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Abstract

The United States has one of the highest rates of infant mortality in the developed world. Studies indicate infant mortality varies greatly across racial groups. Black women are twice as likely to report preterm birth or infant death relative to White women. Foreign-born Black women have similar rates to that of native-born White women rather than native-born Black women, suggesting the link between race and reproductive health is more complex than previously understood. Thus, this study examines the interplay between nativity, race, and reproductive health. The cumulative disadvantage perspective has been employed to better unpack how life course stressors may be negatively linked to reproductive health outcomes of native-born Black women relative to the foreign-born. The National Longitudinal Study of Adolescent and Adult Health was utilized to examine if a woman's nativity is associated with their reproductive health outcomes based on unique life course stressors they may have endured. These findings from this study suggests that both nativity status and race are key to better understanding adverse birth outcomes.

Introduction

In 2005, the United States ranked 30th in the world for infant mortality coming in behind many similarly developed countries including most European countries, Canada, Australia, and Israel. For a country that boasts some of the most advanced medical technology in the world, the United States seem to be falling short at protecting infants and mothers (MacDorman, 2011). So that begs the question of why is this disparity occurring? What is the driving force behind such a wide health-related disparity in what is considered one of the most technologically advanced countries in the world?

This study focuses on nativity's link to infant mortality disparities between different racial and ethnic groups. Multiple studies have explored some aspects of the racial infant mortality disparity. All of these studies have found that the population with the highest rates of infant mortality in the USA is Black Americans. Studies have found that the higher infant mortality rates of Black Americans can be attributed to higher rates of preterm birth and lower birthweight related deaths (Latinsky, 2019; MacDorman, 2011; Parker Dominguez, et. al, 2009; Rosenthal & Lobel, 2011). Of the few studies that have investigated nativity's relationship with pregnancy outcomes, all have shown a relatively better pregnancy outcome for foreign-born women when compared to native-born women. This holds true across all racial and ethnic groups (Almeida, Mulready-Ward, Bettegowda, & Ahluwalia, 2013; Pallotto, Collins, & David, 2000; Parker-Dominguez, et al., 2009).

Nonetheless, the link between race, nativity and reproductive health remains poorly understood. Thus, this study will focus on adverse birth outcomes disparities between nativity statuses and across racial groups, focusing on Black Americans. Specifically, how can racial and ethnic reproductive health disparities be viewed differently through the lens of nativity? For instance,

research suggests foreign-born Black Americans have infant mortality rates closer to those of native-born White Americans compared to their native-born Black American counterparts. Yet when comparing native-born Black Americans and native-born White Americans, studies suggest there are significant gaps in infant mortality, with native-born Black Americans at greater risk than their White American counterparts. Researchers have been unable to identify what accounts for infant mortality disparities between native-born and foreign-born Black Americans. Since there is limited research on nativity status and reproductive health, specifically when addressing the Black American infant mortality disparity, this study will contribute to current research through using data from the National Longitudinal Study of Adolescent to Adult Health (Add Health) to examine how nativity status and race are related to adverse birth outcomes.

A link between nativity status and adverse birth outcomes could indicate a systematic issue within the United States healthcare system and could also point toward how certain social factors unique to the United States could be affecting citizens health over their life course. A link between race and infant mortality disparities would further support that the United States healthcare system has biases against certain groups and the culture within healthcare may be benefiting specific social groups over others. This study could bring light to what kind of structural issues our society has especially when accounting for discrimination, prejudice, and inequalities that are stacked against certain social groups. Both infant and maternal mortality are considered the mirrors of societal health and such a high disparity in infant health outcomes suggests that the United States is failing to protect the health of all citizens, despite social group membership. Further, having such a high infant mortality rate in the Black American population shows that the Black American population is disproportionately affected by this lack of health

security for infants and mothers. These types of implications about the United States cannot be ignored and therefore more in-depth research to better understand and begin making strides toward solutions is essential.

Background

Black American women suffer from far poorer reproductive health outcomes relative to women in all other racial or ethnic groups (MacDorman, 2011; Rosenthal & Lobel, 2011). This reproductive disadvantage highlights a disparity found within the healthcare system that focuses on the treatment of Black American mothers and infants, especially when compared to mothers and infants of all other races. The Black American reproductive disadvantage, in part, stems from a history of preventative measures and mistreatment of the reproductive rights of Black American women (Hamilton & Green, 2019; Parker Dominguez, et. al., 2009). The Black American population has historically been taken advantage of, lied to, and wrongfully experimented on as a whole. As a response to the violation of human rights after the multitude of unethical experimental studies and other questionable medical decisions made during the period of eugenics, policies and ethics boards were established in an attempt to mend the relationship between the Black American community and medical field, while also protecting rights of other marginalized groups. One way this can be seen is through the policies and ethic boards that are now established to protect people's rights after a multitude of unethical experimental studies and other questionable medical decisions were made during the period of eugenics. The healthcare system today still has race-related inequalities with Black Americans less likely to report quality healthcare and are more likely to be over diagnosed with mental health issues or other conditions (Smedley, Stith, & Nelson, 2002).

