

The Generational Effects of Racism on Maternal and Infant Health

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Black neonates suffer from one of the largest inequalities in health care and health outcomes than any other group in the United States. The disparities and inequalities seen in Black infants are a reflection on the mother's life from birth to maternal age taking into account chronic stressors and racism experienced throughout her life. The following paper will review the impact racial discrimination during an African American mother's lifetime has on an infant's health outcomes, with a special focus on infant mortality, low birth weight (LBW) births, preterm births (PTB), and small for gestational age (SGA) births. Racial justice must be thought of more than a political stance or rights for all Americans. Racism is a public health crisis that unnecessarily claims thousands of African American infants every year with the cause being wrongly attributed to lack of education or genetic differences. Dr. Gilbert Gee and other researchers are echoing the generational sentiment that an infant's health is not independent of its mother's and the lived experiences of her racial classification play a key role in both of their health (Gee et al., 2012).

In the paper "Physician-patient racial concordance and disparities in birthing mortality for newborns" Greenwood et al. evaluate the significance of the patient-physician racial concordance between Black newborns and their Black or white doctors (Greenwood et al., 2020; Love et al., 2010). The authors hypothesized that they would see a decrease in survival rates of Black neonates when there was a lack of racial concordance between doctor and patient.

To test this theory the researchers collected data from the State of Florida's Agency for Healthcare Administration (AHCA) from 1992 to 2015 which has extensive information on infants born in the state of Florida that included race, doctor, comorbidities, hospital, and

outcomes. No information was given in the provided data regarding the race of the physicians therefore the information was compiled from public searches of the physicians. Any newborn or doctor not clearly identified as black or white were eliminated from the study. The researchers provide an extensive appendix within which they go into depth into their detailed methods in selecting the newborns and physicians that would be included in the study. Four research associates were tasked with assessing “race” often from a single photo of doctors found online which was then cross checked with other researcher’s work. The associates collaborated on photos where there were discrepancies and had to be in 100% agreeance in order for the physician to be considered. As an additional step, the last names of all physicians in the data set were checked against common African American last names as provided by the government and the last names of affluent business African Americans in the country. Although the researchers included many controls in order to mitigate false negatives and false positives, their system at its core could be considered flawed. Not only is defining a person’s race by a picture a subjective measurement, the error was then compounded by allowing associates to be convinced of the race of doctors they were unsure about. There is also no clear data supporting the correlation between skin color and surname as the paper suggests and therefore places doubt on the legitimacy of the race coding of the physicians in the study.

The concordance effect is thought to have many factors that contribute to its prevalence, however, by studying this phenomenon in infants, researchers were able to eliminate the possibility of patient-physician communication as a contributing factor to the effect in this study. The equation presented in Figure 1 was used to examine the affect patient-physician racial concordance has on neonate mortality, with variables for patient race (x_i) and physician race (x_j). When $y_{ijt} = 0$ the newborn survives and when $y_{ijt} = 100$ the newborn expires. From the data, the

researchers found that when cared for by a white doctor after birth, a Black newborn is three times more likely to die than a white newborn. There are 257 less deaths per 100,000 births when Black newborns are treated by Black physicians and the gap between the Black and white infant mortality rate is also seen to decrease by 58% when there is racial concordance with Black newborns. No significant racial concordance effects were visualized in white newborns nor Latino newborns when additional research was conducted.

$$y_{ijt} = \beta_1 x_i + \beta_2 x_j + \beta_3 x_i x_j + \varepsilon_{ijt},$$

Figure 1. Patient-physician racial concordance on newborn survival (Greenwood et al., 2020).

The researchers agreed there was significant evidence to support their hypothesis that racial concordance in Black infants increases their survival rate and resolves some of the gap observed in newborn mortality, however, there was still a significant disparity experienced by Black newborns that could not be explained by the study. There is a common thought that experience and improvement, or success, share a positive correlation, however, the quantity and frequency at which Black doctors treated Black babies had little to no effect on the outcomes of future cases, indicating additional factors accounted for the remaining disparities in infant mortality. The question then becomes what are those additional factors? The authors touch upon the generational stress and hardship that mothers with dark skin experience in the United States which have shown to lead to other negative health outcomes such as lower infant birth weights than white mothers.

