

Sociomedicine: Explanations for race disparities in infant mortality



Adrienne C. Simmons

Ms. Simmons is a fourth-year medical student at Case Western Reserve University School of Medicine, Cleveland, OH. She is the recipient of the third place award in the Alpha Omega Alpha Honor Medical Society 2022 Helen H. Glaser Student Essay Award.

Infant mortality rate (IMR) is defined as the death of an infant during their first year of life, and is measured by the number of deaths per 1,000 live births. Major causes of IMR include birth defects, preterm birth, low birth weight, maternal pregnancy complications, sudden infant death syndrome, and injuries such as suffocation.¹

General trends show that IMR has decreased globally and within the United States. However, the American IMR shows differences by geographic location, and by race. The IMR for Black Americans is significantly higher than that of White Americans.

Past and current areas of improvement for this rate included programs such as prenatal care, family planning

education, and substance abuse counseling. Despite these efforts, the race disparity in IMR has been consistent throughout the last century. While individual-based factors can explain some of the differences between IMR for White and Black populations, structural and societal mechanisms are more likely the root cause.

Trends in IMR

Globally, most countries have an IMR below 30. Data from 2000 shows that North America, Europe, the southern tip of South America, and coastal regions of China make up the majority of countries with low IMRs.² However, in 2013, the U.S. ranked 51st nationally for IMR—a ranking comparable to countries with an almost three-fold difference in Gross Domestic Product (GDP) per capita.³

The Centers for Disease Control and Prevention (CDC) cited the U.S. IMR as 5.7 in 2018, 2.3 percent lower than in 2017.¹ Though the IMR decreased, and continues to do so, the distribution of IMR is unequally spread across the country, especially along racial lines. Across the U.S., non-Hispanic Black residents have the highest IMR.¹ From 2010 to 2013, this rate was 7.5 deaths per 1,000 live births, as compared to the national average of six deaths per 1,000 live births.⁴ This rate is even higher than that of other minority groups such as Native Hawaiians, Pacific Islanders, American Indians, and Alaskan Natives, despite the fact that these other minority groups boast rates almost two times higher than their Hispanic, non-Hispanic White, and Asian counterparts.¹

Throughout the 20th century and into the 21st century there has been a steady decline in IMR. In 1915, approximately 100 White infants per 1,000 live births died in the first year of life. At that time, the rate for Black infants was almost twice as high at approximately 200 infant deaths per 1,000 live births.⁵ In 1998, the infant mortality rate was 7.2 overall, 6.0 for White infants, and 14.3 for Black infants. The national IMR fell 93 percent between 1915 and 1998. Yet, the IMR for Black babies stayed consistently

two times higher than the national average, regardless of advances in areas thought to decrease IMR.⁵

Despite efforts in social welfare programs such as parent education, prenatal care, and postpartum home visits, this trend in racial disparities in IMR continued through 2017. Intriguingly, this trend only existed for American-born Black citizens. Foreign-born Black individuals in the U.S. have a lesser risk of infant mortality than their American-born counterparts, suggesting this disparity is due to more than just genetics.⁶

Causes of racial disparities in IMR

Maternal depression, maternal education, environmental and structural stressors, and adolescent pregnancy have all been cited as potential causes of infant mortality. These are also areas where there is disparity in care between Black and White women.

Many studies highlight increased rates of maternal depression in the Black community. Compared to White women, Black women are significantly more likely to report depression during the perinatal period.⁷ U.S. born, non-Hispanic Black mothers are more than two times more likely than their White counterparts to have chronic depression.⁷ Depressed Black mothers are also more likely to experience multiple adversities and are less likely to receive medical care, support, and resources for their depression than their White counterparts.⁸ Children of mothers with postnatal depression, or symptoms of depression, have an almost two times higher risk of infant death compared to those with a mother not experiencing depression.⁹

