intersectionality provide conceptual meaning underpinning this dissertation study. The term "Critical Race Theory" first emerged in 1989. CRT emerged after law students and faculty members believed the hiring and matriculation decisions were a

practice of institutionalized racism introduced (Ford & Airhihenbuwa, 2010a). Unlike many social science theories, CRT is not a typical behavior theory, but a methodology to help researchers establish and main equity in research. Over the decades, CRT has expanded and is recognized as a transdisciplinary methodology rooted in social justice and race equity (Ford & Airhihenbuwa, 2010a).

The four main characteristics of CRT include (1) Race Consciousness, (2) Contemporary Orientation, (3) Centering on the margins, and (4) Praxis (Ford & Airhihenbuwa, 2010a). Briefly, race consciousness is a fundamental tenant of CRT, emphasizing the issues associated with racialization (i.e., how does one's race, a social construct, contribute to health?). Implementing a race-conscious orientation to research provides an opportunity to explore non-racial factors associated with health while simultaneously exploring racial factors such as discrimination that are not well understood (Ford & Airhihenbuwa, 2010b). Contemporary Orientation refers to the importance of place, time, and social position. Researching racism should reflect the most relevant aspects as it is constructed today (Ford & Airhihenbuwa, 2010a). Though overt occurrences of racial discrimination still occur, in recent years racial discrimination can also be exemplified through more subtle and inconspicuous acts (i.e., racial Microaggression). Centering on the margins seeks to shift the perspective in which knowledge revolves from the mainstream (i.e., dominant group) to the marginalized group (Ford & Airhihenbuwa, 2010b). CRT suggests that often when we seek to understand issues that disproportionally affect marginalized communities our knowledge is restricted to best practices acquired from working amongst majority populations. Failure to consider the perspective of the marginalized may perpetuate the stigmatization

of these groups and limit our ability to gain useful information. Therefore, shifting the perspective in which knowledge is obtained can assist in reducing undue racial disparities. The final characteristic of CRT is praxis which aims to not only understand inequities but develop strategies for eliminating them (Ford & Airhihenbuwa, 2010b). Specific to this study, CRT will assist in guiding the quantitative measure of interest to reflect a relevant expression of racial discrimination. In addition, switching the focus from the Black-white disparity, arguably the mainstream approach to measuring differences in perceived discrimination and birth outcomes, to examining between racial lines to gain a different understanding of the effects of racism among Black women and their birth outcomes.

The concept of intersectionality has its roots in Black feminism and critical race ideology. In 1989 the term intersectionality was coined by legal scholar and Black feminist Kimberley Crenshaw. Her work shed light on the unique experiences of Black women beyond a reductionist view of being just Black or just a woman. Crenshaw suggested that there was an interactive effect of these identities that facilitated marginalization beyond being just Black, or just a woman. For example a "Black woman" may simultaneously experience the negative effect of both racism and sexism(Settles, 2006). Expanding in its original framework, intersectionality encompasses the multitude of identities and social powers that influences one's identity. Scholars have suggested this framework can be used to further understand the health of immigrants (Viruell-Fuentes et al., 2012). Calling scholars to expand beyond the cultural factors, Hossin's theoretical use of intersectionality accounts for the combined impact of cultural and structural factors

attributing to immigrant's health (Hossin, 2020), specifically alluding to the distinctive experiences of foreign-born Black women.

Conceptual Model

One way to portray mechanisms in which selected risk and/or protective factors are associated with a health outcome is to create a conceptual model. Conceptual models represent potential causal pathways between exposure and outcome of interests (Brady et al., 2020). This conceptual model illustrates theoretical paths between nativity and adverse birth outcomes by way of structural and individual-level factors. This model highlights variables that may confound, meditate, or moderate the relationship between nativity and PTB/ SGA. The italicized bullets represent variables beyond the scope of this study yet are left in the model to provide a more comprehensive illustration (Appendix B).

Summary

The purpose of this review was to provide information from existing literature that elucidates the relationship between nativity, perceived racial discrimination, and adverse birth outcomes among foreign-born and US-born Black women. US-born Black women experience the worst birth outcomes compared to other racial and ethnic groups, including foreign-born Black women. The existing disparities have yet to be explained by known risk factors such as socioeconomic status, education, and prenatal care. The biomedical literature suggests that chronic stress may increase allostatic load, which may harm fetal development. To that end, Black women may be at increased risk from chronic stress due to perceived racial discrimination and other intersectional dimensions of historically marginalized groups. While this theoretical pathway between racial

discrimination and adverse birth outcomes exists in the literature, little is known about the differences in perceived racial discrimination and its subsequent effect on birth outcomes between US-born and foreign-born Black women. Additionally, little is known about the effect perceived racism may play on birth outcomes between these two groups. Given the known effects of chronic stress on health and how racism can lead to chronic stress, it may be of interest to compare birth outcomes between US-born Black women and foreign-Born Black women. While these two groups may self-identify as Black, their perceptions of racism and subsequent stress may be different due to cultural differences and/or total time of exposure to potential racial discrimination.

IV. METHODS

Study Design

A cross-sectional analysis of secondary and primary data was used to examine the study aims. This study was approved by the University of Louisville Institutional Review Broad (IRB: 22.0014). Secondary data, used in Aim 1, was derived from the Des Moines Healthy Start Initiative data set, which contains participant data for all Healthy Start clients between 2000 and 2021. Primary data, used in aims 2 and 3, was collected from participants who were either previously or currently enrolled in the Des Moines Healthy Start/ Empowerment Initiative at the time of the study.

Study Site

Secondary and primary data were ascertained from Des Moines, Iowa Healthy Start Initiative clientele. Healthy Start is a federally funded initiative originally implemented in 1991 to target and prevent infant mortality in the US. Healthy Start initiative seeks to improve the well-being of women, infants, and children by addressing underlying factors that perpetuate maternal and child health inequities. Program projects target issues related to adequate prenatal care, access to healthcare, nutrition, housing, and psychosocial support.

The Des Moines Healthy Start program was established in 1997. Aligning with the fundamental tenants of Healthy Start, the program caters to women, infants, children (up to 18 months), and partners with the primary goal of reducing disparities in birth

outcomes. Based on the most recent reported, in 2019 the program served over 800 mothers and expectant mothers, providing comprehensive support services for women and their communities.

Study Population

The target study population was mothers of live births. The inclusion criteria for all three study aims were as followed: (1) mother of a singleton live birth enrolled in the Des Moines Healthy Start program and (2) self-identified as Black and/or African American. Mothers were excluded from the study if one of these criteria were met: (1) mothers who gave birth to multiple gestations, (2) did not self-identify as Black and/or African American, (3) lacked information on birthplace, and (4) who were younger than 18 years of age at enrollment in Healthy Start. A non-probability convenience sampling scheme was utilized to recruit eligible study participants for study aims 2 and 3.

Study Recruitment

For study aims 2 and 3, study participants were identified by Healthy Start case managers. Prior to recruitment, case managers were informed of the study purpose and eligibility criteria in a one-hour session hosted by the principal investigator (PI). In addition, each case manager was provided a study recruitment flyer (Appendix C) and a one-page snapshot to assist in recruitment efforts (Appendix D). Eligible study participants were directly provided with the survey website via a link and/or QR code to complete the survey. Participants whose primary language was not English were provided translation services through Healthy Start upon request.

Data Collection

Two sources of data were utilized in this study. To assess the first aim secondary data was ascertained from the Healthy Start database. All available data from 2000 to 2021 were utilized. Healthy Start captures a variety of data relating to maternal and child health indicators. To properly acquire relevant variables and ensure proper usage of data, a statement of work and data agreement subject to the Iowa Department of Public Health and Des Moines Healthy Start program were established and approved before obtaining participant records. Primary data was collected using a survey instrument to address study aims 2 and 3 (Appendix E). A preamble was used to gain informed consent for each study participant (Appendix F). Primary data was collected using REDcap, a secure web-based platform approved by the University of Louisville for data collection and management. All data was secured on a password-locked computer.

Study Instrument

The study survey instrument captured experiences of racial discrimination, perceived stress, and variables associated with acculturation (i.e., age of migration, and length of residency in the US). The development of the Racial Microaggression Scale (RMAS) by Torres-Harding and colleagues expands the discrimination literature by addressing ambiguous and subtle forms of discrimination experienced by people of color, namely racial microaggressions. The scale highlights two concepts--microinsults and microinvalidations. Originally introduced by Sue and colleagues in 2007, microinsults are occurrences that are perceived as offensive, while microinvalidations are occurrences that promote one to feel devalued, ignored, or delegitimized (Torres-Harding, Andrade, & Romero Diaz, 2012).

The original scale in the RMAS included 52 questions that assessed 11 domains. Following the exploratory factor analysis amongst a diverse sample, a six-factor solution was deemed most numerically efficient reducing the scale down to 32 items covering six domains: invisibility, criminality, low-achieving/undesirable culture, sexualization, foreigner/not belonging, and environmental invalidations. Table 2 provides the definition, the number of items per domain, a sample question, and the original internal consistency score based on the validation study. RMAS measures occurrence and severity on a 4-point Likert-type scale. For each item, respondents were asked how often they experienced a racial microaggression (0= never, 1= a little/rarely, 2= sometimes/a moderate amount, 3= often/frequently); if a respondent identified experiencing at least one (i.e., scored 1 or higher on occurrence) they were asked to indicate how bothersome/stressful the experience was for them (0=not at all, 1=a little, 2= moderate level, 3= high level) (Torres-Harding et al., 2012). RMAS and each of its domains are scored on an additive scale, with higher scores indicating more occurrences. A detailed description of the survey development and validation mechanism is discussed elsewhere (Torres-Harding et al., 2012).

Table 2: Racial Microaggression Scale Domains

Scale Domains	**Definition**	**Items**	**Sample Question**	**Cronbach Coefficient Alpha**
Invisibility	Not seen as a "real" person, being dismissed, or devalued, being treated as less than or of lower status	8	"I receive poorer treatment in restaurants and stores because of my race."	0.89
Criminality	Being treated as aggressive, dangerous, or a criminal	4	"People act like they are scared of	0.85

			me because of my race."	
Low-Achieving/ Undesirable culture	Being treated as one's racial background is interchangeable, incompetent, incapable, low achieving, dysfunctional; successes are a product of unfair entitlements and special treatment	9	"Others hint that I should work hard to prove that I am not like other people of my race."	0.87
Sexualization	Being subject to sexual stereotypes; being treated in an overly sexual manner	3	"Other people view me in an overly sexual way because of my race."	0.83
Foreigner/Not Belonging	Being made to feel as if one is not a "true" American; suggesting one does not belong because of one's racial background	3	"Other people ask me where I am from, suggesting that I don't belong."	0.78
Environmental Invalidations	Negative perceptions of one's race resulting from the lack of representation in certain occupational sectors or positions of power	5	"Others ask me to serve as a "spokesperson" for people in my racial group"	0.81

In addition to the RMAS, the study instrument captured individual stress using the Perceived Stress Scale-10 (PSS-10). The PSS originated by Cohen in 1983 is a 14-item scale that measures how stressful one's life is perceived (Cohen, Kamarck, & Mermelstein, 1983). In 1988, this 14-item scale was reduced to a 10-item scale and has since been the recommended scale for research purpose (Sheldon Cohen & Gail Williamson, 1988) The PSS-10 is a widely used and accepted measure of perceived stress; it has been validated in diverse populations and translated into multiple languages. Experiences and feelings of a life event or situation are rated on a 5-point frequency scale

with 0= never to 4= very often. Respondents are to rate their feelings about these situations in the past month. The full study instrument is presented in Appendix E.

Psychometric Analyses: Racial Microaggression Scale (RMAS)

To examine the validity and reliability of the Racial Microaggression scale, face validity and internal consistency were assessed. Face validity confirms if a questionnaire seems to be reasonable to measure the underlying construct. For instance, does the statement "I receive poorer treatment in restaurants and stores because of my race" suffice as an adequate measure of invisibility with limited explanation? The questionnaire was examined by the Healthy Start director, alongside a group of women who identify as Black and/or African American or have expertise in the discrimination literature to determine face validity. Internal consistency was measured using Cronbach's Coefficient alpha. A Cronbach's coefficient alpha of 0.70 and above was deemed acceptable.

Outcome Assessment

Study Aim 1. The primary outcomes of interest were preterm birth and small for gestational age. Preterm birth (PTB) is defined as the birth of an infant before 37 completed weeks of gestation. Small for gestational age (SGA) is defined as infants born below the 10^{th} percentile of birthweight, specified by gestational age. The following variables were used to calculate PTB and/or SGA: gestational age and infant birth weight. The Hadlock fetal growth equation [*fetal growth (g)= exp (0.578 + 0.332x GA-.00354 x GA^2), where GA is the gestational age in exact weeks*] (Hadlock, Harrist, & Martinez-Poyer, 1991) was used to calculate cut points to determine birth weights per gestational age. Reference cut-points were specified for the study population and derived from the

mean gestational weight (in grams) at 40 weeks and the standard deviation (Mikolajczyk et al., 2011). In this sample, the mean gestational weight at 40 weeks was 3249 grams with a standard deviation of 511.01 grams.

Study Aim 2. The primary outcome of interest was the perception of racial discrimination. Perceived racial discrimination was measured using the Racial Microaggression Scale (RMAS). Analytically, perceived racial discrimination was expressed as a summation of item values, with higher scores representing more occurrence and/or severity of discrimination. Additionally, racial discrimination was analyzed by each underlying theme measured in the scale: invisibility, foreign/not belonging, sexualization, criminality, environmental invalidations, low-achieving/undesirable.

Study Aim 3. The primary outcome of interest was adverse birth outcomes. An adverse birth outcome was a composite variable of PTB, SGA, and LBW. This was determined if a participant had one of the three experiences, PTB, SGA, or LBW. The following variables were used to calculate the outcome: gestational age, infant birth weight, and sex of the infant.

Exposure Assessment

Study Aim 1. The primary exposure of interest was nativity status. For this study, the variable "country of origin" was used to dichotomize participants into foreign-born or US-born. Foreign-born is a catch-all term for anyone born outside the United States, United States territories, and the District of Columbia.

Study Aim 2. The descriptive factors of interest included socioeconomic, behavioral, psychosocial, maternal health conditions, age of migration to the US, and length of residency in the US.

Study Aim 3. The primary exposure of interest was perceived racial discrimination. Perceived racial discrimination was measured using the Racial Microaggression Scale (RMAS) survey.

Study Covariates

Relevant covariates were identified via literature assessment. Covariates were selected that fulfilled at least one of the following criteria: (1) associated with PTB and SGA and (2) associated with nativity status. Table 3 represents the study covariates.

Table 3. Study Covariates

Variables	**Type of Variable**	**Definition**	**Categories**
Age	Continuous	Age at enrollment of Healthy Start	Years
Ethnicity	Categorical	Hispanic/Latina Origin	0= Not Hispanic/Latina 1= Hispanic/Latina
Income	Categorial	Annual household income	0= <$10,000 1= $10,000-$14,999 2= $15,000-$19,999 3= $20,000- $24,999 4= $25,000-$34,999 5= $35,000- $49,999 6= >$50,000
Education	Categorical	Highest education completed	0=Less than high school 1= High School/GED 2= Some College 3= College 4yrs or more 4= None/Other

Insurance	Categorical	Insurance type	0= No Insurance 1= Medicaid/Title XIX 2= Private Insurance 3= Other
Marital Status	Categorical	Current relationship status	0= Single 1=Married 2= Dating/Relationship 3= Divorced/Separated
Language	Dichotomous	Primary language spoken at home	0= Not English 1= English
Duration of Residency	Continuous/Categorical	Length of time in the US from migration to date of the survey (i.e., less than 5 years or 5 or more years)	0= Less than 5 years 1= 5 or more years
Age of migration	Continuous/Categorical	Age when the participant first migrated to the US (i.e., less than 18 years of age or 18 years of age and older	0= Less than 18 years 1= 18 years or older
Cigarette Smoking	Dichotomous	Smoking cigarettes during your pregnancy	0= No 1= Yes
Alcohol	Dichotomous	Consume alcoholic beverages during pregnancy	0= No 1= Yes
Drug Use	Dichotomous	Drug use during pregnancy	0= No 1= Yes
Parity	Ordinal or Dichotomous	The number of pregnancies that resulted from live or still birth.	0 = Primigravida 1= Nulliparous (2-4) 2= Grand parous (5-8)

Prenatal Care	Dichotomous	Prenatal care received during pregnancy	0= No 1= Yes
Depression	Continuous/Categorical	Depression based on the Edinburgh Postnatal Depression Score, with depression defined as score greater than 12	0= EPDS score > 12 1= EPDS score =<12
Hypertension	Dichotomous	Medically diagnosed with hypertension diseases that developed prior to or during pregnancy	0= No 1= Yes
Gestational Diabetes	Dichotomous	Medically diagnosed diabetes resulting from pregnancy	0= No 1= Yes
Admission status	Dichotomous	Status of pregnancy when client started the program	0= Postpartum at Admission 1= Pregnant at Admission

Data Analysis

Study Aim 1. Descriptive and inferential statistics were used to analyze the data and to provide a systematic description of the study participants and variables. Demographic and other covariates were compared among foreign-born and US-born Black women. Chi-square, Fisher exact, and independent t-tests were used to determine significant differences in demographic, socioeconomic, behavioral, and maternal health

condition variables, stratified by maternal nativity status. Univariate and multivariable logistic regression models, odds ratios, and 95% confidence intervals were used to examine the relationship between maternal nativity status and preterm birth and small for gestational age. Covariates were conceptualized as potential meditators in the association between nativity status and PTB/SGA based on the study's conceptual model (Figure 1). Thus, to examine their effect on the association of nativity status on PTB/SGA, bivariate models were used to examine the change in the beta estimate (ß1) of nativity when a covariate was present in the model. If the change in B1 was greater than 10%, the variable remained in the fully adjusted model. The covariates examined in the bivariate models were significant in the Chi-square analysis, excluding maternal age. To further explore mediation, we used logistic regression models, odds ratios, and 95% confidence intervals to explore the direct and indirect effect of depression on the relationship between nativity and PTB.