As stated in the paper, birth time is unpredictable and therefore matching each child to a physician of a similar skin color is impossible due to the random selection and lack of Black

physicians in hospitals. The burden of ensuring the wellness of the country's Black infants should not be placed in the hands of a few Black physicians. Despite the unreliable way in which physician race was determined in the study, the importance and significance of the research cannot be disputed. White doctors are systemically failing their Black patients. An additional look into the outcomes of Black infant patients with other ethnically diverse physicians could expose the cause of the racial concordance effect, be it institutional, the way physicians are trained, the internalized racism of doctors, or all of the above.

Generational stress and lifelong racism experienced by the mother may play a role in the negative health outcomes observed in Black infants in the United States. The relationship surrounding maternal birth age and low birth weight (LBW) has been well studied with researchers seeing a decrease in LBW births as white women get older (A. T. Geronimus, 1992). Similar studies have been performed on African American, or Black, women in relation to preterm birth (PTB) in which researchers found the unusual pattern that the likelihood for a worse birth outcome increases as the women age past 20 years (A. T. Geronimus, 1992). Researchers coined the term "weathering" to describe the phenomenon and alluded to the cause being related to socioeconomic differences between white and Black women (A. T. Geronimus, 1992).

In the paper "Exploring Weathering: Effects of Lifelong Economic Environment and Maternal Age on Low Birth Weight, Small for Gestational Age, and Preterm Birth in African-American and White Women" Dr. Catherine Love and the other researchers investigate the effect socioeconomic status and maternal age have on LBW births. It was hypothesized that, "African-American women never exposed to poverty would not experience weathering, and second, that

white women who are exposed to poverty throughout their life would display evidence of weathering” (Love et al., 2010).

The study was conducted by recording single births in Cook County, Illinois during 1989 – 1991. The birth certificates of the mothers were matched to the births and only mothers who identified as non-Hispanic African-American women or white women who lived in Cook county at birth were included. The census was then used to determine the socioeconomic standing of each woman using the median family income of the geographic area. The women were grouped by the age at which they gave birth (<20, 20–24, 25–29, and 30–35 years), and into upper and lower incomes with the median for the mothers being \$27,427 and their offspring being \$35,427. Within those two groups the women were further categorized as lower-lower, lower-upper, upper-lower, and upper-upper. This type of transgenerational study allowed the researchers to observe some of the generational effects of socioeconomic status and race on LBW, PTB, and small for gestational age (SGA) birth outcomes. Low birth weights and preterm births were calculated in the offspring using typical medical practices; however SGA birth outcomes were estimated by determining the 10th percentile of birth weights from 1994 – 1996 in the US for each gestational age and then categorized by sex and race. If Black women are statistically more likely to live in poorer neighborhoods and have higher rates of PTB and LBW births, then this method of calculation may have skewed the results preventing them from showing the full extent of racial differences between birth outcomes of Black and white neonates. Although the calculations for SGA are flawed, the methods and research of the rest of the study seem to hold scientific merit.

The data collected only supported the hypothesis that Black women who were in the upper-upper quartile did not experience weathering as the age groups increased as seen in Figure

2. White women, shown in Figure 3, never experienced weathering, even when in the lower-lower subgroup. The researchers predict that some of the data could be explained by the fact that 67% of the African American mothers lived in the lower income neighborhoods, while 63% of the white mothers lived in the upper income neighborhoods. They attest that this inequality in distribution may account for the large gaps between Black and white mothers observed in their data. Overall, African American mothers were found to have higher rates of preterm birth and low birth weights than white mothers even when adjusted for socioeconomic status.

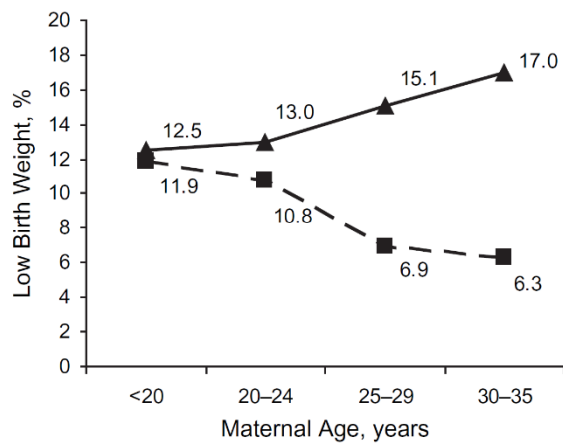


Figure 2. Low birth weight rate compared to maternal age in non-Hispanic African-American mothers in the lower-lower (triangles) and upper-upper (squares) quartiles.