However, after the eugenics movement began fading into the background, this treatment did not cease. Specifically, through governmental aid programs and organizations using women's health as a disguise to promote a racist agenda, Black American women were misinformed about birth control methods and the corresponding consequences; they were wrongfully experimented on not only to test various birth controls, but also surgery techniques; and have been socially pressured and immorally persuaded to give up reproductive freedom. One particular way the medical field would take away reproductive freedom from Black Americans was through what was called a Mississippi Appendectomy. This was a procedure wherein women and girls would undergo a procedure for an appendectomy and come out without an appendix and a uterus. Medical professionals would illegally perform complete hysterectomies on Black American women without their knowledge, let alone their consent. This was not the only way in which reproductive rights of Black Americans were compromised. For over half a century the sterilization of women who were perceived as being connected to welfare was commonplace. In fact, today Mississippi has reported that one-third of their population of adult women have had hysterectomies. Of the women who have had hysterectomies, 57% were 65 and older. This is quite alarming considering this is just Mississippi's population and only accounts for one type of restriction on reproductive freedom— hysterectomies. This also does not account for all the ways in which reproductive rights were violated through legislation, biased recruitment for experimental studies, biased sex education, forced sterilizations, and much more (Washington, 2006).

These events have caused such a distrust between not only the medical field and the Black American population, but also between the Black American population and the government. This history has only further solidified systemic inequalities in the medical system. These systemic

inequalities can then become evident within the medical professionals who have been educated by a system and predecessors who operated under racially biased beliefs. Therefore, today, discriminatory beliefs are often implicitly engrained in some of the most important work related to human health. The continuation of these stereotypical and prejudice ideologies has unconsciously continued into present day as is apparent in maternal and infant mortality disparities.

Nevertheless, infant mortality disparities are not just a medical issue, but also a distinctive confluence of historical events and beliefs which have led to outcomes that are still present in the United States today. This results in an intersectional social issue that predominately Black American women face and occurs through a process explained by cumulative (dis)advantage. Poorer health outcomes are more common for Black Americans, which is believed to be the result of the disproportionate number of stressors experienced and accumulated over time. The cumulative (dis)advantage theory emphasizes how social factors and individual experiences can affect not only the present outcome, but also future outcomes and build over time. A person has a unique set of social factors that attribute to how many obstacles or what opportunities may be available to them over their life course and as time goes on these build upon each other until it can be characterized as a "load" that contributes to the overall outcome of that person's life. A person's gender, race, nativity status, sexuality, socioeconomic status, and education are a few social factors that can contribute to the health, wellbeing, and trajectory of that person's life (Dannefer, 2003).

Moreover, intersectional identities, such as holding more than one membership across groups like being a woman and Black, can increase a person's allostatic load. An allostatic load is the accumulation of stressors over a life course that contribute to the overall wellbeing of a person.

The allostatic load for Black women is unique; it stems from a lifetime of prejudice, discrimination, racism, and correspondingly the opportunities available to this social group. The opportunities available to Black women from the beginning of life may not be as abundant as those who belong to other groups. The opportunities for attainment of higher education, higher socioeconomic status, and more can affect the amount of social mobility available to a particular person. Decreased social mobility can then influence the likelihood of receiving quality healthcare, gaining higher levels of education attainment, and achieving higher socioeconomic status, among other social factors that can contribute to an individual's well-being. Consequently, this can lead to an increase in adverse birth outcomes that are not equal across racial groups or nativity status (Brewin & Nannini, 2014; Rosenthal and Lobel, 2011; Wallace et. al, 2013). This is evident in the Black American reproductive disadvantage wherein health outcomes of the foreign-born are more favorable than those of the native-born. Foreign-born Black American health outcomes have rates that are more alike to those of native-born White Americans than those of native-born Black American women (Parker Dominguez, et. al. 2009). These findings indicate this disparity may not be a direct result from the social construction of skin-colored racism. Rather, these results suggest that the social issue is rooted much deeper in the very structure of society, within the intersectional issues Black American women face from birth onward in the United States, specifically, rather than based on skin-colored racism. These social structures could include economic, familial, class, educational, and judicial structures in our society.

Previous Studies

Neighborhood concentration, educational attainment, socioeconomic status, age, and other social factors are often linked to both race, nativity status, as well as health outcomes, and thus, they will be accounted for in this study.

Education

Education level tends to be positively associated with health; however, past studies have shown that Black Americans with higher educational attainment have worse overall population health than White Americans who have low-educational attainment. Research has shown that due to life-course disadvantages uniquely experienced by native-born Black American women (which appear to heighten during the time of motherhood) despite having higher educational attainment have resulted in higher health risks and poorer outcomes (Brewin & Nannini, 2014; Rosenthal and Lobel, 2011; Wallace et. al, 2013). Infant mortality rates for Black American women is over two times those for White Americans. Infants born to Black American women have health disadvantages across all educational levels and a substantially higher rate of infant mortality relative to White American women (Kung, Hoyert, Xu, and Murphy, 2008). Furthermore, studies have revealed that Black American's education has a positive relationship with infant mortality. In fact, college educated Black American women have a 46% higher infant mortality rate than White American women with a high school degree or less (Fisherman et al., 2019).