Study Aim 2. Descriptive statistics were used to provide a description of the study population and examine differences in reporting of perceived racial discrimination among Black mothers. Because the perceived racial discrimination score was not normally distributed, median and IQR were utilized to summarize the findings for each scale.

Study Aim 3. A univariate logistic regression model, odds ratio, and 95% confidence interval were used to determine the crude association between perceived racial discrimination and adverse birth outcomes. A series of Wilcoxon rank-sum tests were used to examine the differences in perceived racial discrimination between foreign-born Black women based on the duration of residency in the US and the age of migration.

A p-value less than the set alpha level of .05 was used to determine statistical significance. All analyses were conducted using Statistical Analysis Software (SAS) version 9.4.

V. RESULTS

Description of Study Population

The secondary analysis consisted of 1233 Black women who participated in the Des Moines Healthy Start/Empowerment initiative and met the inclusion criteria from 2000 to 2021. Among the women in the study, 904 (73.32%) were US-born and 329 (26.68%) were foreign-born. The bulk of foreign-born women were from countries in Sub-Saharan Africa (98.20%), with the Republic of Congo (27.50%), Sudan (16.25%), Democratic Republic of Congo (13.33%), and Liberia (11.25%) emerging as the top four countries of origin. The majority of women in the sample (83.29%) were between 18 and 35 years, with a maternal age range from 13 to 59 years. Those less than 18 years were excluded from the analysis. The average maternal age was 27.74 years, with foreign-born women having an average age slightly higher (29.78 years) in comparison to US-born Black women (26.98 years). A higher proportion of foreign-born Black women were of Hispanic/Latina descent (2.74% vs. < 1.00%, respectively).

Nearly half of the women had less than a high school education (47.20%). A little more than 20% of all women attained some college or higher education, with a significantly higher proportion of US-born Black women receiving some college credit compared to foreign-born Black women (22.57% US-born vs. 17.20% FB, $p < .0001$). Regarding income, 50% of the study population was identified as making less than $10,000 a year

with a higher proportion observed among US-born Black mothers compared to foreign-born Black mothers (54.87% US-born vs 33.43% FB, $p < .0001$).

US-born Black mothers were less likely to be married in contrast to foreign-born Black women (28.43% US-born vs. 58.05% FB, $p <.0001$). In addition, Medicaid/ Title XIX (73.7% US-born vs 72.04% FB) coverage was the primary insurance type among the study sample. Approximately 50% of Black women identified English as their primary language. Among those, a significantly higher proportion of English speaking was observed among US-born Black women (63.05% US-born vs 14.85% FB, $p < 0.0001$).

US-born Black women were less likely to receive prenatal care (46.90% US-born vs 60.49% FB, $p < 0.0001$), yet more likely to engage in risky behaviors including tobacco use (19.36% US-born vs <1.00% FB, $p < 0.0001$) alcohol use (11.06% US-born vs <1.00% FB, $p < 0.0001$) and drug use (3.10% US-born vs <1.00% FB, $p= 0.0121$). US-born Black women presented with approximately the same rate of gestational diabetes (1.33%US-born vs <1.00% FB, $p = 0.7709$) and slightly higher rates of hypertension (7.30% US-born vs 4.56% FB, $p = 0.0857$) compared to foreign-born women, although the overall proportions of both (1.22% gestational diabetes and 6.57% hypertension) were low in the study population. US-born Black women were less likely to be multiparous compared to foreign-born Black women (p-value <0.0001). Lastly, there was a significant difference in mild prenatal depression defined by an EPDS score of 12 or higher with foreign-born Black women less likely to experience prenatal depression (79.03% US-born vs 20.58% FB). Table 4 provides a description of the socioeconomic, behavioral, and maternal health conditions among US-born and foreign-born Black women.

Table 4: Descriptive Table by Nativity Status

Variable	US Born (N= 904)	Foreign Born (N=329)	P-Value
Maternal Age (Mean± SD)	26.99 ±6.38	29.78 ±6.46	0.7616
Ethnicity n (%)			0.0180[a]
Non-Hispanic	897 (99.23)	320 (97.26)	
Hispanic	7 (<1.00)	9 (2.74)	
Education n (%)			<0.0001[b]
Less than High School	393 (43.47)	189 (57.45)	
High School/ GED	307 (33.96)	84 (25.53)	
Some College	144 (15.93)	26 (7.90)	
College 4yrs or more	28 (3.10)	21 (6.38)	
None/Other	32 (3.54)	9 (2.74)	
Income n (%)			<0.0001[b]
<$10,000	496 (54.87)	110 (33.43)	
$10,000-$14,999	139 (15.38)	19 (5.78)	
$15,000-$19,999	113 (12.50)	25 (7.60)	
$20,000-$24,999	64 (7.08)	37 (11.25)	
$25,000-$34,999	51 (5.64)	87 (26.44)	
$35,000-$49,999	15 (1.66)	37 (11.25)	
>$50,000	4 (<1.00)	11 (3.34)	
Missing	22 (2.43)	3 (<1.00)	
Marital Status n (%)			<0.0001[b]
Single	446 (49.34)	86 (26.14)	
Married	257 (28.43)	191 (58.05)	
Dating/Relationship	105 (11.62)	32 (9.73)	
Divorced/Separated	82 (9.07)	20 (6.08)	
Missing	14 (1.55)	n/a	
Insurance n (%)			0.0136[b]
No Insurance	88 (9.73)	39 (11.85)	
Medicaid/Title XIX	666 (73.67)	237 (72.04)	
Private Insurance	95 (10.51)	31 (9.42)	
Other	55 (6.08)	18 (5.47)	
Missing	n/a	4 (1.22)	
Primary Language Spoken			<0.0001[b]
English	570 (63.05)	49 (14.89)	
Not English	334(36.95)	280 (85.11)	
Prenatal Care			<0.0001[b]

No PNC Received	480 (53.10)	130 (39.51)	
PNC Received	424 (46.90)	199 (60.49)	
Drugs Use n (%)			0.0121[b]
No	876 (96.90)	327 (99.39)	
Yes	28 (3.10)	2 (<1.00)	
Tobacco Use n (%)			<0.0001[b]
No	729 (80.64)	326 (99.09)	
Yes	175 (19.36)	3 (<1.00)	
Alcohol Use n (%)			<0.0001[b]
No	804 (88.94)	326 (99.09)	
Yes	100 (11.06)	3 (<1.00)	
Gestational Diabetes n (%)			0.7709[a]
No	892 (98.67)	326 (99.09)	
Yes	12 (1.33)	3 (<1.00)	
Hypertension n (%)			0.0857[b]
No	838 (92.70)	314 (95.44)	
Yes	66 (7.30)	15 (4.56)	
Parity n (%)			<0.0001[b]
Primigravida	99 (10.95)	18 (5.47)	
Nulliparous (2-4)	464 (51.33)	192 (58.36)	
Grand parous (5-8)	287 (31.75)	116 (35.26)	
Missing	54 (5.97)	3 (< 1.00)	
EPDS Score n (%)			<0.0001[b]
No Prenatal Depression	186 (20.58)	260 (79.03)	
Prenatal Depression	49 (5.42)	17 (5.17)	
Missing	669 (74.00)	52 (15.81)	
Healthy Start Admission Status n (%)			0.2207[b]
Postpartum at admission	478 (52.88)	161 (48.84)	
Pregnant at Admission	426 (47.12)	168 (51.06)	

[a]Fisher Exact Test, [b]Chi square Test, P-value < 0.05 =significant, n/a= not applicable

Study Aim 1: SGA and PTB among US-born and Foreign-born Black Women

In the sample, the prevalence of PTB and SGA were 16.46% and 9.57%, respectively. US-born Black women were more likely to have preterm infants compared to foreign-born Black women (18.14% US-born vs 11.85% FB, $p < 0.0085$). Similarly, the prevalence of SGA was higher among US-born Black women compared to foreign-born Black women (10.73% US-born vs. 7.90% FB, p=0.32), yet no significant difference was observed by nativity status. In addition, LBW in the population was 13.5%, with a higher proportion attributed to US-born Black women (15.15% US-born vs 8.81% FB p=0.0039) (Table 5).

Table 5: Birth Outcomes by Nativity

Variable	US Born (N= 904)	Foreign-Born (N= 329)	P-value
Preterm Birth n (%)	164 (18.14)	39 (11.85)	0.0085[a]
Extremely Preterm	18 (1.99)	6 (1.82)	
Very Preterm	11 (1.22)	1 (<1.00)	
Moderate Preterm	135 (14.93)	32 (26.68)	
Birthweight n (%)			0.0039[a]
≥2500g	767 (84.84)	300 (91.19)	
<2500g	137 (15.15)	29 (8.81)	
SGA n (%)	97 (10.73)	26 (7.90)	0.3202[a]
Missing	11 (1.22)	5 (1.52)	

[a]*Chi-square test*

Regression Models

In the unadjusted logistic regression model, US-born Black women presented significantly higher odds of having a preterm infant compared to foreign-born Black women (cOR: 1.65; 95% CI: 1.13-2.40) (Table 6, Model 1). In addition, US-born Black mothers had higher odds of SGA compared to foreign-born Black women; however, this association was not statistically significant (cOR: 1.47; 95% CI: 0.92-2.35). Model 2 represents the adjusted logistic regression model. Covariates included in the model illustrated a 10 percent change (PC) in the beta estimate of nativity (Table 7) when compared to a model including nativity only. The fully adjusted model did not include primary language because of its high correlation to nativity status. Thus, the fully adjusted model included education, income, marital status, maternal age, tobacco use, alcohol use, and prenatal care. In the fully adjusted model, US-born Black women had 21% increased odds of PTB compared to foreign-born Black women; however, this association was not statistically significant (aOR: 1.21; 95% CI: 0.79-1.85). Likewise, while US-born Black women had 11% increased odds of SGA compared to foreign-born Black women, this association was not statistically significant (aOR: 1.11; 95% CI: 0.66-1.90).

Table 6: Association between Nativity Status and PTB and SGA: Logistic Regression Models

		Model 1 cOR (95% CI)	**Model 2*** aOR (95% CI)
PTB	US-Born	1.65 (1.13-2.40)	1.21 (0.79-1.85)
	Foreign-Born	Reference	- - -
SGA	US-Born	1.47 (.92- 2.35)	1.11 (0.66-1.90)

Foreign-Born	Reference	-	-

*Adjusted for education, income, marital status, maternal age, tobacco use, alcohol use, prenatal care cOR= Crude Odds Ratio, aOR= Adjusted Odds Ratio

Title 7: Change in Beta Estimate of Nativity in Bivariate Logistic Regression Model

Variables	β_1	**Percent change (%)**
Nativity (crude)	*0.50 (OR:1.65 CI:1.13-2.40)*	
Ethnicity	*0.52*	*3.52*
Education*	*0.43*	*13.49*
Income*	*0.34*	*32.35*
Insurance	*0.50*	*<1.00*
Marital Status*	*0.25*	*49.97*
Primary Language	*-0.03*	*93.47*
Parity	*0.51*	*1.14*
Maternal Age*	*0.55*	*11.03*
Tobacco Use*	*0.41*	*17.62*
Drug Use	*0.48*	*3.12*
Alcohol Use*	*0.44*	*11.43*
Prenatal Care*	*0.42*	*15.90*
EPDS (Depression)	*0.54*	*7.27*
Final Model*	*0.19 (OR: 1.21, CI: .79-1.85)*	*62.44*

**Represents variables in the final adjusted model*

The specified covariates analyzed in the bivariate models presented a significant difference by nativity status in Table 4 excluding maternal age. Based on the crude beta estimate of nativity (β_1: 0.50); all covariates except ethnicity (β_1: 0.52, PC: 3.52%),

insurance (β_1: 0.50 PC <1.00%), parity (β_1: 0.51, PC:1.14%), drug use (β_1: 0.48, PC:3.12%), and depression (β_1:0.54, PC: 7.27%) presented more than a 10% change in beta estimate.

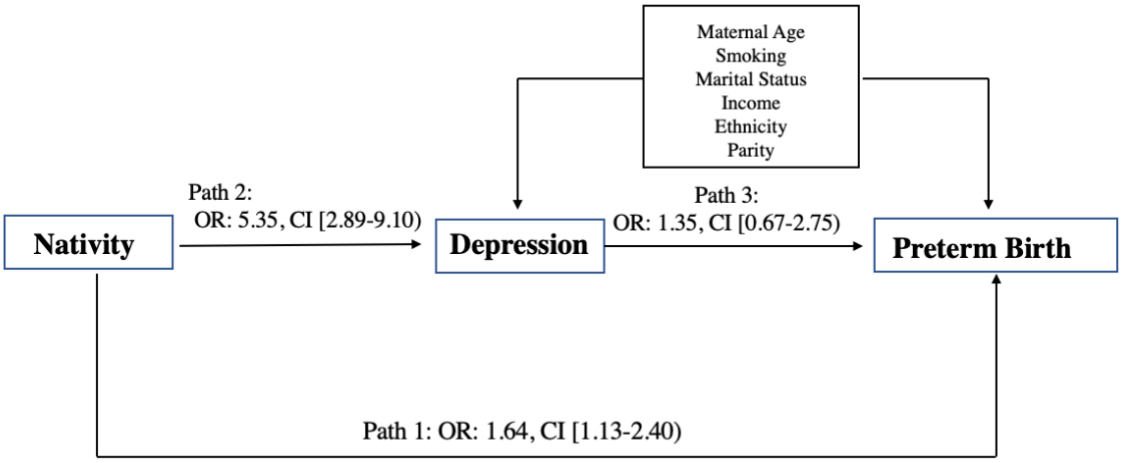
Exploration of Mediation

To further explore the influence of covariates, a supplement analytic analysis explored depression as a mediator in the relationship between nativity status and PTB, specifically. Depression was utilized as a proxy for psychosocial stress. Figure 1 shows a directed acyclic graph (DAG) between nativity and PTB. In this figure, depression is depicted as an intermediate step (i.e., mediator) in the causal pathway. The logistic regression models were used to determine how much of the association between nativity status and PTB operated by way of depression. To determine this; (1) we identified the crude association between nativity and PTB, (2) determined if an association existed between nativity and depression (i.e., exposure -meditation path), and (3) determined if an association existed between depression and PTB (meditation -outcome path) while controlling for confounders.

Being born in the US was significantly associated with increased odds of PTB (OR: 1.65, 95% CI: 1.13-2.40) among Black women. Additionally, being born in the US was significantly associated with depression (OR: 5.35, 95% CI: 2.82-10.14) among Black women. Lastly, the crude association between depression and PTB was significant (not illustrated), yet after adjustment for known confounders, the relationship between depression and PTB was not significant (OR: 1.35 95% CI 0.67-2.75). Because path 3 was not significant (i.e., assumption 2: control for meditation-outcome confounding) a

formal meditation analysis to determine the direct and indirect effect of depression was not conducted.

Figure 1. Directed Acyclic Graphic of Nativity Status and Preterm Birth



Study Aim 2: Reporting of Racial Discrimination

Thirty-one mothers of singleton live births, who self-identified as Black or African American and participated in the Des Moines, Health Start/ Empowerment Initiative completed the study survey. Among the women, four (12.90%) were US-born Black women and 27 (87.10%) were foreign-born Black women. All the foreign-born Black women were from countries in Sub-Saharan Africa including the Democratic Republic of the Congo, Eritrea, Tanzania, Congo, Kenya, Liberia, and Somalia. Table 8 provides a description of the socioeconomic, behavioral, and maternal health conditions. Three participants were missing socio-demographic information reducing the sample to 29. In general, most of the sample consisted of foreign-born Black women. Most of the sample had less than a high school education and reported a household income of less than $35,000. A little less than half of the participants were married, and over a third of the participants used Medicaid as their insurance provider. Also, minimum to no alcohol,

tobacco, or drug use was reported. In addition, no one in the sample had gestational diabetes, and one reported having hypertension. The sample presented minimum mild depression measured by the EPDS, yet US-born Black women had a higher medium score of perceived stress in comparison to foreign-born Black women.