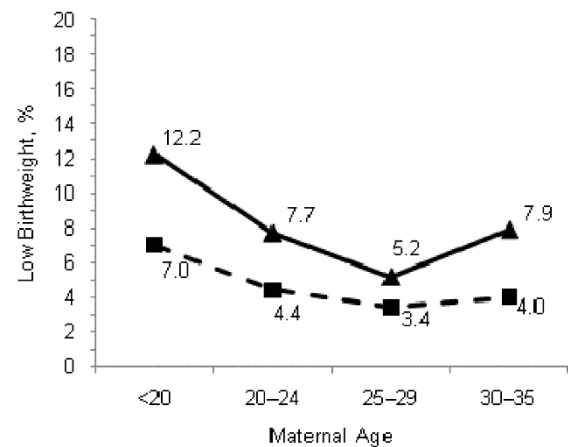


Figure 3. Low birth weight rate compared to maternal age in non-Hispanic white mothers in the lower-lower (triangles) and upper-upper (squares) quartiles.

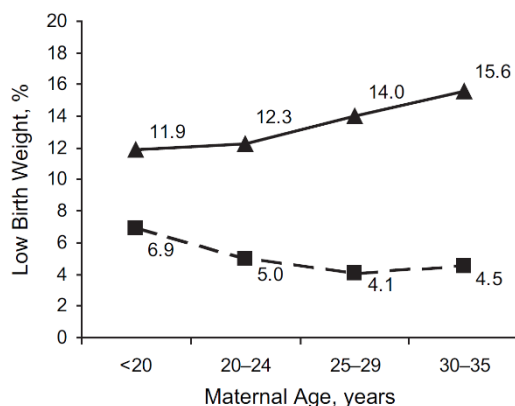


Figure 4. Low birth weight rate compared to maternal age in non-Hispanic African American mothers (triangles) and white mothers (squares).

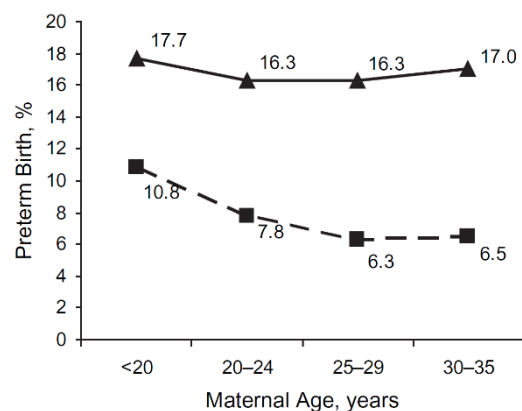


Figure 5. Preterm birth rate compared to maternal age in non-Hispanic African-American mothers (triangles) and white mothers (squares).

The significance of the effect economic status of where you are born and reside has on the birth outcomes of your offspring is clear through their data, especially for Black women. The researchers were able to highlight the age risk pattern associated with socioeconomic income in both Black and white women. The authors attribute much of their results to two mechanisms: fetal programming and “wear and tear.” Undernutrition and other factors associated with lower socioeconomic status can contribute to a woman’s ability to birth normal weight, term babies which they include under fetal programming. The paper acknowledges that the “wear and tear” and hardships, which they suggest explain significant portions of the data, may in fact come from the racial injustices experienced by Black women in America, such as racial income inequality and other racial bias stressors. The researchers admit that although a self-proclaimed life-course study, having only two time points in the women’s lives limits the validity of some of their claims but now serves as a basis for future research on the topic.

Love et al. suggest that more resources be put into improving the economic status of Black women as a way to improve their birth outcomes, however this limited conclusion ignores a large proportion of their study in which huge gaps in birth outcomes cannot be explained by income alone. The authors write that Black women who managed to “[escape] the ghetto” see patterns similar to white women by looking at the curve of the graph and not the numbers presented (Love et al., 2010). Although they touch on racial injustices, a solution that ignores its significance in the study cannot be recommended.