Educational attainment is typically considered a protective factor against social stressors that can lead to more adverse health outcomes. Indeed, for all other racial groups higher educational attainment is linked to decreased infant mortality— but for Black American women, we see an opposing trend emerge. Black American women have a higher infant mortality rate across all educational levels relative to low-educated White American women (Fisherman, et al., 2019).

Therefore, it appears that the trend pertaining to higher educational attainment and lower risk of infant mortality does not apply to the Black American population.

Neighborhoods

Neighborhood can also be an important factor when examining health outcomes for expectant mothers. The educational attainment of a person is typically similar within the same neighborhood as school demographics are representative of the surrounding neighborhood. In the United States, student populations are based on district, which are drawn based on neighborhood lines. Studies have shown that Black women living in a racially integrated neighborhood, with higher socioeconomic status and educational attainment, had a greater risk of adverse birth outcomes (Mendez, Almario Doebler, Kim, Amutah, Fabio, & Bodnar, 2013). These women had significantly higher rates of adverse birth outcomes when compared to those of Black American women who lived in a predominately black neighborhoods with similar socioeconomic status and educational attainment. Which, again, would indicate a positive relationship between education and adverse birth outcomes when concerning Black American women. Furthermore, the surrounding neighborhood could have a bearing on the overall pregnancy outcome as health behaviors and resources are often homogeneous across neighborhoods. Racially integrated neighborhoods show higher rates of adverse birth outcomes which begs the question of why?

Previous research indicates that neighborhoods with lower socioeconomic status, including education, wealth, and income, would result in higher infant mortality rates. However, the infant mortality disparity between higher and lower education attainment Black Americans suggests otherwise. Previous research has also revealed a relationship between high levels of discrimination, prejudice, and oppression with poorer living conditions, lower educational attainment, and therefore lower socioeconomic status. Taken together, these factors could be

associated with poorer behavioral habits (i.e., higher risk of drinking, smoking, and a lower likelihood of going to the doctor), which could continue into the pregnancy and therefore consequently be associated with a higher risk pregnancy. Although it found that adolescent smoking was indeed more common in lower socioeconomic neighborhoods; it was much less common for adolescent Black Americans to smoke when that neighborhood had a higher concentration of Black Americans— especially among pregnany youth. Moreover, multiple studies have shown that White expectant mothers are more likely to smoke than Black expectant mothers— as well as have other poorer behavioral habits (Spriggs Madkour, Harville, & Xie, 2014). Higher risks of depression and other mental health issues were prevalent across multiple life stages for Black Americans. Depression and other mental health issues can have impacts on pregnancy as well (Brewin & Nannini, 2014; Nkansah-Amankra & Tettey, 2015; Spriggs Madkour, Harville, and Xie, 2014). One study even predicted that if Black American expectant mothers— at all educational levels— were to smoke at the same rate as White American expectant mothers with an educational level of a high school degree or less then the infant mortality disparity would be much wider in comparison (Fisherman, et al., 2019).

One aspect that further emphasizes the importance of neighborhood concentration is how neighborhoods are still rather segregated today. This segregation was due to previous laws that supported the forced movement of Black Americans into urban areas, like cities. This can be seen as a result of job opportunities presented to Black Americans post slavery (which were more often than not factory or industrial work) that could predominately be found in urban areas like cities. Another component was property owners in many states drafting restrictive covenants. Restrictive covenants were contracts and understandings between various property owners in the same neighborhoods that stated they would not allow Black Americans to live

there. Restrictive covenants were legal until 1948, and because of this, their consequences are still visible today, reflected in current demographics of many neighborhoods in larger cities. Neighborhoods of lower socioeconomic status and to some extent the rate of racial concentration have been linked with adolescent behaviors such as early sexual initiation, substance use, and delinquency (Spriggs Madkour, Harville, & Xie, 2014). This residential segregation is still being enforced after the abolishment of restrictive covenants through zoning laws, federal housing programs, and more based on systemic racism and discriminatory social structures. Pushing Black Americans to lower socioeconomic neighborhoods further hinders opportunities for education advancement, better healthcare, quality food access, and social support, among other benefits (Mehra, et al, 2019). Despite studies showing that there is a positive correlation between higher educational attainment and infant mortality, the history behind it is still relevant and necessary as there continues to be a relationship between the factors (Mendez et al., 2013).