Title 8: Descriptive Table of Survey Participants

Variable	**N= 29**
Maternal Age median (Q1-Q3)	27.00 (24-33)
Nativity n (%)	
US-born	3 (10.34)
Foreign-born	26 (89.66)
Ethnicity n (%)	29 (100%)
Non-Hispanic	
Education n (%)	
Less than High School	14 (48.28)
High School/ GED	9 (31.03)
Some College	5 (17.24)
College 4yrs or more	0
None/Other	1 (3.45)
Income n (%)	
<$10,000	11 (37.93)
$15,000-$19,999	1 (3.45)
$20,000-$24,999	2 (6.90)
$25,000-$34,999	11 (37.93)
$35,000-$49,999	4 (13.79)
Marital Status n (%)	
Single	7 (24.14)
Married	13 (44.83)
Dating/Relationship	6 (20.69)
Divorced/Separated	3 (10.34)
Insurance n (%)	
No Insurance	4 (13.79)
Medicaid/Title XIX	23 (79.31)
Private Insurance	1 (3.45)
Other	1 (3.45)

Primary Language Spoken	
English	11(37.93)
Not English	18 (62.07)
Prenatal Care	
No PNC Received	10 (34.48)
PNC Received	19 (65.52)
Tobacco Use n (%)	
No	29.00 (100)
Yes	0
Alcohol Use n (%)	
No	27 (93.10)
Yes	2 (6.90)
Drug Use n (%)	
No	29 (100)
Yes	0
Hypertension n (%)	
No	28 (96.55)
Yes	1 (3.45)
Gestational Diabetes n (%)	
No	29 (100)
Yes	0
Parity n (%)	
Primigravida	3 (10.34)
Nulliparous (2-4)	16 (55.17)
Grand parous (5-8)	10 (34.48)
EPDS Score n (%)	
No Prenatal Depression	27 (93.10)
Prenatal Depression	2 (6.90)
Perceived Stress median (Q1, Q3)	12 (4,16)
Foreign-Born median (Q1, Q3)	9 (4,16)
US-born median (Q1, Q3)	20 (13.5-23.5)

The Racial Microaggressions Scale (RMAS) displayed high to moderate internal consistency measured by Cronbach Coefficient Alpha among this study population. Table 9 provides the Cronbach Coefficient Alpha statistic for each sub-scale of RMAS.

Table 9: Internal Consistency of RMAS

Scale	Items	Cronbach Coefficient Alpha
Invisibility	8	0.93
Criminality	4	0.97
Low Achieving/ Undesirable culture	9	0.93
Sexualization	3	0.87
Foreigner/Not Belonging	3	0.82
Environmental Invalidations	5	0.75
RMAS	32	0.96

Among the 31 Black women, the median RMAS score was 7 with an interquartile range (IQR) of 25. US-born Black women had a higher median RMAS score in comparison to foreign-born Black women (median= 40 US-born vs. 7 FB) (Table 10). Regarding foreign-born Black women, those who migrated to the US before age 18 had a higher median RMAS score (median= 28) than those who migrated to the US after age 18 (median= 6). Likewise, those who have lived in the US for five years or more had a higher median RMAS (median= 9) compared to those who have lived in the US for less than five years (median score= 5) (Table 11). Additionally, US-born Black women reported higher median scores on Invisibility, Criminality, Low achieving/undesirable culture, Sexualization, and Environmental Invalidations (Table 10).

Table 10: Reporting of Median Racial Microaggression Scores by Nativity Status

Scale*	**Total Study Sample** N=31	**US-born** N=4	**Foreign-Born** N=27
Invisibility Score Range (0-24)	0, 2 (0-2)	10, 20 (0-20)	0, 2 (0-2)
Criminality Score Range (0-12)	0, 3 (0-3)	5, 11 (0-11)	0, 0 (0-0)
Low Achieving/ Undesirable culture Range (0-27)	2, 10 (0-10)	14, 22.5 (2.5-25)	1, 8 (0-8)
Sexualization Score range (0-9)	0, 1 (0-1)	2.5, 6 (0-6)	0, 0 (0-0)
Foreigner/Not Belonging Score Range (0-9)	2, 6 (0-6)	2, 3 (1-4)	2, 6 (0-6)
Environmental Invalidations Score Range (0-15)	2, 5 (0-5)	5, 9.5 (0.5-10)	2, 4 (0-4)
RMAS Score Range (0-96)	7, 25 (3-28)	40, 70 (5-75)	7, 16 (3-19)

**Reporting of Median, IQR (Q1-Q3)*

Table 11: Differences in Median Racial Microaggression Scores by Duration of Residency and Age of Migration in the US among Foreign-born Black women

Scale*	**US < 5** N=14	**US ≥ 5** N=13	**Age of M <18** N=7	**Age of M ≥ 18** N=19
Invisibility Score Range (0-24)	0, 0 (0-0)	2, 2 (1-3)	2, 5 (0-5)	0,1 (0-1)
Criminality Score Range (0-12)	0, 0 (0-0)	0, 0 (0-0)	0, 3 (0-3)	0, 0 (0-0)

Low Achieving/ Undesirable culture Range (0-27)	1, 7 (0-7)	1, 13 (0-13)	10, 14 (0-14)	1,7 (0-7)
Sexualization Score range (0-9)	0, 0 (0-0)	0, 2 (0-2)	1, 4 (0-4)	0, 0 (0-0)
Foreigner/Not Belonging Score Range (0-9)	1, 4 (0-4)	3, 6 (1-7)	3, 7 (0-7)	2, 5 (0-5)
Environmental Invalidations Score Range (0-15)	1.5, 3 (0-3)	3, 5 (0-5)	4, 5 (0-5)	2, 4 (0-4)
RMAS Score Range (0-96)	5, 12 (2-14)	9, 26 (6-32)	28, 32 (1-33)	6,11 (3-14)

**Reporting of Median, IQR (Q1-Q3); US < 5r= Lived in the US for less than 5 years at the time of the study; US ≥5= Lived in the US for 5 or more years at the time of the study; Age of M <18= Migrated to the US before the age of 18 years; Age of M ≥18= Migrated to the US at 18 years or older*

Study Aim 3a: Perceived Racial Discrimination and Adverse Birth Outcome.

An adverse birth outcome was defined as experiencing PTB, SGA, or LBW. In the sample, the prevalence of an adverse birth outcome was 16.67% (Table 12). Among foreign-born mothers, higher racial discrimination mean scores were observed among mothers who experienced an adverse birth outcome in comparison to those who did not experience an adverse birth outcome, yet the results were not significant (p =0.5605). Similarly, though the odds of having adverse birth outcomes increased by 3.0% for every 1-unit increase on the racial discrimination scale, no significant difference was observed; therefore, in this sample, perceived racial discrimination was not significantly associated with adverse birth outcome (cOR: 1.03, 95% CI 0.96, 1.10).

Table 12: Prevalence of Adverse Birth Outcomes among Foreign-born Black Women

Birth Outcome	**Prevalence, n (%)** **N=24**
Preterm Birth	2 (8.33%)
Small for Gestational Age	2 (8.33%)
LBW	3 (12.54%)
Adverse Birth Outcomes	4 (16.67%)

Study Aim 3b: Length of Residency, Age of Migration, and Perceived Racial Discrimination

There was no significant difference in perceived racial discrimination and length of residency in the US (p= 0.10) nor the age of migration (p= 0.53) among foreign-born Black women. Even so, foreign-born Black women who resided in the US for five or more years had higher mean perceived racial discrimination scores (mean score =15.10) in comparison to foreign-born Black women who resided in the US for less than 5 years (mean score= 10.30). Likewise, higher mean racial discrimination scores were observed among mothers who migrated to the US before 18 years of age (mean score = 13. 58) compared to mothers who migrated to the US after age 18 (mean score= 11.44) (Table 13). Also, in a supplement analysis, a higher proportion of adverse birth outcomes were experienced among foreign-born mothers whose duration in the US was 5 years or more, or if they migrated before age 18, yet these results were not statistically significant.

Table 13: Wilcoxon Mean Scores for Perceived Racial Discrimination by Duration of Residency and Age of Migration in the US

Variable	**Sample**	**Mean Score**	**P-value**
Duration of Residency (in years)			0.10
US < 5	13	10.30	

US ≥ 5	11	15.09	
Age of Migration (in years)			0.53
< 18	6	13.58	
≥ 18	17	11.44	

VI. DISCUSSION

Our results indicate that among Black women who participated in Des Moines, Iowa Healthy Start between 2000 to 2021, US-born Black women had significantly higher odds of PTB compared to foreign-born Black women. In addition, US-born Black women presented higher odds of SGA in comparison to foreign-born Black women, yet this was not significant. After adjustment for well-known risk factors, US-born Black women still presented higher odds of PTB and SGA, yet the effect attenuated, and a significant difference was not observed between the two groups. The results of our study mimic those of Cabral and colleagues (1990) study among 817 Boston women. They found that after adjusting for covariates (e.g., education, PNC, marital status, maternal age, tobacco use, alcohol use, drug use, etc.), the foreign-born advantage persisted yet the difference between the groups was no longer statistically significant (Cabral et al., 1990). One reason for the null association may be due to the socioeconomic background of the study population. A recent study suggested that differences in birth outcomes are commonly not observed among highly disadvantaged groups (Braveman et al., 2015). For example, Braverman and colleagues (2015) analyzed the role of socioeconomic factors (i.e., income and education) in the Black-white disparity of PTB and found among the most disadvantaged group no significant difference was observed (Braveman et al., 2015). In other words, mothers of the most socioeconomic disadvantaged group reflected an equal risk of adverse birth outcomes regardless of race. This suggests that lower

socioeconomic status may undermine other social characteristics that serve as protective factors. Among our study sample of Healthy Start Black women, many had no college education, an income of less than $12,000, and were recipients of government-based insurance, irrespective of nativity status. Thus, the lack of statistical differences observed among foreign-born and US-born Black women's odds of PTB and SGA in the fully adjusted model may be reflective of the disadvantaged socioeconomic status of the study population.

Nonetheless, despite the lack of statistical significance, our findings are suggestive that nativity status is associated with PTB and SGA, with a continued disadvantage observed among US-born Black women in comparison to foreign-born Black women. Our findings are comparable to previous studies. For example, Elo and colleagues (2014) examined vital records for 27 states and discovered foreign-born Black women had lower odds of PTB and SGA compared to US-Born Black women (Elo et al., 2014). Among Black mothers who gave birth in California from 2011 to 2017, in the unadjusted model, US-born Black women were 62% (OR: 1.62, 95% CI 1.52-1.72) and 57% (OR: 1.57, 95% CI 1.49-1.65) more likely of having an infant that was preterm and small for gestational age, respectively (Mckenzie-Sampson et al., 2021). Our study observed similar effect estimates. Furthermore, after adjustment, US-born Black women continued to have an elevated risk of PTB and SGA (PTB aRR: 1.51, 95% CI 1.39-1.65; SGA aRR: 1.52, 95% CI 1.41-1.64) (Mckenzie-Sampson et al., 2021). The results of our study mirror this relationship excluding the decline in the effect estimate and significance in our study's adjusted model. The fully adjusted model in the Mckenzie-Sampson study included maternal age, maternal education, parity, health insurance, Women's Infant and

Child program participants, PNC, BMI, smoking/drug use, diabetes, and hypertension (Mckenzie-Sampson et al., 2021). While our final adjusted model included maternal education, income, marital status, maternal age, tobacco and alcohol use, and PNC. Though similar, the differences in the models could explain why after adjustment, the effect attenuated. In our study, marital status and income had the greatest effect on nativity (refer to Table 3). These variables accounted for roughly 50% and 34% change in nativity in the bivariate models. In our study marital status and income may overshadow the effect of the nativity on PTB and SGA thus explaining why the odds of PTB and SGA declined among US-born Black women and a significant difference was not observed. Additionally, to further understand the role of study covariates, meditation analysis was explored. In the study, depression was explored as a potential mediator in the relationship between nativity status and PTB. Conceptually depression was an ideal variable to assess mediation because it was the only captured stress variable in the Healthy Start database that could cause a biological stress response, and depression is a variable in which intervention efforts can be created. Though our study findings did not conduct a full mediation analysis because all assumptions were not met, our observations suggest that depression alongside many of the study covariates may be in the causal pathway between nativity and PTB, and thus more research should explore these variables as meditators.

Our results also indicate that US-born Black women perceive more experiences of racial discrimination than their foreign-born counterparts. Previous studies have hypothesized exposure to racial discrimination throughout the lifespan may contribute to the differences in birth outcomes among US-born and foreign-born Black women (T. P. Dominguez et al., 2009; Krieger et al., 2011). In 2011, self-reports of racial

discrimination measured by the Experiences of Discrimination scale highlighted that among a Boston cohort of working-class employees, US-born Black participants reported higher racial discrimination levels than foreign-born Black workers (Krieger et al., 2011). Likewise, Dominguez and colleagues (2014) assert that the difference in self-reporting of racial discrimination is a distinguishing factor between foreign-born and US-Born Black pregnant women, specifically (Tyan Parker Dominguez, Emily Ficklin Strong, Nancy Krieger, Matthew W. Gillman, & Janet W. Rich-Edwards, 2009). US-born Black women were twice as likely to report personal experiences of racism and three times as likely to report that their group in general experienced racial discrimination in comparison to foreign-born Black women (T. P. Dominguez et al., 2009). Although the exact biologic pathways remain unclear, racial discrimination has been identified as a chronic stressor and has been associated with higher allostasis (Leimert & Olson, 2020) and weathering among US-born Black women (A. Geronimus et al., 2006), aiding in their disproportionate burden of adverse birth outcomes. Stress throughout the life course and pregnancy is suggested to cause dysregulation of biological systems and pathways that can potentially disrupt critical pathways associated with parturition (Leimert & Olson, 2020).

Unsurprisingly, US-born Black women also reported higher exposure to domain-specific experiences of racial discrimination on the RMAS. One of particular interest to the conceptualization of this dissertation study was the domain of sexualization. Historically, US-born Black women's sexuality has been under constant scrutiny from being labeled as promiscuous to perceived as unfit mothers (Rosenthal & Lobel, 2011). These stereotypes and their acceptance among US-born Black women can create a unique

source of stress throughout life and even more so during pregnancy (Rosenthal & Lobel, 2011). The concept of intersectionality has promoted the importance of studying how one's multiple identities intersect and impact one's health. To that end, our findings align with previous literature on the differential reporting of racial discrimination among foreign-born and US-born Black women and promote the exploration of more novel aspects of racism such as gendered racism and its potential impact on Black women's birthing outcomes.

Moreover, the findings of this study are consistent with existing literature in that reporting among foreign-born Black women differentiated based on length of residence and age of migration (Tyan Parker Dominguez et al., 2009; Elsayed et al., 2019; Krieger et al., 2011). Our study showcases that foreign-born women who have resided in the US for more than five years or migrated to the US prior to 18 years of age, perceived more experiences of racial discrimination. In addition, our study found that among foreign-born women, the odds of having an adverse birth outcome increased for each additional experience of racial discrimination, but the sample size was small, and no statistically significant differences were observed. Also, we found that among foreign-born women, a higher proportion of those who experienced an adverse birth outcome was among those who resided in the US for more than five years and migrated to the US before the age of 18. Eslayed and colleagues (2019), discovered a similar trend among foreign-born Black women and how duration in the US influences infant health outcomes. Their findings suggest that the foreign-born advantage significantly diminishes within a decade of residing in the US, but a decline in infant health can be observed as early as two-year post-migration (Elsayed et al., 2019). Research has established that the longer foreign-

born Black women reside in the US the protective effect of being foreign-born tapers, and their birth outcomes resemble that of US-born Black women within several years (Andrasfay & Goldman, 2020; Collins et al., 2002). One theory is that foreign-born Black women are being exposed to more racial discrimination, thus subjected to psychological distress that can be physiologically harmful over time (Andrasfay & Goldman, 2020). Andrassy and colleagues (2020) found that foreign -born Black women perinatal advantage diminishes faster than foreign -born white or Hispanic women and occurs as quickly as one generation even when controlling for socioeconomic factors. They postulate that exposure to racial discrimination, explicitly interpersonal experiences, are a contributing factor to the deprecation of foreign -born Black women perinatal health outcomes (Andrasfay & Goldman, 2020).

Study Strengths

There are several strengths of this study. The study used the Racial Microaggression Scale to explore experiences of racial discrimination. To our knowledge, this is the first study to use this scale to explore the relationship between racial discrimination and adverse birth outcomes. In addition, this scale captures multiple domains in which racial discrimination may operate. Furthermore, utilizing a cross-sectional design was deemed an efficient method for exploring this research question and allowed comparison with other cross-sectional studies. Another strength of the study is the study site of the population. Limited literature has utilized Healthy Start data to explore disparities in infant health outcomes. As a federally funded initiative targeted at reducing infant mortality, women who participate in Healthy Start serve as a source population to explore and intervene in many maternal and child health outcomes.

Furthermore, the findings of our study can be used to specifically assist in the development of evidence-based community-level interventions among participants of the Des Moines, Iowa Healthy Start Initiative.