Beyond glazing over years of racism, previous research has asserted that the gap between low birth weight in U.S. born Black and white mothers is due to the genetic differences of races and the associated risks that are more prevalent in certain races. To counter these arguments, researchers Richard David and James Collins hypothesized in the paper “Differing Birth Weight

among Infants of U.S.-Born Blacks, African-Born Blacks, and U.S.-Born Whites” that if this is true then it should be found that European Americans give birth to infants with the highest birth weights and West African born women give birth to infants with the lowest birth weights. The researchers focused on West African women as a comparison to U.S. born Black and white women as a result of a high proportion of American slaves being kidnapped from West Africa. Due to their West African and European mixture from slavery, US born Black women’s infants should fall between the two in terms of birth weight.

Single births from 1980 to 1995 were collected from the Illinois Department of Public Health. Mothers were considered if they identified on their child’s birth certificate as non-Hispanic white and U.S. born, non-Hispanic Black and U.S. born, or born in one of 17 West African countries. The infants were categorized by their mother’s place of birth and race: U.S born Black women, U.S. born white women, and West African born women. The infants were compared by distribution of birth weight, mean birth weight, and rate of low birth weight (infants born under 2,500 g). Women were further matched for sociodemographic and reproductive risk factors including variables such as marriage status, previous pregnancies, education level, and other risk factors.

VARIABLE	SUBGROUP OF MOTHERS			RELATIVE RISK (95% CI) IN BLACK MOTHERS†	
	U.S.-BORN WHITES	AFRICAN-BORN BLACKS	U.S.-BORN BLACKS	AFRICAN-BORN	U.S.-BORN
Raw data					
No. of births	44,046	3135	43,322		
Mean birth weight (g)	3,446	3333	3,089		
Low birth weight (% of infants)	4.3	7.1	13.2	1.6 (1.4–1.9)	3.1 (2.9–3.2)
Moderately low	3.6	4.8	10.6	1.3 (1.1–1.6)	3.0 (2.8–3.1)
Very low	0.7	2.3	2.6	3.2 (2.5–4.1)	3.5 (3.1–4.0)
Matched cases‡					
No. of births	2,950	2950	2,950		
Mean birth weight (g)	3,475	3341	3,195		
Low birth weight (% of infants)	3.6	6.9	8.5	1.9 (1.5–2.4)	2.4 (1.9–2.9)
Moderately low	3.1	4.7	6.1	1.5 (1.2–2.0)	2.0 (1.5–2.5)
Very low	0.5	2.2	2.4	4.1 (2.4–7.0)	4.5 (2.6–7.7)

*Data on birth weight were missing for 19 infants (0.02 percent of the total). Low birth weight was defined as a weight of less than 2500 g, moderately low birth weight as a weight of 1500 to 2499 g, and very low birth weight as a weight of less than 1500 g.

†Relative risks shown are for the risk of low birth weight in the infants of women in the group shown as compared with the infants of U.S.-born white women. CI denotes confidence interval.

‡In this analysis, each African-born black woman was matched with one U.S.-born white woman and one U.S.-born black woman for age, marital status, education and spouse's education, prenatal care, parity, and the presence or absence of previous fetal loss.

Table 1. Birth weight data according to mother's place of birth and race.

As seen in Table 1, U.S. born white women, on average, have babies that are 98 g heavier than African born Black women and 248 g more than U.S. born Black women. The disparity widens further when African born Black women are matched with one U.S. born white woman and one U.S. born Black woman of the same age, marital status, education, spousal education, prenatal care, parity, and previous fetal loss. Black mothers born in the U.S. experience rates of LBW at almost three times the rate of white mothers. Even when matched, Black women in the U.S. see more than double the occurrence of LBW than white women in the U.S. Interestingly, the gaps between the mean birth weight of the three women's groups gets larger when the mothers are matched. Matched or unmatched, the distribution pattern seen in Figure 6 did not significantly change even when the numbers did slightly. No matter how the data is presented U.S. born Black women have significantly smaller infants than African born and U.S. born white women.