This brings us to that of the demographic of the neighborhoods, schools, and corresponding healthcare facilities. Since the neighborhoods are still segregated as a result of past racist practices, schools are still segregated as a result. Although there were laws in place to prevent segregation based on race, what the law failed to take into account was how the schools allow students to enroll. Since neighborhoods were still segregated the school was therefore still segregated, too. The neighborhood demographics are a product of systemic racism, as lower-socioeconomic neighborhoods are predominately people of color. The neighborhood is therefore linked to educational attainment, which could lead to access of healthcare opportunities such as healthcare clinics, hospitals and other related resources. All of these components factor into the allostatic load over a person's life course.

Ethnic Enclaves and the Immigrant Health Paradox

Multiple studies have explored the concept of ethnic enclaves and the corresponding immigrant health paradox. Ethnic enclaves are predominately immigrant neighborhoods, that are dominated by people with similar racial and ethnic backgrounds. Ethnic enclaves are thought to have many benefits to immigrant groups (Villalonga-Olives, Kawachi, von Steinbuchel, 2016). By being immersed in a community of a similar racial and ethnic background, one is able to establish a stronger social capital, which could then limit their exposure to discrimination and potentially give them ways to overcome obstacles. The immigrant health paradox is thought to be a product of the benefits an ethnic enclave offers their residents. Researchers have found that immigrants typically have better health, especially reproductive health, relative to their native-born counterparts of the same race or ethnicity (Almeida, Mulready-Ward, Bettagouda, & Ahluwalia, 2013; Villalonga-Olives, Kawachi, von Steinbuchel, 2016).

One instance in which this is seen is between the native-born and foreign-born Black Americans, in which the foreign-born report better health outcomes overall compared to the foreign-born. One study theorized that the reason for the disparity between foreign-born Black Americans and native-born Black Americans was a result of immigrating from a country wherein they were the majority and therefore had a higher likelihood of greater personal, social, and cultural capital, resulting in greater social mobility (Waters, 1999). The longer the person resided in the United States, the more likely they were to be similar to native-born Black American in their reported health disparities. This suggests the unique set of inequalities and discrimination faced by native-born Black Americans contribute to a higher allostatic load that is linked to one's health outcomes, including reproductive health. The intersection of race, nativity, and gender throughout their life course creates a unique set of intersectional stressors that are heightened

during motherhood and therefore cause a higher risk for reproductive issues (Rosenthal and Lobel, 2011).

Adverse Birth Outcomes: Low Birthweight and Preterm Birth

As previously stated, foreign-born Black Americans have similar infant mortality rates to that of native-born White Americans. Multiple studies have uncovered this association, and the number of risk factors for foreign-born Black Americans were significantly lower across multiple factors when compared to their native-born counterparts (Green & Hamilton, 2019; Parker-Dominguez et al., 2009; Singh & Yu, 1996). There are multiple risk factors for infant mortality, one of which is low birth weight. In prior research, a greater proportion of native-born Black women reported moderately low birthweight relative to foreign-born Black women; this disparity still persisted despite controlling for sociodemographic and reproductive risk factors (Brewin & Nannini, 2014; Pallotto, Collins, & David, 2000).

Studies have discovered that Black American preterm-birth infant mortality is higher than the total number of infant deaths for White Americans. Black Americans also have two times the rate of miscarriages relative to White Americans (Mukherjee et al., 2003; Salihu, August, de la Cruz, Mogos, Weldeselasse, & Alio, 2012). Preterm related infant mortality accounted for 45% of infant deaths among Black Americans. The leading cause of infant mortality is preterm birth which is associated with familial, social, and economic costs. Studies have also found that much of the infant mortality racial disparity can be attributed to preterm birth and low birth weight related issues (Rosenthal and Lobel, 2011; Schempf, Branum, Lukacs, & Schoendorf, 2007). If Black American infant deaths rates for preterm-related causes of death, congenital malformation, SIDS, and unintentional injuries were reduced to the levels of White Americans then the health disparity would be reduced by 70% (MacDorman, 2011). This begs the question of why foreign-

born Black Americans have similar rates to that of native-born White Americans if their native-born counterparts face such a severe disparity? Is this disparity related to nativity and the unique stressors within the life course of native-born Black Americans versus the foreign-born? Moreover, is the allostatic load a major contributing factor to the infant mortality disparity?

Methods:

Data

This study uses data from the National Longitudinal Study of Adolescent to Adult Health (Add Health). Add Health is a nationally representative sample of United States adolescents. The intention of Add Health is to study how social factors from adolescence are linked to health and other behaviors as participants enter adulthood and beyond. The study began sampling 7th to 12th grade students from the years 1994-1995 and onward every four years after the initial follow up. There are currently four waves of data available to the public. Wave II (1996), Wave III (2001-2002), and Wave IV (2008-2009). A gender and grade stratified random sample was selected from 80 high schools along with a feeder school wherein an in-school questionnaire was given to every student in these select schools from September 1994 to April 1995. After the original questionnaire, a 90-minute in-home interview was conducted, resulting in a total sample of 20,745 adolescents in Wave I wherein respondents ranged from ages 12-20 (Harris, 2013).