Study Limitations

This study has limitations that should be taken into consideration when interpreting the results. First, the sample size for the primary data was small; therefore, we did not have enough power to detect differences between the groups, nor the ability to reject the null hypothesis. Yet, among the sample, our findings showed similar trends as previous literature. The use of a cross-sectional study design limits our ability to assess causation as temporality cannot be determined. However, the use of this study design aligns with existing literature on this topic allowing for comparison of study findings. Albeit the secondary data was missing genetic and environmental risk factors associated with adverse birth outcomes, this study highlighted factors associated mainly with social determinants of health, highlighting the importance of social conditions influencing one's health outcomes. The use of Healthy Start secondary data could be subject to misclassification bias; all data collected was self-reported, which may have introduced recall and reporting bias, specifically social desirability bias as it relates to the reporting of risky health behaviors. Also, recruitment tactics may have introduced selection bias as case managers were charged to identify eligible participants. Due to the nature of the study, those whose language was not English may have been less likely to participate, though all participants were provided interpreter services by request. Lastly, the results of our study are not generalizable to all US-born Black women and foreign-born Black women who reside in the US. We acknowledge those represented in the study were

participants of a federally funded initiative aimed to support the improvement of maternal and child health outcomes. Also, these women cannot account for the geographical differences between foreign-born and US-born Black women.

Study Implications

The findings of this study confirm the need for continued research to better understand how nativity is operating as a protective factor among foreign-born Black women who live in the United States. As foreign-born Black women are afforded this perinatal advantage upon arrival to the US, exploring if this advantage is in part due to concepts such as the Healthy Immigrant effect, which is heavily illustrated by other ethnic groups, or other reasons. Specifically understanding how acculturation may differ among foreign-Born Black women in comparison to other ethnic groups is critical in part to the historical and continued marginalization of Black populations in the US. To that end, future research needs to explore understudied concepts such as migrant selectivity, cultural buffering, and ethnic enclaves specifically among foreign-born Black women. The findings also suggest a continued need for culturally specific interventions that target individual factors associated with adverse birth outcomes. Based on this study, the Black women participating in Des Moines Healthy Start are socioeconomically disadvantaged, thus, a grave need for interventions that target issues surrounding education, access to quality prenatal care, and accessibility to health care should continue and be curated to address the unique experiences of Black women. Also, the findings of the study highlight the need for continued research on the role of racial discrimination and its impact on foreign-born and US-born Black women's perinatal health outcomes. Specifically, future research should explore the lived experiences of foreign-born women in the US and their

perceptions of racial discrimination to gain a more comprehensive understanding beyond quantitative measures. This may provide insight into how racism is viewed, perceived, and addressed among populations who are not inherent to its pervasiveness. Lastly, this study provides insight for the expansion of Des Moines Healthy Start assessment tools to include social and structural determinants that influence health outcomes including domains related to racial discrimination and acculturation.

Future Recommendations

Based on the results of this study, next steps would be to further investigate perceptions of racial discrimination among foreign-born and US-born Black women. This should include a qualitative exploration of racism, including internalized, interpersonal, and institutional domains, among foreign-born and US-born Black women to gain a more comprehensive understanding. In addition, since an estimate of effect could not be determined between racial discrimination and adverse birth outcomes among foreign-born Healthy Start Clientele; we recommend conducting a follow-up study with a larger sample size to account for the prevalence of adverse birth outcomes and have enough power to detect an association between exposure and outcome. In addition, the next steps would be to investigate how socioeconomic factors influence the relationship between nativity and adverse birth outcomes. Specifically, an exploration of meditation should be conducted to potentially assess causal pathways.

Conclusion and Public Health Significance

This study was of public health significance because US-born Black women are disproportionately burdened by negative perinatal outcomes in comparison to other racial and ethnic groups, including their foreign-born counterparts. The disparity has persisted

for several years, yet no known risk factors have fully explained the difference. Over the last twenty years, more research has sought to explore social factors as a contributor to this disparity. One socially constructed factor of investigation is racism. Since the insurrection of the US, racism has been a critical factor in Black health. Uniquely, experiences of racial discrimination have been associated with adverse birth outcomes among US-born women, yet not recently migrated foreign-born Black women. However, as foreign-born Black women assimilate into US society, they begin to have greater reporting of racial discrimination experiences and present more adverse birth outcomes, mirroring those of US-born Black women. This study cannot unequivocally state that the difference in birth outcomes among US-born and foreign-born Black women is due to differences in perceived racial discrimination, yet the findings of this study suggest that this theory may hold true. This study provides a basis for future research in the areas of nativity, racial discrimination, and acculturation.

REFERENCES

Accortt, E. E., Cheadle, A. C. D., & Dunkel Schetter, C. (2015). Prenatal Depression and Adverse Birth Outcomes: An Updated Systematic Review. *Matern Child Health J, 19*(6), 1306-1337. doi:10.1007/s10995-014-1637-2

Accortt, E. E., & Schetter, C. D. (2014). Pregnant women screening positive for depressive symptoms at 24–28 weeks may have increased risk of preterm birth but more precise research is needed. *Evidence Based Nursing, 17*(1), 11-12. doi:10.1136/eb-2012-101164

Acevedo-Garcia, D., Soobader, M.-J., & Berkman, L. F. (2005). The Differential Effect of Foreign-Born Status on Low Birth Weight by Race/Ethnicity and Education. *Pediatrics, 115*(1), e20-e30. doi:10.1542/peds.2004-1306

Albertsen, K. (2004). Alcohol Consumption during Pregnancy and the Risk of Preterm Delivery. *Am J Epidemiol, 159*(2), 155-161. doi:10.1093/aje/kwh034

Alhusen, J. L., Bower, K. M., Epstein, E., & Sharps, P. (2016). Racial Discrimination and Adverse Birth Outcomes: An Integrative Review. *J Midwifery Womens Health, 61*(6), 707-720. doi:10.1111/jmwh.12490

Almeida, J., Becares, L., Erbetta, K., Bettegowda, V. R., & Ahluwalia, I. B. (2018). Racial/Ethnic Inequities in Low Birth Weight and Preterm Birth: The Role of Multiple Forms of Stress. *Matern Child Health J, 22*(8), 1154-1163. doi:10.1007/s10995-018-2500-7

Anderson, M. (2017). *African Immigrant Population in U.S. Steadily Climbs* Retrieved from Pew Research Center: https://www.pewresearch.org/fact-tank/2017/02/14/african-immigrant-population-in-u-s-steadily-climbs/

Andrasfay, T., & Goldman, N. (2020). Intergenerational Change in Birthweight: Effects of Foreign-born Status and Race/Ethnicity. *Epidemiology, 31*(5), 649-658. doi:10.1097/ede.0000000000001217

Appleton, A. A., Kiley, K., Holdsworth, E. A., & Schell, L. M. (2019). Social Support During Pregnancy Modifies the Association Between Maternal Adverse Childhood Experiences and Infant Birth Size. *Matern Child Health J, 23*(3), 408-415. doi:10.1007/s10995-018-02706

Bediako, P. T., Belue, R., & Hillemeier, M. M. (2015). A Comparison of Birth Outcomes Among Black, Hispanic, and Black Hispanic Women. *Journal of Racial and Ethnic Health Disparities, 2*(4), 573-582. doi:10.1007/s40615-015-0110-2

Belanoff, C., Alade, M. O., & Almeida, J. (2022). Preterm Birth Among US and Foreign-Born Non-Hispanic Black Birthing Parents in Massachusetts: Variation by Nativity, Region, and Country of Origin. *Matern Child Health J, 26*(4), 834-844. doi:10.1007/s10995-021-03368-0

Blumenshine, P., Egerter, S., Barclay, C. J., Cubbin, C., & Braveman, P. A. (2010). Socioeconomic Disparities in Adverse Birth Outcomes. *Am J Prev Med, 39*(3), 263-272. doi:10.1016/j.amepre.2010.05.012

Boullier, M., & Blair, M. (2018). Adverse Childhood Experiences. *Paediatrics and Child Health, 28*(3), 132-137. doi: https://doi.org/10.1016/j.paed.2017.12.008

Brady, S. S., Brubaker, L., Fok, C. S., Gahagan, S., Lewis, C. E., Lewis, J., . . . Constantine, M. (2020). Development of Conceptual Models to Guide Public Health Research, Practice, and Policy: Synthesizing Traditional and Contemporary Paradigms. *Health Promotion Practice, 21*(4), 510-524. doi:10.1177/1524839919890869

Bramham, K., Parnell, B., Nelson-Piercy, C., Seed, P. T., Poston, L., & Chappell, L. C. (2014). Chronic hypertension and pregnancy outcomes: systematic review and meta-analysis. *BMJ, 348*(apr15 7), g2301-g2301. doi:10.1136/bmj.g2301

Braveman, P. A., Heck, K., Egerter, S., Marchi, K. S., Dominguez, T. P., Cubbin, C., . . . Curtis, M. (2015). The role of socioeconomic factors in Black-White disparities in preterm birth. *Am J Public Health, 105*(4), 694-702. doi:10.2105/ajph.2014.302008

Cabral, H., Fried, L. E., Levenson, S., Amaro, H., & Zuckerman, B. (1990). Foreign-Born and US-Born Women: Difference in Health Behaviors and Birth Outcomes. *Am J Public Health, 80*, 70-71.

Campbell, E. E., Gilliland, J., Dworatzek, P. D. N., De Vrijer, B., Penava, D., & Seabrook, J. A. (2018). SOCIOECONOMIC STATUS AND ADVERSE BIRTH OUTCOMES: A POPULATION-BASED CANADIAN SAMPLE. *Journal of Biosocial Science, 50*(1), 102-113. doi:10.1017/s0021932017000062

Carter, E. B., Tuuli, M. G., Caughey, A. B., Odibo, A. O., Macones, G. A., & Cahill, A. G. (2016). Number of prenatal visits and pregnancy outcomes in low-risk women. *Journal of Perinatology, 36*(3), 178-181. doi:10.1038/jp.2015.183

Carter, R. T., Lau, M. Y., Johnson, V., & Kirkinis, K. (2017a). Racial Discrimination and Health Outcomes Among Racial/Ethnic Minorities: A Meta-Analytic Review. *JOURNAL OF MULTICULTURAL COUNSELING AND DEVELOPMENT, 45*. doi:10.1002/jmcd.12076

Carter, R. T., Lau, M. Y., Johnson, V., & Kirkinis, K. (2017b). Racial Discrimination and Health Outcomes Among Racial/Ethnic Minorities: A Meta-Analytic Review. *JOURNAL OF MULTICULTURAL COUNSELING AND DEVELOPMENT, 45*. doi:10.1002/jmcd.12076

Centers for Disease Control and Prevention. (2020, October 2020). Reproductive Health: Preterm Birth Retrieved from https://www.cdc.gov/reproductivehealth/maternalinfanthealth/pretermbirth.htm

Centers for Disease Control and Prevention. (2021). *Gestational Diabetes*. Retrieved from https://www.cdc.gov/diabetes/basics/gestational.html

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A Global Measure of Perceived Stress. *Journal of Health and Social Behavior, 24*(4), 11. doi:https://doi.org/10.2307/2136404

Collins, J. W., Wu, S.-Y., & David, R. J. (2002). Differing Intergenerational Birth Weights among the Descendants of US-born and Foreign-born Whites and African Americans in Illinois. *Am J Epidemiol, 155*(3), 210-216. doi:10.1093/aje/155.3.210

Damhuis, S. E., Ganzevoort, W., & Gordijn, S. J. (2021). Abnormal Fetal Growth. *Obstetrics and Gynecology Clinics of North America, 48*(2), 267-279. doi:10.1016/j.ogc.2021.02.002

Ding, X., Liang, M., Wu, Y., Qu, G., Zhang, J., Zhang, H., . . . Sun , Y. (2021). The impact of prenatal stressful life events on adverse birth outcomes: A systematic review and meta-analysis *Journal of Affective Disorders, 287*, 406-416. doi:https://doi.org/10.1016/j.jad.2021.03.083

Dole, N., Savitz, D. A., Hertz-Picciotto, I., Siega-Riz, A. M., McMahon, M. J., & Buekens, P. (2003). Maternal stress and preterm birth. *Am J Epidemiol, 157*(1), 14-24. doi:10.1093/aje/kwf176

Dole, N., Savitz, D. A., Siega-Riz, A. M., Hertz-Picciotto, I., McMahon, M. J., & Buekens, P. (2004). Psychosocial factors and preterm birth among African American and White women in central North Carolina. *Am J Public Health, 94*(8), 1358-1365. doi:10.2105/ajph.94.8.1358

Dominguez, T. P. (2011). Adverse Birth Outcomes in African American Women: The Social Context of Persistent Reproductive Disadvantage. *Social Work in Public Health, 26*(1), 3-16. doi:10.1080/10911350902986880

Dominguez, T. P., Dunkel-Schetter, C., Glynn, L. M., Hobel, C., & Sandman, C. A. (2008). Racial differences in birth outcomes: the role of general, pregnancy, and racism stress. *Health Psychol, 27*(2), 194-203. doi:10.1037/0278-6133.27.2.194

Dominguez, T. P., Schetter, C. D., Mancuso, R., Rini, C. M., & Hobel, C. (2005). Stress in African American pregnancies: testing the roles of various stress concepts in prediction of birth outcomes. *Ann Behav Med, 29*(1), 12-21. doi:10.1207/s15324796abm2901_3

Dominguez, T. P., Strong, E. F., Krieger, N., Gillman, M. W., & Rich-Edwards, J. W. (2009). Differences in the self-reported racism experiences of US-born and foreign-born Black pregnant women. *Soc Sci Med, 69*(2), 258-265. doi:10.1016/j.socscimed.2009.03.022

Dominguez, T. P., Strong, E. F., Krieger, N., Gillman, M. W., & Rich-Edwards, J. W. (2009). Differences in the self-reported racism experiences of US-born and foreign-born Black pregnant women. *Social Science & Medicine, 69*(2), 258-265. doi:10.1016/j.socscimed.2009.03.022

Earnshaw, V. A., Rosenthal, L., Lewis, J. B., Stasko, E. C., Tobin, J. N., Lewis, T. T., . . . Ickovics, J. R. (2013). Maternal Experiences with Everyday Discrimination and Infant Birth Weight: A Test of Mediators and Moderators Among Young, Urban Women of Color. *Annals of Behavioral Medicine, 45*(1), 13-23. doi:10.1007/s12160-012-9404-3

Elo, I. T., Mehta, N., & Huang, C. (2008). Health of Native-born and Foreign-born Black Residents in the
United States: Evidence from the 2000 Census of Population and
the National Health Interview Survey *Population Aging Research Center Working Paper Series*.

Elo, I. T., Vang, Z., & Culhane, J. F. (2014). Variation in Birth Outcomes by Mother's Country of Birth Among Non-Hispanic Black Women in the United States. *Matern Child Health J, 18*(10), 2371-2381. doi:10.1007/s10995-014-1477-0

Elsayed, A., Amutah-Onukagha, N. N., Navin, L., Gittens-Williams, L., & Janevic, T. (2019). Impact of Immigration and Duration of Residence im US on Length of Gestation Amoong Black Women in Newark, New Jersey. *Journal of Immigrant and Minority Health, 21*, 1095-1101. doi:10.1007/s10903-018-0813-7

Ely, D., & Discroll, A. (2019). *Infant Mortality in the United States, 2017: Data From the Period Linked Birth/Infant Death File*. Retrieved from https://www.cdc.gov/nchs/data/nvsr/nvsr68/nvsr68_10-508.pdf

Ewing, A. C., Ellington, S. R., Shapiro-Mendoza, C. K., Barfield, W. D., & Kourtis, A. P. (2017). Full-Term Small-for-Gestational-Age Newborns in the U.S.: Characteristics, Trends, and Morbidity. *Matern Child Health J, 21*(4), 786-796. doi:10.1007/s10995-016-2165-z

Ferre, C., Callaghan, W., Olson, C., Sharma, A., & Barfield, W. D. (2016). *Effect of Maternal Age and Age-Specific Preterm Birth Rates on Overall Preterm Birth Rates-United States, 2007 and 2014*. Retrieved from JSTOR:

Ford, C. L., & Airhihenbuwa, C. O. (2010a). Critical Race Theory, Race Equity, and Public Health: Toward Antiracism Praxis. *Am J Public Health, 100*(S1), S30-S35. doi:10.2105/ajph.2009.171058

Ford, C. L., & Airhihenbuwa, C. O. (2010b). The public health critical race methology: Praxis for antiracism research. *Soc Sci Med, 71*, 1390-1398. doi:10.1016/j.socscimed.2010.07.030

Fox, M., Thayer, Z. M., & Wadhwa, P. D. (2017). Acculturation and Health: The Moderating Role of Sociocultural Context. *American Anthropologist, 119*(3), 405-421. doi:10.1111/aman.12867

Fuchs, F., & Senat, M. V. (2016). Multiple gestations and preterm birth. *Semin Fetal Neonatal Med, 21*(2), 113-120. doi:10.1016/j.siny.2015.12.010

Fuentes-Afflick, E., Hessol, N. A., & Pérez-Stable, E. J. (1999). Testing the Epidemiologic Paradox of Low Birth Weight in Latinos. *Archives of Pediatrics & Adolescent Medicine, 153*(2). doi:10.1001/archpedi.153.2.147

Gee, G. C., Ro, A., Shariff-Marco, S., & Chae, D. (2009). Racial Discrimination and Health Among Asian Americans: Evidence, Assessment, and Directions for Future Research. *Epidemiologic Reviews, 31*(1), 130-151. doi:10.1093/epirev/mxp009

Geronimus, A., Hicken, M., Keene, D., & Bound, J. (2006). “Weathering” and Age Patterns of Allostatic Load Scores Among Blacks and Whites in the United States *American Journal of Public Health 96*(5), 826-833.