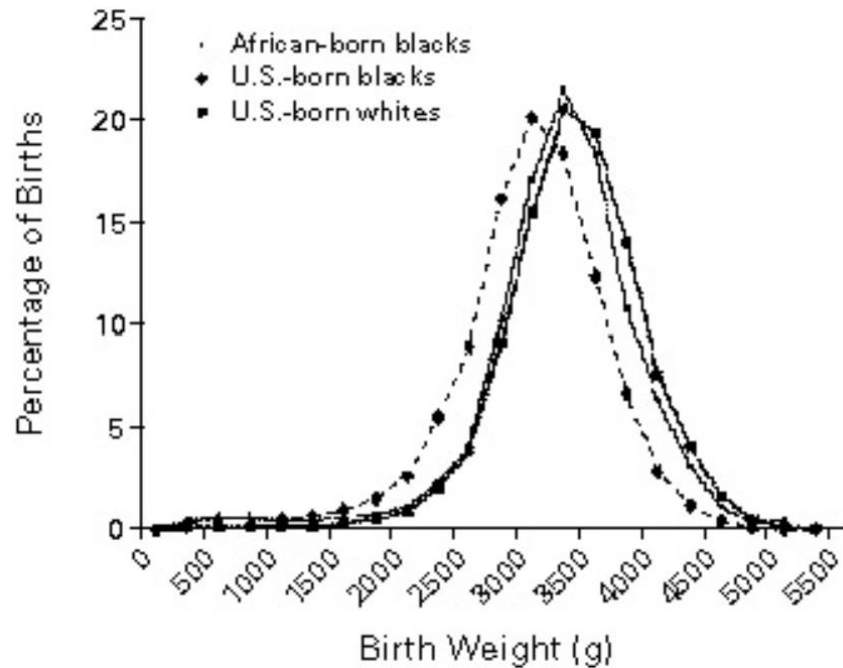


Figure 6. Distribution of birth weight based on mother's race and birthplace.

Richard David and James Collins concluded based on their data that there is no genetic basis, rooted in racial differences, for LBW and the disparity between Black and white mothers born in the U.S. The researchers were not shocked by their “discoveries” as they cited previous studies that echoed their results. Further research could be conducted that investigates the birth weight distribution of West African infants and compares them to West African mothers who give birth in the U.S. to quantify the acquired health of moving to America. Additional research also alludes to the assertion that Black women have heavier babies when they are born outside of the U.S. (Valanis & Rush, 1979). The possibility that these consistent gaps are a result of racial discrimination is brushed over at the end of the paper and no real explanation is presented or recommendation made. Despite how little it was discussed, the data is significant in bringing to light the role racism plays in public health by dispelling any arguments that the observed disparities are due to genetics.

The disparities discussed above can not be solved by increasing the education level of Black women or providing food, home, and job security alone. High rates of infant mortality and low birth weight infants are the result of generational racial trauma experienced by great grandmothers that is eventually passed on to great grandchildren. America is not shy in its racism, in fact, its effects on birth outcomes is not unique to Black Americans. Six months following the attack on September 11th 2001, Arabic-named women had an increased risk of giving birth to LBW infants as compared to six months before the attack (Lauderdale, 2006). The change in health outcomes for these women is thought to be due to the increased discrimination of the Arab American population.

The role chronic stress and racism play in maternal health is described by Dr. Arline Geronimus as the weathering hypothesis. The weathering hypothesis is the continued exposure to racial discrimination and racial stress throughout one's lifetime that are thought to cause younger optimal maternal age, higher rates of infant mortality, LBW infants, maternal hypertension, and shorter maternal telomere length (A. T. Geronimus, 1992; Arline T. Geronimus et al., 1991, 2010). Black women 25 years old and older are 2x more likely to have hypertension than white women and the risk doubles again after the age of 35 (Arline T. Geronimus et al., 1991). By the time Black women reach the age range of perimenopause, they are biologically around 7.5 years older than white women of the same age (Arline T. Geronimus et al., 2010).

The distinct health gaps that could not be erased by patient-physician racial concordance, matching for education level and marital status, and racial differences will only be resolved once we see the abolition of white supremacy and active efforts to reverse the generational trauma and chronic illness seen in Black communities.

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