To arrive at the sample for this study, I first selected births that occurred in Wave III of IV (N = 7287). I then restricted the sample to births reported by women (n = 4531) since the reports of births by women tend to be more reliable than those reported by men. Next, I selected the first birth, yielding N = 1838 respondents. I selected only the first birth since prior births could lead to birth outcome differences that may be difficult to assess. Finally, I dropped women who were

currently pregnant since it is impossible to know the outcome of their pregnancy. Thus, the final sample consists of 1795 women who had their first birth, of which 1732 were native-born and 63 were foreign-born.

Measures

To quantify how race and nativity status may be affecting infant mortality disparities the variable of *adverse birth outcomes* (1 = *yes*, 0 = *no*) was created. Adverse birth outcome is assessed by using responses to the question, "How did the pregnancy end?" Women who reported as having either an abortion, ectopic or tubal pregnancy, miscarriage, or stillbirth were coded as having an adverse birth outcome.

Nativity status is assessed through the variable labeled *bornus* (1=yes), which was created using the questions, "Were you born in the United States?". Any respondent who was born outside of the United States was coded as foreign-born within the nativity status variable (0 = *no*). People who were born in the United States served as a reference group in the analyses. The *race* variable was coded using several questions that asked respondents their racial or ethnic background. *Race* was created using the questions "Are you Hispanic or Latino origin?", "What is your Race?" wherein the answers could be White, African American or Black, American Indian or Native American, Asian or Pacific Islander, or other (includes respondents who select multiple races). Respondents who identified as Black were set as the reference group in the analyses.

We also controlled for respondent's education, biological mother's education (serving as a proxy for socioeconomic status, as well as respondent's marital status, age, and employment. Marital status was a variable that asked whether the respondent was married (1 = *yes*) or not married (0 = *no*) at the time of the survey. Age was measured by taking the current year minus the

respondent's recorded birth date. Employment was a variable that asked whether the respondent was either working for pay (1 = *yes*) or not working for pay (0 = *no*) at the time of the survey. The respondent's education was measured by creating a variable that used the responses from the respondent's answer to the level of education they have completed to date. The categorical variable created includes four categories: (1 = *less than high school*, 2 = *high school or equivalent*, 3 = *some college*, 4 = *bachelors or higher*). The respondent's biological mother's education was measured by the respondent's response to the mother's highest level of education and creating a variable that matched the categories for the respondent's education categories (1 = *less than high school*, 2 = *high school or equivalent*, 3 = *some college*, 4 = *bachelors or higher,* 5 = *education unknown*). The total number of women who have had their first birth was 1,795 with 63 women being foreign-born. Of these women 66% identified as White, 19% identified as Black, 10% Hispanic, 3% Native American, 1% Asian, and 1% other. Of this population, the foreign-born individuals consisted of 61% self-identified Hispanic, 21% Asian, 11% White, 4% Black, and 3% other.

Analytic Strategy

I used two sets of analyses to examine the relationship between adverse birth outcomes, nativity, and race. First, I ran weighted descriptive analyses to examine differences between native- and foreign-born respondents on adverse birth outcomes, race, and all other covariates, noting significant differences where applicable. Second, I estimated a series of weighted logistic regressions of adverse birth outcomes on nativity, race, and other covariates. All analyses are weighted to account for unequal selection into the sample and missing data were imputed through multiple imputation in Stata using five replicates.

Results:

Table 1 shows the weighted means and percentages for all variables included in this study for foreign- and native-born women. The adverse birth outcomes for native-born women were slightly higher than foreign-born women by 2.04%. Although this difference was not significant it is still noteworthy, as it aligns with the expectation that native-born individuals were more likely to have adverse birth outcomes relative to the foreign-born. The majority of the native-born population was White (65%) while the foreign-born was majority Hispanic (61%). Black women made up 4% of the foreign-born sample and 19% of the native-born sample. Interestingly, the foreign-born population was made up of 20% Asians while the native-born population only consisted of a little over 1%. Nearly all comparisons of race/ethnicity between the foreign and native-born were significant with the exceptions of the comparison for Native Americans (likely due to a small sample size). Foreign-born women were slightly more likely to have some college or a college degree or higher than native-born women, but neither were by a significant amount. The native-born were more likely to graduate high school while both had a similar percentage of those reporting less than high school education. As for the mother's education levels, native-born were more likely to have some college, however, this was not significant. The foreign-born women's mothers were more likely to have a college degree or higher, but again, was not significant. It is noteworthy to mention that most respondents did not know their mother's highest degree achieved. Native-born women were also more likely to be employed in full time work (94.8% versus 92.6%). Foreign-born women were more likely to be married at the time of pregnancy than native-born— about ¾ of foreign-born women were married relative to 2/3 of native-born women.