Geronimus, A. T., Hicken, M., Keene, D., & Bound, J. (2006). "Weathering" and age patterns of allostatic load scores among blacks and whites in the United States. *Am J Public Health, 96*(5), 826-833. doi:10.2105/ajph.2004.060749

Glover, V., O’Conner, T. G., & O’Donnell, K. (2010). Prenatal stress and the programming of the HPA axis *Neuroscience and biobehavioral reviews, 35*(1), 17-22. doi:https://doi.org/10.1016/j.neubiorev.2009.11.008

Goldenberg, R. L., Culhane, J. F., Iams, J. D., & Romero, R. (2008). Epidemiology and causes of preterm birth. *The Lancet, 371*(9606), 75-84. doi:10.1016/s0140-6736(08)60074-4

González-Quintero, V. H., Tolaymat, L., Luke, B., González-García, A., Duthely, L., O'Sullivan, M. J., & Martin, D. (2006). Outcome of pregnancies among Hispanics: revisiting the epidemiologic paradox. *The Journal of Reproductive Medicine 51*(1), 10-14.

Green, T. (2014). Hispanic Self-identification and Birth Weight Outcomes among U.S.- and Foreign-born Blacks. *The Review of Black Political Economy, 41*(3), 319-336. doi:10.1007/s12114-014-9186-x

Grigoriadis, S., Graves, L., Peer, M., Mamisashvili, L., Tomlinson, G., Vigod, S. N., . . . Richter, M. (2018). Maternal Anxiety During Pregnancy and the Association With Adverse Perinatal Outcomes. *The Journal of Clinical Psychiatry, 79*(5). doi:10.4088/jcp.17r12011

Guidelines for Perinatal Care (2017). In S. Kilpatrick & L.-A. Papile (Eds.).

Hadlock, F. P., Harrist, R. B., & Martinez-Poyer, J. (1991). In Utero Analysis of Fetal Growth: A Sonographic Weight Standard. *Radiology 181*(1). doi:https://doi.org/10.1148/radiology.181.1.1887021

Hansen Precht, D., Kragh Andersen, P., & Olsen, J. (2007). Severe life events and impaired fetal growth: a nation-wide study with complete follow-up. *Acta Obstetricia et Gynecologica Scandinavica, 86*(3), 266-275. doi:10.1080/00016340601088406

Heller, H. M., Draisma, S., & Honig, A. (2022). Construct Validity and Responsiveness of Instruments Measuring Depression and Anxiety in Pregnancy: A Comparison of EPDS, HADS-A and CES-D. *International Journal of Environmental Research and Public Health, 19*(13), 7563. doi:10.3390/ijerph19137563

Henderson, J., Gary, R., & Brocklehurst, P. (2007). Systematic Review of effects of low-moderate prenatal alcohol exposure on pregnancy outcome. *BJOG: An International Journal of Obstetrics & Gynaecology, 114*(3), 243-253. doi:10.1111/j.1471-0528.2006.01163.x

Hibbs, S. D., Rankin, K. M., DeSisto, C. L., & Collins, J. W. (2018). The age-related patterns of preterm birth among urban African-American and non-Latina White mothers: The effect of paternal involvement. *Social Science & Medicine, 211*, 16-20. doi:https://doi.org/10.1016/j.socscimed.2018.05.050

Hoggatt, K. J., Flores, M., Solorio, R., Wilhelm, M., & Ritz, B. (2012). The "Latina Epidemiologic Paradox" Revisited: The Role of Birthplace and Acculturation in

Predicting Infant Low Birth Weight for Latinas in Los Angeles, CA. *Journal of Immigrant and Minority Health, 14*(5), 875-884. doi:10.1007/s10903-011-9556-4

Hossin, M. Z. (2020). International migration and health: it is time to go beyond conventional theoretical frameworks. *BMJ Global Health, 5*(2), e001938. doi:10.1136/bmjgh-2019-001938

Ichou, M., & Wallace, M. (2019). The Healthy Immigrant Effect: The role of educational selectivity in the good health of migrants. *Demographic Research, 40*, 61-94. doi:10.4054/demres.2019.40.4

Jones, C. (2000). Levels of racism: a theoretic framework and a gardener's tale. *Am J Public Health, 90*(8), 1212-1215. doi:10.2105/ajph.90.8.1212

Jones, C. P. (2018). Toward the Science and Practice of Anti-Racism: Launching a National Campaign Against Racism. *Ethnicity & Disease, 28*(Supp 1), 231. doi:10.18865/ed.28.s1.231

Joseph, K., Fahey, J., Shankardass, K., Allen, V. M., O'Campo, P., Dodds, L., . . . Allen, A. C. (2014). Effects of socioeconomic position and clinical risk factors on spontaneous and iatrogenic preterm birth. *BMC Pregnancy Childbirth, 14*(1), 117. doi:10.1186/1471-2393-14-117

Khalil, A., Syngelaki, A., Maiz, N., Zinevich, Y., & Nicolaides, K. H. (2013). Maternal age and adverse pregnancy outcome: a cohort study. *Ultrasound in Obstetrics & Gynecology, 42*(6), 634-643. doi:10.1002/uog.12494

Kim, D. R., Sockol, L. E., Sammel, M. D., Kelly, C., Moseley, M., & Epperson, C. N. (2013). Elevated risk of adverse obstetric outcomes in pregnant women with depression. *Archives of Women's Mental Health, 16*(6), 475-482. doi:10.1007/s00737-013-0371-x

Kotelchuck, M. (1994). The Adequacy of Prenatal Care Utilization Index: its US distribution and association with low birthweight. *Am J Public Health, 84*(9), 1486-1489. doi:10.2105/ajph.84.9.1486

Kothari, C., Paul, R., Dormitorio, B., Ospina, F., James, A., Lenz, D., . . . Wiley, J. (2016). The interplay of race, socieconomic status and neighborhood residence upon birth outcomes in a high back infant mortality community *SSM -Population Health 2*, 859-867. doi:https://doi.org/10.1016/j.ssmph.2016.09.011

Krieger, N., Kosheleva, A., Waterman, P. D., Chen, J. T., & Koenen, K. (2011). Racial Discrimination, Psychological Distress, and Self-Rated Health Among US-Born and Foreign-Born Black Americans. *Am J Public Health, 101*(9), 1704-1713. doi:10.2105/ajph.2011.300168

Krieger, N., Smith, K., Naishadham, D., Hartman, C., & Barbeau, E. M. (2005). Experiences of discrimination: Validity and reliability of a self-report measure for population health research on racism and health. *Social Science & Medicine, 61*(7), 1576-1596. doi:10.1016/j.socscimed.2005.03.006

Larrabee Sonderlund, A., Schoenthaler, A., & Thilsing, T. (2021). The Association between Maternal Experiences of Interpersonal Discrimination and Adverse Birth Outcomes: A Systematic Review of the Evidence. *International Journal of Environmental Research and Public Health, 18*(4), 1465. doi:10.3390/ijerph18041465

Latendresse, G. (2009). The interaction between chronic stress and pregnancy: preterm birth from a biobehavioral perspective. *J Midwifery Womens Health, 54*(1), 8-17. doi:10.1016/j.jmwh.2008.08.001

Lauderdale, D. S., Wen, M., Jacobs, E. A., & Kanduka, N. R. (2006). Immigrant Perdeptions od Discrimination in Health Care *The Califorina Health Interview Survey 2003*. *Medical Care, 44*(10), 914- 920.

Leimert, K. B., & Olson, D. M. (2020). Racial disparities in pregnancy outcomes: genetics, epigenetics, and allostatic load *Current Opinion in Physiology, 13*, 155-165.

Li, F., Wang, T., Chen, L., Zhang, S., Chen, L. z., & Qin, J. (2021). Adverse pregnancy outcomes among mothers with hypertensive disorders in pregnancy: A meta-analysis of cohort studies. *Pregnancy Hypertension: An International Journal of Women's Cardiovascular Health, 24*, 107-117. doi:https://doi.org/10.1016/j.preghy.2021.03.001

Li, X., Gao, R., Dai, X., Liu, H., Zhang, J., Liu, X., . . . Xia, W. (2020). The association between symptoms of depression during pregnancy and low birth weight: a prospective study. *BMC Pregnancy Childbirth, 20*(1). doi:10.1186/s12884-020-2842-1

Liu, B., Xu, G., Sun, Y., Qiu, X., Ryckman, K. K., Yu, Y., . . . Bao, W. (2020). Maternal cigarette smoking before and during pregnancy and the risk of preterm birth: A dose–response analysis of 25 million mother–infant pairs. *PLOS Medicine, 17*(8), e1003158. doi:10.1371/journal.pmed.1003158

Luu, T. M., Katz, S. L., Leeson, P., Thébaud, B., & Nuyt, A. M. (2016). Preterm birth: risk factor for early-onset chronic diseases. *Cmaj, 188*(10), 736-746. doi:10.1503/cmaj.150450

Mccowan, L., & Horgan, R. P. (2009). Risk factors for small for gestational age infants. *Best Practice & Research Clinical Obstetrics & Gynaecology, 23*(6), 779-793. doi:10.1016/j.bpobgyn.2009.06.003

Mccowan, L., Roberts, C., Dekker, G., Taylor, R., Chan, E., Kenny, L., . . . North, R. (2010). Risk factors for small-for-gestational-age infants by customised birthweight centiles: data from an international prospective cohort study. *BJOG: An International Journal of Obstetrics & Gynaecology, 117*(13), 1599-1607. doi:10.1111/j.1471-0528.2010.02737.x

Mchale, P., Maudsley, G., Pennington, A., Schlüter, D. K., Barr, B., Paranjothy, S., & Taylor-Robinson, D. (2022). Mediators of socioeconomic inequalities in preterm birth: a systematic review. *BMC Public Health, 22*(1). doi:10.1186/s12889-022-13438-9

Mckenzie-Sampson, S., Baer, R. J., Blebu, B. E., Karasek, D., Oltman, S. P., Pantell, M. S., . . . Chambers, B. D. (2021). Maternal nativity and risk of adverse perinatal outcomes among Black women residing in California, 2011–2017. *Journal of Perinatology*. doi:10.1038/s41372-021-01149-9

Mikolajczyk, R. T., Zhang, J., Betran, A. P., Souza, J. P., Mori, R., Gülmezoglu, A. M., & Merialdi, M. (2011). A Global Reference for Fetal-weight and Birthweight Percentiles. *Lancet, 377*(9780), 1855-1961. doi:doi: 10.1016/S0140-6736(11)60364-4

Minhas, A. S., Boakye, E., Obisesan, O. H., Kwapong, Y. A., Zakaria, S., Creanga, A. A., . . . Sharma, G. (2022). The Association of Preterm Birth With Maternal Nativity and Length of Residence Among Non-Hispanic Black Women. *CJC Open, 4*(3), 289-298. doi:10.1016/j.cjco.2021.10.009

Mirabzadeh, A., Dolatian, M., Forouzan, A. S., Sajjadi, H., Majd, H. A., & Mahmoodi, Z. (2013). Path Analysis Associations Between Perceived Social Support, Stressful Life Events and Other Psychosocial Risk Factors During Pregnancy and Preterm Delivery. *Iranian Red Crescent Medical Journal, 15*(6), 507-514. doi:10.5812/ircmj.11271

Misra, D., Strobino, D., & Trabert, B. (2010). Effects of social and psychosocial factors on risk of preterm birth in black women. *Paediatric and Perinatal Epidemiology, 24*(6), 546-554. doi:10.1111/j.1365-3016.2010.01148.x

Misra, D. P., O'Campo, P., & Strobino, D. (2001). Testing a sociomedical model for preterm delivery. *Paediatric and Perinatal Epidemiology, 15*(2), 110-122. doi:10.1046/j.1365-3016.2001.00333.x

Monk, C., Lugo-Candelas, C., & Trumpff, C. (2019). Prenatal Developmental Origins of Future Psychopathology: Mechanisms and Pathways. *Annual Review of Clinical Psychology, 15*(1), 317-344. doi:10.1146/annurev-clinpsy-050718-095539

Montoya-Williams, D., Barreto, A., Fuentes-Afflick, E., & Collins, J. W. (2022). Nativity and Perinatal outcome disparities in the United States: Beyond the immigrant paradox. *Seminars in Perinatology, 46*(8). doi:https://doi.org/10.1016/j.semperi.2022.151658

Morgan, N., Christensen, K., Skedros, G., Kim, S., & Schliep, K. (2022). Life stressors, hypertensive disorders of pregnancy, and preterm birth. *Journal of Psychosomatic Obstetrics & Gynecology, 43*(1), 42-50. doi:10.1080/0167482x.2020.1778666

Moster, D., Lie, R. T., & Markestad, T. (2008). Long-term medical and social consequences of preterm birth. *N Engl J Med, 359*(3), 262-273. doi:10.1056/NEJMoa0706475

Moussa, H. N., Arian, S. E., & Sibai, B. M. (2014). Management of Hypertensive Disorders in Pregnancy. *Women's Health, 10*(4), 385-404. doi:10.2217/whe.14.32

Ncube, C. N., Enquobahrie, D. A., Albert, S. M., Herrick, A. L., & Burke, J. G. (2016). Association of neighborhood context with offspring risk of preterm birth and low birthweight: A systematic review and meta-analysis of population-based studies. *Social Science & Medicine, 153*, 156-164. doi:10.1016/j.socscimed.2016.02.014

Noh, S., Kaspar, V., & Wickrama, K. A. S. (2007). Overt and Subtle Racial Discrimination and Mental Health: Preliminary Findings for Korean Immigrants. *Am J Public Health, 97*(7), 1269-1274. doi:10.2105/ajph.2005.085316

Nykjaer, C., Alwan, N. A., Greenwood, D. C., Simpson, N. A. B., Hay, A. W. M., White, K. L. M., & Cade, J. E. (2014). Maternal alcohol intake prior to and during pregnancy and risk of adverse birth outcomes: evidence from a British cohort. *Journal of Epidemiology and Community Health, 68*(6), 542-549. doi:10.1136/jech-2013-202934

O'Leary, C. M., & Bower, C. (2012). Guidelines for pregnancy: what's an acceptable risk, and how is the evidence (finally) shaping up? . *Drug and Alcohol Review 31*(2), 170-183. doi:10.1111/j.1465-3362.2011.00331.x.

Olson, D. M., Severson, E. M., Verstraeten, B. S., Ng, J. W., McCreary, J. K., & Metz, G. A. (2015). Allostatic Load and Preterm Birth. *Int J Mol Sci, 16*(12), 29856-29874. doi:10.3390/ijms161226209

Palarino, J. V. (2021). The Immigrant Health Advantage: An Examination of African-Origin Black Immigrants in the United States. *Population Research and Policy Review, 40*(5), 895-929. doi:10.1007/s11113-021-09647-6

Partridge, S., Balayla, J., Holcroft, C., & Abenhaim, H. (2012). Inadequate Prenatal Care Utilization and Risks of Infant Mortality and Poor Birth Outcome: A

Retrospective Analysis of 28,729,765 U.S. Deliveries over 8 Years. *American Journal of Perinatology, 29*(10), 787-794. doi:10.1055/s-0032-1316439

Patra, J., Bakker, R., Irving, H., Jaddoe, V., Malini, S., & Rehm, J. (2011). Dose-response relationship between alcohol consumption before and during pregnancy and the risks of low birthweight, preterm birth and small for gestational age (SGA)-a systematic review and meta-analyses. *BJOG: An International Journal of Obstetrics & Gynaecology, 118*(12), 1411-1421. doi:10.1111/j.1471-0528.2011.03050.x

Phelan, J., & Link, B. (2015). Is racism a fundamental cause of inequalities in health. *Annual Review of Sociology, 41*, 311-330. doi:10.1146/annurev-soc-073014-112305

Räisänen, S., Gissler, M., Sankilampi, U., Saari, J., Kramer, M. R., & Heinonen, S. (2013). Contribution of socioeconomic status to the risk of small for gestational age infants – a population-based study of 1,390,165 singleton live births in Finland. *International Journal for Equity in Health, 12*(1), 28. doi:10.1186/1475-9276-12-28

Rankin, K. M., David, R. J., & Collins, J. W., Jr. (2011). African American women's exposure to interpersonal racial discrimination in public settings and preterm birth: the effect of coping behaviors. *Ethn Dis, 21*(3), 370-376.