(Insert Table 1 here)

Table 2 presents the results from the weighted logistic regression of adverse birth outcomes on nativity and other included covariates. Model 1 accounts for only nativity and race. Findings from Model 1 aligned with what I hypothesized; foreign-born women were less likely to have adverse birth outcomes than their native-born counterparts, but this association was not significant. Model 1 shows that Asians were significantly more likely than other races to have adverse birth outcomes. Black women were more likely to experience adverse birth outcomes than White, Hispanic, and respondents of Other Races in Model 1, although these associations were not significant. Model 2 adds all other covariates. Findings regarding nativity and race largely mirror those in Model 1. Model 2 also shows that a bachelor's degree or higher was positively related to adverse birth outcomes and was significant. Marriage had a negative and significant association with adverse birth outcomes in Model 2. Model 3 adds interactions between race and education. Model 3 shows that relative to Black women with a bachelor's degree or higher, White women with a bachelor's degree or higher had a lower risk of adverse birth outcomes.

(Insert Table 2 here)

Discussion:

Research has indicated that there are notable racial healthcare disparities in the United States (Latinsky, 2019; MacDorman, 2011; Rosenthal & Lobel, 2011). Nativity may be an important social factor to explain this inequality (Almeida, Mulready-Ward, Bettegowda, & Ahluwalia, 2013; Green & Hamilton, 2019; Pallotto, Collins, & David, 2000; Parker-Dominguez et al., 2009). Studies have found that foreign-born women have better reproductive health outcomes when compared to native-born women. This study found that the foreign-born women did have a greater likelihood of positive reproductive health outcomes when compared to the native-born,

however this was not significant. Studies have also found that reproductive health outcomes, specifically infant and maternal mortality, have severe racial disparities. Black women have been found to have higher risks of adverse birth outcomes than all other races in other studies (MacDorman, 2011; Rosenthal & Lobel, 2011). This study found that Black women were more likely to experience adverse birth outcomes than White, Hispanic, and Other Race identified women but not when compared Native American and Asian identified women, even though these findings did not achieve statistical significance. Some studies have also indicated there may be a relationship between education attainment and adverse birth outcomes. This study echoed these findings from prior research by showing Black Americans with a college degree with greater health disadvantages relative to their White American peers.

Although explored in prior research, the association between race and adverse birth outcomes is poorly understood. Race has been linked to multiple healthcare disparities in the United States, including reproductive health outcomes. This study found that adverse birth outcomes did vary across racial groups, with the Asian women facing the largest risk of adverse birth outcomes and Black women facing a higher risk of adverse birth outcomes than White, Hispanic, and Other identified women. With such a diverse population in the United States that continues to grow every year, the potential link between a person's racial identification and their reproductive health outcomes is something that needs to be addressed immediately. A person cannot change their racial category and with the historical implications regarding marginalized groups and reproductive rights, this continued trend could indicate that these racist ideologies and behaviors are still present in today's society.

There has been limited research on the link between nativity and adverse birth outcomes. This is a notable gap in the literature available on the link between nativity, race, and adverse birth

outcomes despite there being a clear association. If foreign-born Black women have similar rates of adverse birth outcomes to those of native-born White women then that implies that the connection to adverse birth outcomes goes beyond their racial category. Does the allostatic load unique to that of native-born individuals in the United States explain the adverse birth outcome disparity between the native-born and foreign-born? Is it a combination of both the support from the ethnic enclave and the difference in the allostatic load? Does the higher discrimination and prejudice faced by native-born women greatly affect the pregnancy outcomes? These answers to these questions are needed to properly address the infant mortality disparity that the United States is facing. If the disparity is because of something embedded in the system or the culture, then that could lead to an even bigger discussion about how to combat or change these ideologies/ behaviors.

Education and adverse birth outcome research have been explored numerous times, but with varying results. For instance, some studies find higher education attainment with lower adverse birth outcomes in all racial groups except for Black women. Researchers also found that the level of protection typically offered by increased education is not uniform across racial groups (Green & Hamilton, 2019; Rosenthal & Lobel, 2011). This study found that Black women with a bachelor's degree or higher had higher adverse birth outcomes when compared to White women with a bachelor's degree or higher. Therefore, the link between education and adverse birth outcomes is unclear and if there is an inverse link between education and adverse birth outcomes—why do Black women experience higher adverse birth outcomes with higher education attainment? Does this have to do with higher rates of exposure to racism, based on the neighborhood demographic higher educated Black women may be residing in? Does the racial

concentration of the neighborhood, medical facilities, workplace, or school affect reproductive health outcomes? These are all questions that need be addressed in future studies.

Although this study shed new light on the relationship between race, nativity, and adverse birth outcomes, this study is not without limitations. This study faced several limitations including small sample size in part due to restricted access to the data set, the concept of first- and second-generation individuals, multiple births, and lack of ways to measure specific experienced stress from discrimination or prejudice. First, the sample size used in this study was small— in particular, the share of foreign-born individuals comprised a very small portion of the entire sample. In order to potentially combat this issue, future work may decide to include second-generation individuals as a way to increase sample size. However, the potential second generation may have lived different life experiences in the United States than their parents, meaning the allostatic load could be greatly impacted. Second generation individuals may experience a higher rate of discrimination and prejudice than their parents, therefore their health outcomes may be similar to that of native-born individuals rather than foreign-born. This study also only uses half of the Add Health sample so future work should incorporate all Add Health respondents if possible to reduce sample size issues . Second, previous studies have found that previous births, even ones that ended in adverse birth outcomes, can have an effect on the current pregnancy. Therefore, it was necessary to limit the study to first birth rather than all births by one woman otherwise risk potentially increasing the odds of adverse birth outcomes disproportionately for certain women. Future work may want to consider other analytic strategies that could be used to account for all of a woman's births. A third limitation of this study is related to measurement. In the current dataset used in this study, I was unable to measure stress brought upon the individual through discrimination or prejudice. There was not a definitive way

to ensure that the stress experienced by the respondent was due to discrimination or prejudice. Therefore, the allostatic load could not be thoroughly compared between foreign- and native-born respondents. Future work may want to consider alternate datasets or perhaps qualitative studies to further examine the effect of various stressors, discrimination, and prejudice on birth outcomes. Despite these limitations, this project makes an important contribution to current work on race, nativity, and adverse birth outcomes through showing the potential importance of nativity when examining reproductive health disparities by race.

This area of research continues to need the attention of scholarly efforts. In the future, I plan to add variables like characteristics of the respondent's neighborhood and potential ways to measure stress, if available. I also plan to use the full Add Health data set instead of the restricted version which could increase the sample size and full utilization of the variables. Additionally, an in-depth exploration of the Asian American adverse birth outcome disparity found in this study is important to investigate since there is limited research on this topic. Moreover, it may be useful to explore these research aims using other datasets or with qualitative work. In both qualitative and quantitative method studies how has the nativity status of the respondents affect the health outcomes? This strategy could be useful for examining the link between race, nativity, and adverse birth outcomes using a wider scope.

In sum, this study contributes to the research done on reproductive disparities as it contributes the additional support of a potential link between nativity status and reproductive health outcomes. Continuing this work is crucial. If scholars can identify the main drivers of health disparities between race and ethnic groups in the USA (e.g., nativity or even education), we can then turn our attention to the mechanisms through which health is disrupted, such as discrimination, bias, as well as unequal access to resources. Then, if researchers are able to

identify mechanisms that most strongly relate to health disparities, we can work toward devising policies, programs, and initiatives aimed at reducing these health-related inequalities, like adverse birth outcomes.

Table 1. Weighted Means (Standard Deviations) and Percentages (n = 1795)

	Foreign-born	Native-born	
Dependent Variable			
Adverse Birth Outcome	23.86	25.90	
Covariates			
Race			
White	11.08	65.69	***
Black	4.23	19.13	**
Hispanic	61.02	9.78	***
Asian	20.61	1.58	***
Native American	0.00	3.10	
Other	3.06	0.72	+
Age (in years)	29.70(.22)	29.06(.05)	**
Education			
Less than high school	7.95	7.98	
High school	12.10	17.31	
Some college	56.99	52.23	
College or higher	22.96	22.48	
Mom's Education (biological)			
Less than high school	2.36	3.60	
High school	0.00	5.13	
Some college	1.42	1.53	
College or higher	3.57	1.44	
Don't know mom's education	92.65	88.30	
Employed (full time)	92.63	94.76	
Married	74.98	66.63	

+ $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

Table 2. Weighted Logistic Regression of Adverse Birth Outcomes Nativity and Other Covariates (n = 1795)

	Model 1		Model 2		Model 3	
Focal Independent Variable						
Foreign-born	-0.41 (.37)		-.39 (.37)		-.46 (.41)	
Covariates						
Race						
White	-.20 (.15)		.03 (.16)		.74 (.44)	+
Black (ref)						
Hispanic	-.09 (.23)		.18 (.25)		1.20 (.55)	*
Asian	1.08 (.37)	**	1.12 (.37)	**	.11 (1.2)	
Native American	.13 (.32)		.32 (.33)		1.12 (.74)	
Other	-.62 (.61)		-.39 (.60)		-.62 (.91)	
Age (in years)			-.01 (.04)		-.01 (.04)	
Education						
Less than high school			.14 (.31)		.83 (.60)	
High school (ref)						
Some college			.23 (.18)		.85 (.42)	*
Bachelors or higher			.92 (.20)	***	1.79 (.45)	***
*Education*Race*						
White*Bachelors or higher					-1.10 (.52)	*
Hispanic*Some college					-1.41 (.63)	*
Mom's Education (bio)						
Less than high school			-.08 (.42)		.04 (.42)	
High school						
Some college			.25 (.50)		.31 (.49)	
Bachelors or higher			.02 (.56)		-.02 (.56)	
Don't know			-.09 (.30)		-.09 (.30)	
Employed (full time)			.17 (.30)		.12 (.30)	
Married			-.71 (.14)	***	-.71 (.14)	***
Constant	-.94 (.12)		-1.21 (1.3)		-1.95 (1.3)	

+ $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

References:

Almeida, J., Mulready-Ward, C., Bettegowda, V. R., & Ahluwalia, I. B. (2013). Racial/ethnic and nativity differences in birth outcomes among mothers in New York City: The role of social ties and social support. *Maternal Child Health Journal*, *18*, 90-100.