Rosenthal, L., & Lobel, M. (2011). Explaining racial disparities in adverse birth outcomes: unique sources of stress for Black American women. . *Social Science & Medicine, 72*(6), 977–983. doi: https://doi.org/10.1016/j.socscimed.2011.01.013

Ryan, A. M., Gee, G. C., & Laflamme, D. F. (2006). The Association between Self-Reported Discrimination, Physical Health and Blood Pressure: Findings from African Americans, Black Immigrants, and Latino Immigrants in New Hampshire. *Journal of Health Care for the Poor and Underserved, 17*(2), 116-132. doi:10.1353/hpu.2006.0079

Sanchez-Vaznaugh, E. V., Braveman, P. A., Egerter, S., Marchi, K. S., Heck, K., & Curtis, M. (2016). Latina Birth Outcomes in California: Not so Paradoxical. *Matern Child Health J, 20*(9), 1849-1860. doi:10.1007/s10995-016-1988-y

Sawyer, P. J., Major, B., Casad, B. J., Townsend, S. S. M., & Mendes, W. B. (2012). Discrimination and the Stress Response: Psychological and Physiological Consequences of Anticipating Prejudice in Interethnic Interactions. *Am J Public Health, 102*(5), 1020-1026. doi:10.2105/ajph.2011.300620

Settles, I. H. (2006). Use of an Intersectional Framework to Understand Black Women's Racial and Gender Identities. *Sex Roles, 54*(9-10), 589-601. doi:10.1007/s11199-006-9029-8

Shah, N. R., & Bracken, M. B. (2000). A systematic review and meta-analysis of prospective studies on the association between maternal cigarette smoking and preterm delivery. *American Journal of Obstetrics and Gynecology, 182*(2), 465-472. doi:10.1016/s0002-9378(00)70240-7

Shah, P. S., Zao, J., & Ali, S. (2011). Maternal Marital Status and Birth Outcomes: A Systematic Review and Meta-Analyses. *Matern Child Health J, 15*(7), 1097-1109. doi:10.1007/s10995-010-0654-z

Shapiro, G., Bushnik, T., Wilkins, R., Kramer, M. S., Kaufman, J. S., Sheppard, A. J., & Yang, S. (2018). Adverse birth outcomes in relation to maternal marital and cohabitation status in Canada. *Annals of Epidemiology 28*(8), 503-509. doi:https://doi.org/10.1016/j.annepidem.2018.05.001

Sheldon Cohen, & Gail Williamson. (1988). Perceived Stress in a Probability Sample of the United States. In *The Social Psychology of Health*. Newbury Park, California Sage

Shin, D., & Song, W. O. (2019). Influence of the Adequacy of the Prenatal Care Utilization Index on Small-For-Gestational-Age Infants and Preterm Births in the United States. *Journal of Clinical Medicine, 8*(6), 838. doi:10.3390/jcm8060838

Simmons, L. E., Rubens, C. E., Darmstadt, G. L., & Gravett, M. G. (2010). Preventing Preterm Birth and Neonatal Mortality: Exploring the Epidemiology, Causes, and Interventions *Seminars in Perinatology, 34*(6), 408-415. doi:https://doi.org/10.1053/j.semperi.2010.09.005

Slaughter-Acey, J. C., Talley, L. M., Stevenson, H. C., & Misra, D. P. (2019). Personal Versus Group Experiences of Racism and Risk of Delivering a Small-for-Gestational Age Infant in African American Women: a Life Course Perspective. *J Urban Health, 96*(2), 181-192. doi:10.1007/s11524-018-0291-1

Swamy, G. K., Ostbye, T., & Skjaerven, R. (2008). Association of preterm birth with long-term survival, reproduction, and next-generation preterm birth. *Jama, 299*(12), 1429-1436. doi:10.1001/jama.299.12.1429

Szaflarski, M., & Bauldry, S. (2019). The Effects of Perceived Discrimination on Immigrant and Refugee Physical and Mental Health. In *Immigration and Health* (pp. 173-204): Emerald Publishing Limited.

Taylor, C. A. L., & Sarathchandra, D. (2016). Migrant Selectivity or Culutral Buffering? Investigating the Black Immigrant Health Advantage in Low Birth Weight.

Journal Immigrant Minority Health, 18, 390-396. doi:10.1007/s10903-015-0194-0

Torres-Harding, S. R., Andrade, J., Alejandrio, L. , & Romero Diaz, C. E. (2012). The Racial Microagressions Scale (RMAS): A New Scale to Measure Experiences of Racial Microaggressions in People of Color. *Cultural Diversity and Ethnic Minority Pyschology, 18*(2), 153-154. doi:10.1037/a0027658

Valles, S. A. (2016). The challenges of choosing and explaining a phenomenon in epidemiological research on the "Hispanic Paradox". *Theoretical Medicine and Bioethics, 37*(2), 129-148. doi:10.1007/s11017-015-9349-1

VanderWeele, T. (2016). Mediation Analysis:A Practitioner's Guide. *Annual Review Public Health 37*, 17-32. doi:10.1146/annurev-publhealth-032315-021402

Venters, H., & Gany, F. (2011). African Immigrant Health. *Journal of Immigrant and Minority Health, 13*(2), 333-344. doi:10.1007/s10903-009-9243-x

Ville, Y., & Rozenberg, P. (2018). Predictors of preterm birth. *Best Pract Res Clin Obstet Gynaecol, 52*, 23-32. doi:10.1016/j.bpobgyn.2018.05.002

Viruell-Fuentes, E. A., Mirand, P. Y., & Abdulrahim, S. (2012). More than culture: Structural racism, intersectionality theory, and immigrant health. *Social Science & Medicine, 75*, 2099-2106. doi:doi:10.1016/j.socscimed.2011.12.037

Wagijo, M. A., Sheikh, A., Duijts, L., & Been, J. (2017). Reducing tobacco smoking and smoke exposure to prevent preterm birth and its complications. *Paediatric Respiratory Reviews, 22*, 3-10. doi:https://doi.org/10.1016/j.prrv.2015.09.002

Wasse, H., Holt, V. L., & Daling, J. R. (1994). Pregnancy risk factors and birth outcomes in Washington State: a comparison of Ethiopian-born and US-born women. *Am J Public Health, 84*(9), 1505-1507. doi:10.2105/ajph.84.9.1505

Whitehead, N. S. (2012). The Relationship of Socioeconomic Status to Preterm Contractions and Preterm Delivery. *Matern Child Health J, 16*(8), 1645-1656. doi:10.1007/s10995-012-0948-4

Williams, D. R., & Mohammed, S. A. (2009). Discrimination and racial disparities in health: evidence and needed research. *Journal of Behavioral Medicine, 32*(1), 20-47. doi:10.1007/s10865-008-9185-0

Ye, W., Luo, C., Huang, J., Li, C., Liu, Z., & Liu, F. (2022). Gestational diabetes mellitus and adverse pregnancy outcomes: systematic review and meta-analysis. *BMJ*, e067946. doi:10.1136/bmj-2021-067946

APPENDIX A: Table 1

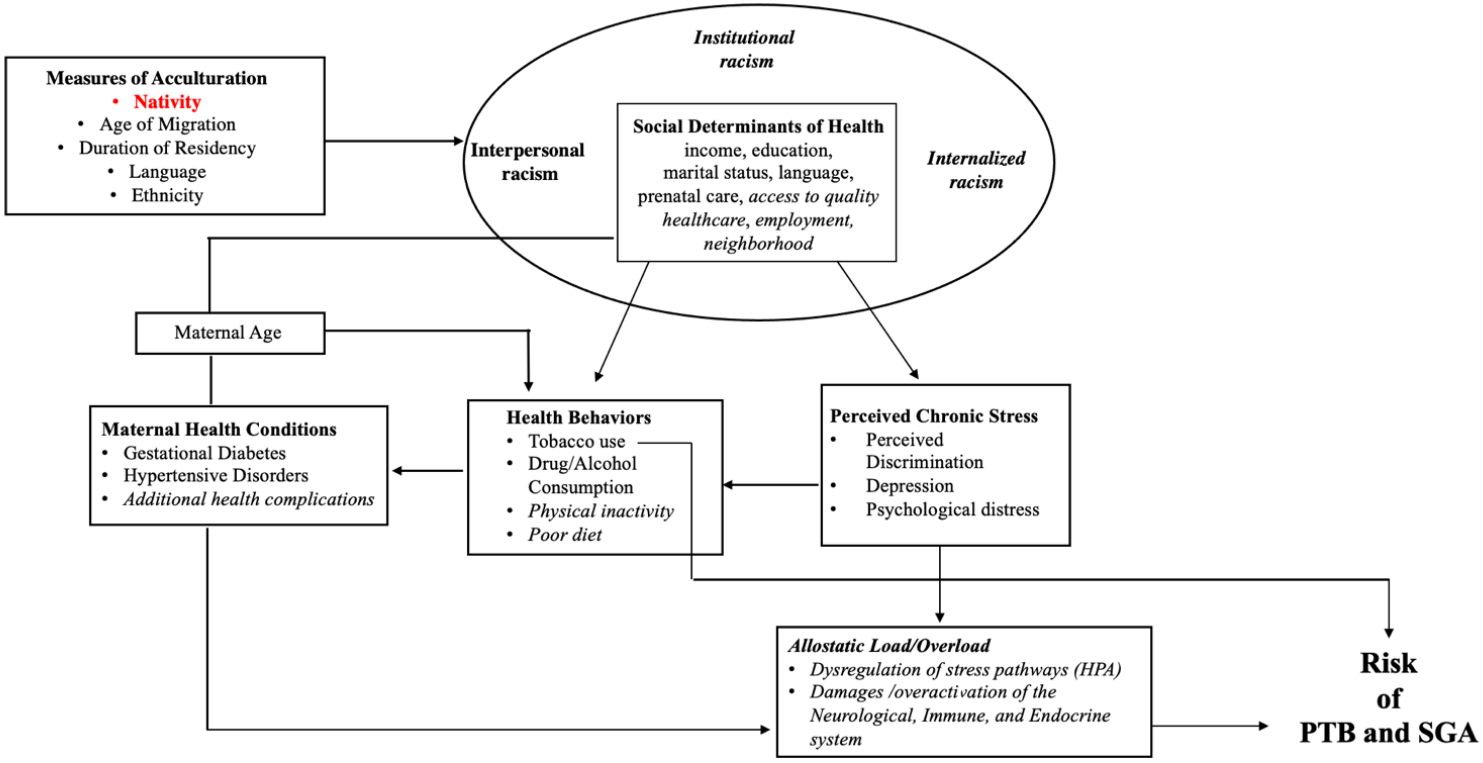
Table 1: Birth Outcomes among US-born and Foreign-born Black Women

	Study Design	**Study Sample**	**Outcome**	**Covariates**	**Main Findings**
Cabral et al., (1990) *Subset from Parent longitudinal study 1984-Boston City Hospital*	PCS	N= 817 *USB: 616* *FBB: 201*	LBW, PTB, BW, length, HC, GA	Weight gain during pregnancy, pre-pregnancy weight-for-height, marital status, maternal age, education, PNC, cigarette, alcohol, marijuana, cocaine use	Infants of FB black women had heavier, longer, and larger infants compared to USB after adjusting for covariates. Odds of LBW (aOR= 0.81, 95% CI 0.42-1.53) and PTB (aOR= 0.54, 95%CI 0.24,1.18) remained decreased for FB women, but no significant difference to USB black women
Wasse et al., (1994) *Washington State birth from 1980 to 1991*	CS	N= 1342 *USB: 532* *WH: 546* *FBB: 264*	BW	Age, smoking, marital status, parity, PNC, diabetes, family income	FB Black women were less likely to have LBW infants compared to US-born Black women. After adjustment, the relative risk of LBW was similar to USB (RR= 0.90, 95%CI = 0.50-1.70) and WH (RR= 1.10, 95%CI 0.60, 2.10) FB had heavier infants after 38-week gestation (aRR=4.00 95%CI 2.30, 6.80) compared to USB
Acevedo-Garcia et al., (2005) *1998 Detail Natality data set (50 states)*	CS	N= 2,436,890 White: *US:1,574,088* *FB: 80,319* Black: *US: 322,510* *FB: 40,213* Asian: *US: 10,466* *FB: 74,617* Hispanic: *US: 130,267* *FB: 204,230*	LBW	Maternal age, race/ethnicity, nativity status, marital status, PNC, tobacco, alcohol, chronic hypertension, anemia, diabetes, medical risk (preeclampsia, eclampsia, placenta abruption)	Foreign-born status reduced the risk of LBW among Black (aOR= 0.77, 95%CI 0.74-0.80) and Hispanic (aOR=0.77, 95%CI 0.75-0.80) women Foreign-born status serves as more of a protective factor among Black, Hispanic, and white women with low education

Elo et al., (2014) *2008 Vital Statistics (27 states)*	CS	N= 344,121 *USB: 296,787 FBB: 47,334*	PTB, SGA	Maternal age, education, marital status, PNC, smoking during pregnancy, chronic/pregnancy-induced hypertension & diabetes	FB Black women had lower odds of PTB (aOR=0.72, 95%CI 0.73-0.74) and SGA (aOR= 0.74, 95%CI 0.74-0.75) compared to US Black women after controlling for all study covariates
Taylor & Sarathchandra (2016) *US Fragile Families and Child Wellbeing Survey, longitudinal survey 1998-2000*	PCS	N= 2,389 *USB: 2256 FBB:124*	LBW	Maternal age, education, PNC, smoking, drug, alcohol use during pregnancy	Foreign born Black mothers had reduced odds of having a LBW child compared to US Black women (OR=0.44, p<.01) Foreign born advantages (i.e., reduced odds of LBW) persisted when adjusting for maternal age, education, PNC (model 1) (aOR=0.43, p <.05); yet not when adjusting for risky health behaviors (i.e., smoking, alcohol, and drug use) (aOR=0.58, NS) (model 2)
Mckenzie-Sampson et al., (2021) *California Vital Statistics, 2011-2017*	CS	N= 146,671 *USB:129,775 FBB:16,896*	PTB, SGA	Maternal age, education, health insurance, WIC participate, pre-pregnancy BMI, parity, adequacy of PNC, smoking, alcohol drug use during pregnancy, pre-existing or gestational hypertension and diabetes	US born Black women where approximately 50% more likelihood of having an infant that was preterm (aRR= 1.51, 95%CI 1.39, 1.65) and small for gestational age (aRR=1.52, 95% CI 1.41,1.64) compared to foreign born Black women after adjusting for covariates
Belanoff et al., (2022) *Boston Worcester and Springfield metropolitan areas of MA, 2011-2015*	CS	N= 26,648 *USB: 12,292 FBB:14,356*	PTB	Marital status, age, education, pre-pregnancy BMI, smoking during pregnancy, adequacy PNC, anemia, hemoglobinopathy, lung disease, prior cesarean delivery, gestational or pre-pregnancy diabetes, prenatal hospitalization, hypertension, pre-eclampsia, eclampsia, prior PTB, renal disease	Risk of PTB was lower for foreign -born Black women compared to US-born Black women (OR= 0.80, 95%CI 0.74-0.87) FB black mothers from sub-Saharan African presented the lowest risk (OR=0.68 95%CI 0.61-0.76) After adjustment of covariates, the odds of PTB among foreign-born Black mothers was unchanged (aOR=.80, 95%CI 0.73-0.88)

US- US-born, FB- foreign-born, USB= US-born Black women, FBB- foreign-born Black women, WH- Non-Hispanic white women, LBW- low birthweight, PTB- preterm birth, SGA- small for gestational age, BW-birthweight, GA-gestational age, HC-Head Circumference, PNC= Prenatal Care, PCS- Prospective Cohort study, CS- cross-sectional, OR- odds ratio, RR- Risk Ratio, aOR- adjusted odds ratio, aRR- adjusted relative risk

APPENDIX B: Conceptual Model



APPENDIX C: Study Flyer

Want to improve the health of Black infants? Are you..

Black/ African American Mother & **Have at least one child** & **Currently or perviously enrolled in Healthy Start**

WE NEED YOU!

Complete a brief survey about your experiences of racial discrimination and receive 200 Stork Nest points!

INTERESTED?
SCAN HERE FOR SURVEY

https://redcap.link/BLKwomenbirths

P.I. Investigator:
Dr. Anne Wallis
Co-Investigator:
Kendria Kelly-Taylor, MSPH
Contact for questions:
kendria.kelly-taylor@louisville.edu
(404) 617-9153

EveryStep

UNIVERSITY OF LOUISVILLE.
SCHOOL OF PUBLIC HEALTH & INFORMATION SCIENCES

APPENDIX D: Study Recruitment

Study Snapshot

Study Title: Are their differences in birth outcomes between foreign-born and US-born Black mothers? The role of perceived racial discrimination, preterm birth, and small for gestational age.

Purpose of the study: There are two main study objectives: (1) To examine if experiences of racial discrimination impact birth outcomes, for example the birth weight of a baby, among women who identify as Black, and (2) To investigate if there are differences in the reporting of racial discrimination and other life stressors among foreign-born and US-born Black women.

Study Procedure: We are asking study participants to complete a survey about their experiences of racial discrimination and what situations they perceive to be stressful.

Survey Time: The survey is estimated to take 10 to 15 minutes.

Eligible participants: (1) Mothers of at least one live birth who are currently or previously enrolled in the Des Moines Healthy Start program and (2) Self-identify as Black and/or African American.

> **If a participant does not identify as Black or African American, younger than 18 years of age at the study start date, and/or has multiple gestations (i.e., twins or triplets), they are NOT eligible to participant in the study.*

Study Significance: The goal of this study is to further our understanding of the relationship between racial discrimination and birth outcomes among US-born and

foreign -born Black women. Black women residing in the US experience the worse birth outcomes compared to other racial and ethnic groups. Research suggests exposure to racial discrimination may be a driving force, yet further understanding of this risk factor is needed. Our goal is to expand our understanding of discrimination and birth outcomes beyond the historically researched Black-white dyad. We hope the findings of the study will support the development of culturally appropriate interventions and structural/policy changes that specifically target this risk factor.

Survey Access: OR code or Survey Link!