Brewin, D., & Nannini, A. (2014). Using a life course model to examine racial disparities in low birth weight during adolescence and young adulthood. *Journal of Midwifery & Women's Health*, *59*(4), 417-427.

Dannefer, D. (2003). Cumulative advantage/disadvantage and the life course: cross-fertilizing age and social science theory. *Journal of Gerontology, Social Sciences*, *6*, 327-337.

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. https://doi.org/10.1016/j.socscimed.2009.03.022

Fishman, Samuel; Hummer, Robert; Sierra, Gracia; Hargrove, Taylor; Power, Daniel A.; & Rogers, Richard G. (2019). *Race/Ethnicity, Maternal Educational Attainment, and Infant Mortality in the United States.* Population Association of America annual meeting. Austin, TX.

Green, T., & Hamilton, T. G. (2019). Maternal educational attainment and infant mortality in the United States: does the gradient vary by race/ethnicity and nativity? *Demographic Research*, *41*(25), 713-752.

Harris, K.M., C.T. Halpern, E. Whitsel, J. Hussey, J. Tabor, P. Entzel, and J.R. Udry. 2009. The National Longitudinal Study of Adolescent to Adult Health: Research Design [WWW document]. URL: https://addhealth.cpc.unc.edu//documentation/study-design.

Latinsky, A. (2019). *Weathering the storm: An examination of fetal loss, maternal age, and norms of race and sexuality* (dissertation), 1-78.

MacDorman, M. F. (2011). Race and ethnic disparities in fetal mortality, preterm birth, and infant mortality in the United States: An overview. *Seminars in Perinatology, 35*(4). 200-208.

Mehra, R., Keene, D. E., Kershaw, T. S., Ickovics, J. R., & Warren, J. L. (2019). Racial and ethnic disparities in adverse birth outcomes: differences by racial residential segregation. *SSM- Population Health*, 1-10.

Mendez, D. D., Almario, D., Kim, K. H., Amutah, N. N., Fabio, A., & Bodnar, L. M. (2014). Neighborhood socioeconomic disadvantage and gestational weight gain and loss. *Maternal Child Health Journal*, *18*, 1095-1103.

Nkansah-Amankra, S., & Tettey, G. (2015). Association between depressive symptoms in adolescence and birth outcomes in early adulthood using a population-based sample. *Preventative Medicine Reports, 2*, 371-378

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. https://doi.org/10.1016/j.socscimed.2011.01.013

Salihu, H. M., August, E. M., de la Cruz, C., Mogos, M. F., Weldeselasse, H., & Alio, A. P. (2012). Infant Mortality and the risk of small size for gestational age in the subsequent pregnancy: A retrospective cohort study. *Maternal Child Health Journal*, *17*, 1044-1051

Schempf, A. H., Branum, A. M., Lukacs, S. L., & Schoendorf, K. C. (2007). The contribution of preterm birth to the Black-White infant mortality gap, 1990 and 2000. *American Journal of Public Health*, *97*(7), 837-843.

Singh, G. K., & Yu, S. M. (1996). Adverse pregnancy outcomes: differences between US- and foreign-born women in major US racial and ethnic groups. *American Journal of Public Health*, *86*(6), 837–843. https://doi.org/10.2105/ajph.86.6.837

Smedley, B. D., Stith, A. Y., & Nelson, A. R. (2003). *Unequal treatment: confronting racial and ethnic disparities in health care*. National Academy Press.

Spriggs Madkour, A., Wheeler Harville, E., & Xie, Y. (2014). Neighborhood disadvantage, racial concentration and the birthweight of infants born to adolescent mothers. *Maternal Child Health Journal*, *18*(3), 663-671.

Villalonga-Olives, E., Kawachi, I., & von Steinbuchel, N. (2016). Pregnancy and birth outcomes among immigrant women in the US and Europe: A systematic review. *Journal of Immigrant Minority Health, 19*, 1469-1487.

Wallace, M., Harville, E., Theall, K., Webber, L., Chen, W., & Berenson, G. (2013). Preconception biomarkers of allostatic load and racial disparities in adverse birth outcomes: the Bogalusa Heart Study. *Paediatric and Perinatal Epidemiology*, *27*, 587-597.

Washington, H. (2010). *Medical apartheid the dark history of medical experimentation on Black Americans from colonial times to the present*. Paw Prints.

Waters, M. C. (1999). *Black identities: West Indian immigrant dreams and American realities*. Harvard Community Press.