Or
https://redcap.link/BLKwomenbirths

APPENDIX E: Data Agreement

RESEARCH AGREEMENT

BETWEEN

DES MOINES, IOWA HEALTHY START/EMPOWERMENT PROGRAM

AND

ANNE B. WALLIS, PHD AND KENDRIA KELLY-TAYLOR, MSPH

(UNIVERSITY OF LOUSIVILLE- RESEARCHER NAMES)

This agreement is made and entered into this 8th day of June 2022, by and between the Des Moines, Iowa Healthy Start and University of Louisville's Anne B. Wallis and Kendria Kelly-Taylor (Researchers).

I. Purpose. Des Moines, Iowa Healthy Start supports research activities which benefit the health and well-being of Iowans. Healthy Start recognizes that conducting research for new insights and innovative solutions to health problems is one of the ten essential public health services. It is the mutual desire of Healthy Start and the Researchers to provide the researchers with limited access to Heathy Start records for the purpose of enabling the Researcher to implement the research protocol ("Study Protocol" Attachment 1) described in the University of Louisville Institutional Review Broad Application: IRB 22.0014 ("Outcome letter" Attachment 2).

II. Duties of the Parties.

A. Duties of Des Moines, Iowa Healthy Start. Following a review of the Application, Healthy Start has found the requested variables (Attachment 3) to be essential for the research project described, has found such project to be for bona fide research purposes, and has found that such project is not for private gain. Healthy Start therefore agrees to release to Researcher the requested limited data records in the Application.

B. Duties of Researcher. The Researcher agrees to the following:

(1) Use All records shall be used only for bona fide research purposes as set forth in the study protocol. The Researcher shall not use or permit others to use the data in anyway expect for statistical reporting and analysis.

A. No personally identifiable data provided. If Healthy Start has not provided Researchers with personally identifiable data, the Researcher shall not use nor allow anyone else to use the records to learn the identity of any person contained in the data provided. If the identity of any person is discovered inadvertently the Researchers will not make use of this knowledge; will immediately notify Healthy Start; will safeguard or destroy the information which led to the identification of the individual; and will inform no one else of the discovery.

B. **Personally identifiable data provided.** If Healthy Start has provided Researcher with personally identifiable data, such data or information from the records shall not be used to establish contact with the named person his/her family without prior written approval from Healthy Start.

(2) Storage All Healthy Start Records received shall be stored in a secure locked area with access restricted to project personnel for research purposes only set forth in the Study Protocol.

(3) Confidentially The Researchers shall maintain the confidentiality of all Records obtained from Healthy Start. The Researcher shall not disclose any confidential information contained in the records, including but not limited to names and other identifying information of persons who are the subject of such record, either during the period of this Agreement or hereafter. All identifiable and personal indicators shall be kept strictly confidential and shall not be used or released for any purpose.

The Researcher shall provide to Healthy Start a written description of procedures to safeguard confidential information. The research shall designate one individual who shall remain the responsible authority in charge of all the data records collected or used by the Researcher in connection with this Agreement.

Information from Healthy Start Records shall not be used to establish contact with the named person or his/her family without prior written approval from Healthy Start.

This Agreement requires that the organization will ensure the confidentiality of the Healthy Start Records it may provide to a sponsoring agency.

The Researcher shall immediately report to Healthy Start any unauthorized disclosure of confidential information. Such disclosure shall be grounds for immediate termination of Agreement.

(4) Destruction All data received from Healthy Start shall be destroyed at the termination of the research project unless need for further retention is explained in the project description and approved by University of Louisville IRB and Healthy Start through an addendum to this Agreement. Destruction shall be by means which render the records unidentifiable and useless. The Researchers should provide notification to Healthy Start of this destruction of the records.

(5) Future Requests All future records requested, relative to the described project, shall make reference to the above agreement number.

(6) Modifications If during the research study, there is a modification to the project or if the project is terminated notice shall be sent to Healthy Start explaining the modifications or stating date of termination. All modifications will undergo review through the University of Louisville Institutional Review Board prior to notice and implementation to Healthy Start. The Researcher shall not modify the use of Records from that contained in the Study Protocol without prior written approval from Healthy Start.

(7) Ownership Data Records provided by Healthy Start to the Researcher pursuant to this Agreement shall remain the property of Healthy Start at all times.

(8) Publication If the Researchers is associated with an Iowa regent institution, the Researchers agrees to comply with the conditions regarding publications and presentations contained in Section 8(b)"i" of the General Conditions for Contracts with States Universities, effective August 25, 2004. If the Researchers is not associated with an Iowa regent institution, the Research agrees to provide a copy of the proposed publication to Healthy State prior to dissemination date. The publication shall not be published in any format without the prior notification to Healthy Start.

III. Material Breach, Enforcement and Termination

A. Term. This Agreement shall be effective as of the Agreement Effective Date and shall continue until the Agreement is terminated in accordance with the provisions below or the Agreement between the parties terminates].

B. Covered Entity's Rights of Access and Inspection. From time to time upon reasonable notice, or upon a reasonable determination that the Researcher has breached this Agreement, Healthy Start may inspect the facilities, systems, books, and records of the Researcher to monitor compliance with this Agreement. The fact that Healthy Start inspects, or fails to inspect, or has the right to inspect, Researcher's facilities, systems and procedures does not relieve the Researcher of its responsibility to comply with this Agreement, nor does Healthy Start's (1) failure to detect or (2) detection of, but failure to notify the Researcher, any unsatisfactory practices constitute acceptance of such practice or a waiver of Covered Entity's enforcement or termination rights under this Agreement.

C. Termination. Healthy Start may terminate this Agreement:

(1) immediately if Researcher is named as a defendant in a criminal proceeding for a violation of HIPAA or the HIPAA Regulations;

(2) immediately if a finding or stipulation that Research has violated any standard or requirement of HIPAA, the HIPAA Regulations, or any other security or privacy laws is made in any administrative or civil proceeding in which Research has been joined; or

(3) immediately in the event Researcher's funding to support this project is terminated, Researcher must provide evidence of such loss of funding upon request of Healthy Start.

D. Remedies. If Healthy State determines that Research has breached or violated a material term of this Agreement, Healthy Start may, at its option, pursue any and all of the following remedies:

(1) exercise any of its rights of access and inspection under Section III.B. of this agreement;

(2) take any other reasonable steps that, in its sole discretion, shall deem necessary to cure such breach or end such violation; and/or

(3) terminate this Agreement immediately.

E. Knowledge of Non-Compliance. Any non-compliance by Researcher with this Agreement or with HIPAA or the HIPAA Regulations automatically will be considered a breach or violation of a material term of this Agreement if Research knew or reasonably should have known of such non-compliance and failed to immediately take reasonable steps to cure the non-compliance.

F. Injunctions. Healthy Start and Researcher agree that any violation of the provisions of this Agreement may cause irreparable harm. Accordingly, in addition to any other remedies available, in the event of any violation by the Researcher of any of the provisions of this Agreement, or any explicit threat thereof, Healthy Start shall be entitled to an injunction or other decree of specific performance with respect to such violation or explicit threat thereof, without any bond or other security being required and without the necessity of demonstrating actual damages. The parties' respective rights and obligations under this section shall survive termination of the Agreement.

G. Indemnification. Researcher shall indemnify, hold harmless and defend Healthy Start from and against any and all claims, losses, liabilities, costs and other expenses resulting from, or relating to, the acts or omissions of Researcher in connection with the representations, duties and obligations of Researcher under this Agreement. The parties'

respective rights and obligations under this section shall survive termination of the Agreement.

IV. Miscellaneous Terms.

A. State Law. Nothing in this Agreement shall be construed to require Researcher to use or disclose the Limited Data Records without a written authorization from an individual who is a subject of the PHI from which the Limited Data Records were created, or written authorization from any other person, where such authorization would be required under state law for such use or disclosure.

B. No Third-Party Beneficiaries. Nothing express or implied in this Agreement is intended or shall be deemed to confer upon any person other than Healthy Start and Researcher, and their respective successors and assigns, any rights, obligations, remedies, or liabilities.

C. Ambiguities. The parties agree that any ambiguity in this Agreement shall be resolved in favor of a meaning that complies and is consistent with applicable law protecting the privacy, security and confidentiality of Protected Health Information and the Limited Data Records, including, but not limited to, HIPAA and the HIPAA Regulations.

D. Primacy. To the extent that any provisions of this Agreement conflict with the provisions of any other agreement or understanding between the parties, this Agreement shall control with respect to the subject matter of this Agreement.

V. Execution

IN WITNESS WHEREOF, in consideration of the mutual covenants set forth above and for other goods and valuable consideration, the receipt, adequacy and legal sufficiency of which are hereby acknowledge, the parties have entered into the above Agreement and have caused their duly authorized representative to execute this Agreement.

APPENDIX F: Study Instrument

Please answer the following questions about yourself.

1. Regarding your race, do you self-identify as Black?

   ____ Yes ____No

2. Are you 18 years or older?

   ____ Yes ____No

3. Are you a mother of at least one live birth (Are you a mother of at least one living child who is not a twin and/or triplet)?

   ____ Yes ____No

4. Are you currently enrolled in the Des Moines, Iowa Healthy Start Program?

   ___ Yes ___ No
   If no, have you previously been enrolled in the program? (Y or N)

If participants mark "no" to any of the above questions, they will not be eligible to participant

5. Were you born in the United States of America?

   ____ Yes ____No

If participant click "YES" to question 5, go to Section 2 of the survey.

If participant click "NO" to question 5, proceed to questions 6-9 then to Section 2.

6. What country were you born in?

7. What year did you move to the United States

8. How old where you when you moved to the United States?

9. How many years have you lived in the United States?

Section 2.

First Name_____ Last Name _____

Date of Birth _____

Please go to Section 3

Section 3. Perceived Stress (Cohen, 1994)

The following questions will ask you about your feelings and thoughts during the last month. For each statement, you will indicate how often you felt or thought a certain way.

0= Never 1=Almost Never 2=Sometimes 3= Fairly Often 4= Very Often

	0	1	2	3	4
1. In the last month, how often have you been upset because of something that happened unexpectedly?					
2. In the last month, how often have you felt that you were unable to control the important things in your life?					
3. In the last month, how often have you felt nervous or "stressed"?					
4. In the last month, how often have you felt confident about your ability to handle your personal problems?					
5. In the last month, how often have you felt that things were going your way?					
6. In the last month, how often have you found that you could not cope with all the things you had to do?					
7. In the last month, how often have you been able to control irritations in your life?					
8. In the last month, how often have you felt that you were on top of things?					

9. In the last month, how often have you been angered because of things that were outside of your control?					
10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?					

Please go to Section 4.

Section 4. Experience of Racial Microaggressions
Racial microaggressions are define as brief and commonplace daily verbal, behavioral, and environmental humiliations, whether intentional or unintentional, that communicate hostile, offensive, or negative racial slights and insults to target a person or group.

The following questions will ask you how often a statement has occurred in your life. If the statement has occurred in your life, then indicate how bothersome/stressful the experience was for you.

Q1. Because of my race, other people assume that I am a foreigner.

Never__ A little/rarely__ Sometimes/moderate__ Often/frequently__

1a. How stressful, upsetting, or bothersome was this experience for you.

Not at all__ A little__ Moderate__ High__

Q2. Because of my race, people suggest that I am not a "true" American.

Never__ A little/rarely__ Sometimes/moderate__ Often/frequently__

2a. How stressful, upsetting, or bothersome was this experience for you.

Not at all__ A little__ Moderate__ High__

Q3. Other people often ask me where I am from, suggesting that I don't belong.

Never__ A little/rarely__ Sometimes/moderate__ Often/frequently__

3a. How stressful, upsetting, or bothersome was this experience for you.

Not at all__ A little__ Moderate__ High__

Q4. Other people treat me like a criminal because of my race.

Never__ A little/rarely__ Sometimes/moderate__ Often/frequently__

4a. How stressful, upsetting, or bothersome was this experience for you.

Not at all__ A little__ Moderate__ High__

Q5. People act like they are scared of me because of my race.

Never__ A little/rarely__ Sometimes/moderate__ Often/frequently__

5a. How stressful, upsetting, or bothersome was this experience for you.

Not at all__ A little__ Moderate__ High__

Q6. Others assume that I will behave aggressively because of my race.

Never__ A little/rarely__ Sometimes/moderate__ Often/frequently__

6a. How stressful, upsetting, or bothersome was this experience for you.

Not at all__ A little__ Moderate__ High__

Q7. I am singled out by police or security people because of my race.

Never__ A little/rarely__ Sometimes/moderate__ Often/frequently__

7a. How stressful, upsetting, or bothersome was this experience for you.

Not at all__ A little__ Moderate__ High__

Q8. People suggest that I am "exotic" in a sexual way because of my race.

Never__ A little/rarely__ Sometimes/moderate__ Often/frequently__

8a. How stressful, upsetting, or bothersome was this experience for you.

Not at all__ A little__ Moderate__ High__

Q9. Other people view me in an overly sexual way because of my race.

Never__ A little/rarely__ Sometimes/moderate__ Often/frequently__

9a. How stressful, upsetting, or bothersome was this experience for you.

Not at all__ A little__ Moderate__ High__

Q10. Other people hold sexual stereotypes about me because of my racial background.

Never__ A little/rarely__ Sometimes/moderate__ Often/frequently__

10a. How stressful, upsetting, or bothersome was this experience for you.

Not at all__ A little__ Moderate__ High__

Q11. Other people act as if they can fully understand my racial identity, even though they are not of my racial background.

Never__ A little/rarely__ Sometimes/moderate__ Often/frequently__

11a. How stressful, upsetting, or bothersome was this experience for you.

Not at all__ A little__ Moderate__ High__

Q12. Other people act as if all the people of my race are alike.

Never__ A little/rarely__ Sometimes/moderate__ Often/frequently__

12a. How stressful, upsetting, or bothersome was this experience for you.

Not at all__ A little__ Moderate__ High__

Q13. Others suggest that people of my racial background get unfair benefits.

Never__ A little/rarely__ Sometimes/moderate__ Often/frequently__

13a. How stressful, upsetting, or bothersome was this experience for you.

Not at all__ A little__ Moderate__ High__

Q14. Others assume that people of my background would succeed in life if they simply worked harder.

Never__ A little/rarely__ Sometimes/moderate__ Often/frequently__

14a. How stressful, upsetting, or bothersome was this experience for you.

Not at all__ A little__ Moderate__ High__

Q15. Other people deny that people of my race face extra obstacles when compared to Whites.

Never__ A little/rarely__ Sometimes/moderate__ Often/frequently__

15a. How stressful, upsetting, or bothersome was this experience for you.

Not at all__ A little__ Moderate__ High__

Q16. Other people assume that I am successful because of affirmative action, not because I earned my accomplishments.

Never__ A little/rarely__ Sometimes/moderate__ Often/frequently__

16a. How stressful, upsetting, or bothersome was this experience for you.

Not at all__ A little__ Moderate__ High__

Q17. Others hint that I should work hard to prove that I am not like other people of my race.

Never__ A little/rarely__ Sometimes/moderate__ Often/frequently__

17a. How stressful, upsetting, or bothersome was this experience for you.

Not at all__ A little__ Moderate__ High__

Q18. Others suggest that my racial heritage is dysfunctional or undesirable.

Never__ A little/rarely__ Sometimes/moderate__ Often/frequently__

18a. How stressful, upsetting, or bothersome was this experience for you.

Not at all__ A little__ Moderate__ High__

Q19. Others focus only on the negative aspects of my racial background.

Never__ A little/rarely__ Sometimes/moderate__ Often/frequently__

19a. How stressful, upsetting, or bothersome was this experience for you.

Not at all__ A little__ Moderate__ High__

Q20. Others prefer that I assimilate to the White culture and downplay my racial background.

Never__ A little/rarely__ Sometimes/moderate__ Often/frequently__

20a. How stressful, upsetting, or bothersome was this experience for you.

Not at all__ A little__ Moderate__ High__

Q21. I am mistaken for being a service worker or lower-status worker simple because of my race.

Never__ A little/rarely__ Sometimes/moderate__ Often/frequently__

21a. How stressful, upsetting, or bothersome was this experience for you.

Not at all__ A little__ Moderate__ High__

Q22. I am treated like a second-class citizen because of my race.

Never__ A little/rarely__ Sometimes/moderate__ Often/frequently__

22a. How stressful, upsetting, or bothersome was this experience for you.

Not at all__ A little__ Moderate__ High__

Q23. I receive poorer treatment in restaurants and stores because of my race.

Never__ A little/rarely__ Sometimes/moderate__ Often/frequently__

23a. How stressful, upsetting, or bothersome was this experience for you.

Not at all__ A little__ Moderate__ High__

Q24. Sometimes I feel as if people look past me or don't see me as a real person because of my race.

Never__ A little/rarely__ Sometimes/moderate__ Often/frequently__

24a. How stressful, upsetting, or bothersome was this experience for you.

Not at all__ A little__ Moderate__ High__

Q25. I feel invisible because of my race.

Never__ A little/rarely__ Sometimes/moderate__ Often/frequently__

25a. How stressful, upsetting, or bothersome was this experience for you.

Not at all__ A little__ Moderate__ High__

Q26. I am ignored in school or work environments because of my race.

Never__ A little/rarely__ Sometimes/moderate__ Often/frequently__

26a. How stressful, upsetting, or bothersome was this experience for you.

Not at all__ A little__ Moderate__ High__

Q27. My contributions are dismissed or devalued because of my racial background.

Never__ A little/rarely__ Sometimes/moderate__ Often/frequently__

27a. How stressful, upsetting, or bothersome was this experience for you.

Not at all__ A little__ Moderate__ High__

Q28. When I interact with authority figures, they are usually of a different racial background.

Never__ A little/rarely__ Sometimes/moderate__ Often/frequently__

28a. How stressful, upsetting, or bothersome was this experience for you.

Not at all__ A little__ Moderate__ High__

Q29. I notice that there are few role models in my racial background in my chosen career.

Never__ A little/rarely__ Sometimes/moderate__ Often/frequently__

29a. How stressful, upsetting, or bothersome was this experience for you.

Not at all__ A little__ Moderate__ High__

Q30. Sometimes I am the only person of my racial background in my class or workplace.

Never__ A little/rarely__ Sometimes/moderate__ Often/frequently__

30a. How stressful, upsetting, or bothersome was this experience for you.

Not at all__ A little__ Moderate__ High__

Q31. Where I work or go to school, I see few people of my racial background.

Never__ A little/rarely__ Sometimes/moderate__ Often/frequently__

31a. How stressful, upsetting, or bothersome was this experience for you.

Not at all__ A little__ Moderate__ High__

Q32. I notice that there are few people of my racial background on the TV, books, and magazines.

Never__ A little/rarely__ Sometimes/moderate__ Often/frequently__

32a. How stressful, upsetting, or bothersome was this experience for you.

Not at all__ A little__ Moderate__ High__

Q33. Have you ever experienced prejudice and/or discrimination because of your race before living in the United States?

Never__ A little/rarely__ Sometimes/moderate__ Often/frequently__

33a. How stressful, upsetting, or bothersome was this experience for you?

Not at all__ A little__ Moderate__ High__

THANK YOU FOR COMPLETING THIS SURVEY!

If you have questions, please contact
Kendria Kelly-Taylor
Kendria.kelly-taylor@louisville.edu

APPENDIX G: INFORMED CONSENT

ARE THERE DIFFERENCES IN BIRTH OUTCOMES BETWEEN FOREIGN-BORN AND US-BORN BLACK MOTHERS? THE ROLE OF PERCEIVED RACIAL DISCRIMINATION, PRETERM BIRTH, AND SMALL FOR GESTATIONAL AGE.

Dear Participant:

You are being invited to participate in a research study. The purpose of this study is to: (1) determine if perceived racial discrimination is associated with birth outcomes, preterm birth and small for gestational age among foreign-born and US-born Black women, (2) better understand how foreign-born and US-born Black women report experiences of racial discrimination and other related stressors, and (3) determine if length of residency in the US influence the reporting of these experiences This study is conducted by Dr. Anne Wallis and Kendria Kelly-Taylor of the University of Louisville in collaboration with Des Moines, Iowa Healthy Start.

Your participation in the study will involve completing a survey about your experiences of racial discrimination. The study will take approximately 10 -15 minutes to complete. Risk to individual participants is minimal. Time to complete the survey may cause an inconvenience to your schedule. Participants my experience some discomfort from the survey questions. The information you provide will further our understanding of the role of perceived racial discrimination and birth outcomes among Black women and support the development of culturally appropriate interventions and structural/policy changes that target these risk factors. Your information will be stored using an online secure database on a password protected computer. The information collected may not benefit you directly. The information learned in this study may be helpful to others.

Individuals from the Des Moines, Iowa Healthy Start Program, the Institutional Review Board (IRB) and Human Subjects Protection Program Office (HSPPO) at the University of Louisville, and other regulatory agencies may inspect these records. In all other respects, however, the data will be held in confidence to the extent permitted by law. Should the data be published, your identity will not be disclosed.

If you participate in this study, identifiable information such as your name or date of birth may be removed from the information collected in this study. After removal, the information may be used for future research or shared with other researchers without additional consent from you.
In this study we will use your name and date of birth along with your health information relevant to this study such as birthweight of live birth, maternal age, and income. We will

keep this data safe by storing data on a password protected computer accessible by study personals and we will destroy all identifiers when they are no longer needed for the study.

Each study participant will receive $10 dollars in the form of Stork's Nest points for their participation in the study. This amount equates to 200 Stork's Nest points (i.e., 1 dollar =20 points). Points can be redeemed to earn new, unused infant and child health products.

Taking part in this study is voluntary. By answering survey questions, you agree to take part in this research study. You do not have to answer any questions that make you uncomfortable. You may choose not to take part at all. If you decide to be in this study, you may stop taking part at any time. You will not lose any benefits for which you may qualify.

If you have any questions, concerns, or complaints about the research study, please contact: Kendria Kelly-Taylor at (404) 617-9153 or kendria.kelly-taylor@louisville.edu

If you have any questions about your rights as a research participant, you may call the Human Subjects Protection Program Office at the University of Louisville at (502) 852-5188. You can discuss any questions about your rights as a research participant, in private, with a member of the Institutional Review Board (IRB). The IRB is an independent committee made up of people from the University community, staff of the institutions, as well as people from the community not connected with these institutions. The IRB has reviewed this research study.

If you have concerns or complaints about the research or research staff and you do not wish to give your name, you may call 1-877-852-1167. This is a 24-hour hot line answered by people who do not work at the University of Louisville.

If you wish to proceed to the survey, click "NEXT".

Sincerely,
Kendria Kelly-Taylor

CURRICULUM VITAE

Kendria Kelly-Taylor

EDUCATION

Ph.D. University of Louisville, Public Health — Aug 2018-Present
Concentration: Epidemiology
Dissertation: "*Are there differences in birth outcomes between Foreign-born and US-born Black mothers? The role of perceived racial discrimination, preterm birth, and small for gestational age."*
Committee: Dr. Anne Wallis (chair)

MSPH Meharry Medical College — May 2018
Master of Science in Public Health
Thesis*: "The Relationship between Knowledge, Attitude, Culture, and African American Male College Students' Intention to Receive the Human Papillomavirus Vaccine."*
Committee: Dr. Leah Alexander (chair)

BS Purdue University, Movement and Sports Science — May 2014

RESEARCH EXPERIENCE

University of Louisville — Jan 2021-Present
Title: Fighting Injustices Among African American Youth HIV Testing Project
Principal Investigator: Dr. Jelani Kerr

- Collaborate with community organizations for study recruitment of over 300 African American young adults 18-24 years old
- Create tailored participant retention strategies and materials
- Implement sexual health and HIV prevention workshops for community-based organization

- Collect baseline, 12-month, and 24-month post-test data using Audio Computer Assisted Self Interview
- Lead quantitative analysis on research examining the association between HIV knowledge, HIV prevention, racial discrimination, and incarceration status among African American young adults

University of Louisville July 2022-Present
Title: Racial Trauma & Healthcare Advocacy Study
Principal Investigator: Dr. Emma Sterrett-Hong

- Develop content and resource materials for healthcare advocacy sessions

University of Louisville Jun 2019-Aug 2019
Title: A Hopeful Future: Using photovoice to depict hope and an equitable future in various U.S. communities
Principal Investigator: Dr. Aisha Brown

- Applied community-based participatory research methods to create and host a photovoice exhibition in collaboration with Kentucky Humana Foundation and nine community-based organizations
- Conducted thematic analysis using Attribute, NVivo, and Value coding
- Assisted in the development of a manuscript for peer-review publication

Meharry-Vanderbilt Alliance, Meharry Medical College Dec 2016-Aug 2019
Project 1: Assessing Views of the Immunization Neighborhood to Help Improve HPV Vaccination Rates
Principal Investigator: Dr. Jennifer Cunningham-Erves

- Assisted in recruitment of community partners, scheduling and conducting interviews, data analysis, development of intervention and manuscript

Project 2: Vanderbilt Ingram Cancer Center Education Pilot
Principal Investigator: Dr. Jennifer Cunningham-Erves

- Designed, implemented, and evaluated a community-informed public health intervention among underrepresented populations

Project 3: Comparative Effectiveness Study of Patient-Centered Interventions to Improve HPV vaccine Rates among African American Adolescents
Principal Investigator: Dr. Jennifer Cunningham-Erves

- Interviewed key stakeholders to understand their knowledge and perception of HPV and the HPV vaccine
- Assisted in grant writing and development of a manuscript

TEACHING EXPERIENCE

University of Louisville Jan 2019-May 2022

Global Public Health PHEP 301
Co-Instructor/ Teaching Assistant

- Taught Global Public Health, a general education undergraduate course for 7 semesters, with an average of 65 students per semester
- Designed course content and lecture material covering topics including but not limited to: demographic/epidemiologic transition, conflict, human rights abuses, migration, and social factors that contribute to the distribution of disease.
- Developed and graded quizzes, exams, and discussion assessments
- Created syllabus to meet accreditation standards

University of Louisville Jan 2019-May 2022
Foundation of Global Maternal and Child Health PHPH 615
Child Health and Development PHPH 625
Teaching Assistant, Department of Epidemiology

- Assisted professor in classroom instruction and course implementation in two master's-level courses
- Taught lectures on maternal and child health topics specific to Black Reproductive and Perinatal health

Meharry Medical College Aug 2017-May 2018
Epidemiology I MSPH7001& Epidemiology II MSPH 71401
Teaching Assistant

- Assisted professor in classroom instructions
- Proctored student examinations
- Addressed topics in epidemiology related to application and interpretation of fundamental terminology, calculating and interpreting disease frequency, and study design application
- Instructed two class sessions on epidemiologic measures of association

EMPLOYMENT EXPERIENCE

Communicable Disease Investigator Jun 2020-Present
North Central District Health Department, Shelbyville, KY

- Conduct interviews with COVID-positive cases located in Shelby, Spencer, Trimble, and Henry County, Kentucky
- Educate and inform COVID-cases and their close contacts about CDC isolation and/or quarantine guidelines to follow based on assessment interview
- Complete daily follow-ups for each case and record disease progression during the set isolation period
- Import and manage state and county COVID data using the National Electronic Disease Surveillance System

Community Health Educator Mar 2018-Apr 2020
Vanderbilt Ingram Cancer Center, Nashville, TN

- Created culturally tailored educational presentations for community partners about the racial disparities in cancer diagnosis and treatment
- Educated community members on clinical trial participation
- Evaluated the effectiveness of outreach educational programs

Customer Service Manager Aug 2014-May2017
Hobby Lobby, Snellville, GA/Nashville, TN

- Trained employees on company policies, merchandise, and monetary transaction protocol
- Resolved customer inquiries and manage customer concerns

RESEARCH GRANTS

Funded:
Graduate Student Council Research Grant
2/9/2022
Dissertation title: Are there differences in birth outcomes between foreign-born and US-born Black mothers? The role of perceived racial discrimination, preterm birth, and small for gestational age.
$500 direct/ 1yr
Role: Principal Investigator

Office of Community Engagement Gheens Mini-grant Program
9/19/2022
Project title: Exploring the perceptions of fatherhood engagement as it relates to maternal and child health outcomes within underserved communities in Louisville, KY.
Requested $718.40 direct/ 5 months
Role: Principal Investigator

PUBLICATIONS

Journal Publications

Cunningham-Erves, J.C., Deakings, J., Mayo-Gamble, T.L., **Kelly-Taylor, K**., Miller, S. (2019). Factors Influencing Parental Trust in Medical Researchers for Child and Adolescent Patients' Clinical Trail Participation. *Psychology, Health & Medicine,* 24(6), 691-702.

Cunningham-Erves, J.C., **Kelly-Taylor, K**., Mayo-Gamble, T.L., Deakings, J., Forbes, L.(2018). A Physician's Recommendation for HPV vaccination: What makes African American Mothers compliant? *The Pediatric infectious disease journal,* 37(8), 222-225.

Cunningham-Erves, J.C., Forbes, L., Ivankova, N., Mayo-Gamble, T., **Kelly-Taylor, K**., Deakings, J. (2018) Black mother's intention to vaccinate daughters

against HPV: A mixed methods approach to identify opportunities for targeted communication. *Gynecologic Oncology*, 149(3), 506-512.

Conference Presentation

(Abstract-Accepted)

Kelly-Taylor, K., Smith, A.B., Earnshaw, V., Turan, J., DiClemente, R., LaJoie, S., Rai, S.N., Burton, K., Deakings, J., Bullock, N., and Kerr, J. (2022). The Difference in HIV knowledge: A Comparative Analysis between Formerly Incarcerated and Non-justice Involved African American Youths.
Oral Presentation at American Public Health Association Conference, Boston, MA, November 2022.

Smith, A.B., Earnshaw, V., Turan, J., DiClemente, R., LaJoie, S., Rai, S.N., Burton, K., **Kelly-Taylor, K**., Deakings, J., Bullock, N., and Kerr, J. (2022). Examining the relationship between incarceration status and endorsement of HIV stereotypes among African American youth in Louisville, KY.
Oral Presentation at American Public Health Association Confernce, Boston, MA, November 2022.

Kelly-Taylor, K., Deakings, J., Story, A., Elmore, S., Bullock, N., Brown, A., Kelly-Pryor, B. (2022). A hopeful future: Using photovoice to depict hope and an equitable future in various U.S. communities.
Poster presentation at Kentucky Public Health Association Conference, Bowling Green, KY, April 20-22, 2022

Deakings, J.A., Burton, K., Smith, A.B., **Kelly-Taylor, K.,** Bullock, N., Kerr, J. (2022). Fight the Stigma: Translational HIV Education for African Americans through Art**.**
Poster presentation at Kentucky Public Health Association Conference, Bowling Green, KY, April 20-22, 2022

Kelly-Taylor, **K**. Alexander, L., Brown, V., Cunningham-Erves, J. (2018). The Relationship between Knowledge, Attitude, Culture, and African American Male College Students' intention to receive the Human Papillomavirus Vaccine.
Poster Presentation at 2019 Kentucky Public Health Association Conference, Covington, KY.

Kelly-Taylor, K., Cunningham-Erves, J., Mayo-Gamble, T., Deakings, J. (2017). Factors Associated with African American mothers being more likely to comply with a physician's recommendation for the HPV vaccination.
Poster presentation at 2017 American Public Health Association Conference, Atlanta, GA.

Deakings, J., Cunningham-Erves, J., Mayo-Gamble, T., **Kelly-Taylor, K**. (2017).

Factors influencing Parental Trust in Medical Researchers for Adolescent Participation in Clinical Trials.
Poster Presentation at 2017 American Public Health Association Conference, Atlanta, GA.

PRESENTATIONS AND INVITED LECTURES

Seminar Presentation
Lecture Title: The Field of Epidemiology: From Cholera to COVID
Public Health Seminar Series: UofL School of Public Health and Information Sciences, November 18, 2020.

Guest Lecture
Lecture Presentation: Black Women's Reproductive Health: Racial Discrimination, Epigenetics, and Birth outcomes
Social and Behavioral Foundations of Public Health, March 3, 2021.

PROFESSIONAL AFFILIATIONS

Society for Epidemiologic Research, 2021-Present

Kentucky Public Health Association, 2019-Present

American Public Health Association, 2017-Present

PROFESSIONAL SERVICE

American Public Health Association
Abstract reviewer for Maternal and Child Health Section [2022 Annual Conference]

Black Graduate and Professional Student Association
University of Louisville
Communication Coordinator [Jan 2022-Present]

Graduate School Student Ambassador
University of Louisville [Aug 2021-Present]

Graduate Student Council
University of Louisville
Graduate Student Representative [2019-2021]

Division of Public Health Practice Student Association
Meharry Medical College
Treasurer [Jan 2017-May 2018]

COMMUNITY PARTNERSHIPS

Healthy Start/ Empowerment Initiative, Des Moines, Iowa Jan 2023-Present
Project: Risk Assessment Questionaries

- Conduct a review of the literature to identify risk assessment measures for pregnancy, childbirth, and the postnatal period
- Create a new evidence-based risk assessment tool to be administered to healthy start clientele

Healthy Start/Empowerment Initiative, Des Moines, Iowa June 2022-Aug 2022
Black Mothers Prenatal Workshop
Role: Course Evaluator

- Developed weekly evaluation merits to assess knowledge and skill development in areas related to childbirth, labor and delivery, and pre/postnatal care

SERVICE AND INVOLVEMENT

Goodwill Kentucky
Presenter, Louisville, KY, 2021-present

- Provide biweekly comprehensive sexual health education presentation to young adults participating in Goodwill's Reintegrating Individuals Successfully Every Day (RISE) program

Salt Wagon Community Clinic
Clinic Coordinator, Nashville, TN, 2017-2018

- Trained student volunteers on clinic operations and protocol
- Scheduled patient appointments using an electric health record

HONORS AND AWARDS

2023 Graduate Student Excellence in Teaching Award April 2023
University of Louisville

2023 Outstanding Community Engagement Award
University of Louisville March 2023

Diversity Fellow Aug2019-May2021
University of Louisville

School of Public Health and Information Sciences Student of the Month Feb 2020
University of Louisville

Master of Science in Public Health Academic Achievement Award May 2017

Meharry Medical College

Dean List May 2017
Meharry Medical College

Outstanding Second Year, Master of Science in Public Health Award May 2017
Meharry Medical College

Black Cactus Award May 2014
Purdue University

STATISTICAL SKILLS

Applications: Statistical Analysis System 9.4, Statistical Packages for Social Sciences