Education

The relationship between maternal education and IMR is analogous to that of maternal depression and IMR. In an empirical study of the influence of maternal education on infant mortality, the majority of Black infant deaths occurred for mothers with less than 12 years of education.¹⁰ Child mortality decreases as paternal education and maternal education increases, though the effect of paternal education is to a lesser degree.¹¹

Though infant mortality decreases when education increases, the racial disparity between Black and White IMR increases as maternal education increases.¹¹ Compared to White women, Black women have at every level of education a higher risk of infant mortality, even when adjusted for covariates. In both races, a high school education reduces risk of infant mortality more than 10 percent, however, additional education only reduces the risk of IMR

for White women.¹² Comparing Black and White women who have not graduated high school, the disparity in IMR is 1.5. Comparing Black and White women with postsecondary educations, the disparity in IMR increases to 2.5, demonstrating that higher education does not seem to have a protective benefit for Black women.¹⁰

Mothers who are still in high school do not alter this trend. Adolescent pregnancy is frequently cited as a potential cause of high IMR, especially when using the logic that less biologically developed stages are not congruent with healthy childbearing. Data shows that in the U.S., Black women have higher rates of adolescent pregnancies than White women. However, Black mothers in their late adolescence have better birth outcomes than Black mothers in their 20s and 30s.⁶

While each of the aforementioned factors negatively impacts infant mortality, they alone cannot explain why the gap between Black and White IMR has remained so large. Maternal education and adolescent pregnancy are especially poignant in pointing out the flaw in attributing IMR solely to individual-level factors because increasing these areas does not provide a protective benefit for Black women.

Mechanisms

There are many theories as to why the gap between Black and White IMR is so high in the U.S. The weathering hypothesis states, “the health of African-American women may begin to deteriorate in early adulthood as a physical consequence of cumulative socioeconomic disadvantage.”¹³ In other words, the continued disparities that Black women face over their lifetime accumulates, resulting in declining health at earlier age, including reproductive health.

One way to measure weathering is to use allostatic load, a numerical representation of the cumulative wear and tear on the body’s systems due to repeated adaptation to stressors.¹⁴ There are two categories of biomarkers: primary and secondary mediators. Primary mediators are substances that the body releases in response to stress, such as epinephrine and cortisol levels. Secondary mediators are the effects that result from the actions of primary mediators, such as hypertension, or hyperlipidemia.

Geronimus, et al., analyzed a national sample of young to middle-aged adults to describe age patterns of allostatic load among Black and White participants.¹⁴ They used biomarkers including body mass index, triglycerides, and C-reactive protein, and found that Black participants had higher allostatic load than White participants.¹⁴ Further, Black women had higher allostatic load than Black men.¹⁴

Geronimus offered weathering and allostatic load as an explanation for why the protective effect of education on infant mortality plateaus for Black women after 12 years of education.¹⁵ They theorized that educated Black women may not receive the same protective advantage from infant mortality because of the social interactions they may endure.¹⁵ If Black women with college education spend more time in predominantly White fields, they may be subject to a higher degree of racism.¹⁶ Structural racism in job selection processes, in the workplace, and in their social environments could lead to increased psychological and physiological stress in the form of weathering and allostatic load.¹⁶

Another mechanism is the life course perspective, which presumes that early life experiences can shape health across the lifetime, and potentially across generations. The timing and duration of these experiences plays an important role in shaping the trajectory of health. Exposures at critical developmental timepoints, such as the neonatal or adolescent periods, may have a greater impact on altering the trajectory of health than the same exposures during other timepoints.¹⁵ This perspective focuses on the role of social context over time. According to developmental theory, adverse exposures during the fetal period could lead to “predictive adaptive responses” that change physiology and behavior and can persist into the next life stage.¹⁵ Negative impacts during the pregnancy could lead to infant mortality.¹⁵

What these theories have in common is they attribute stressors to poor health, which can manifest as poor birth outcomes. Stressors, specifically due to race may be attributed to new ideologies of racism, which Dr. Bonilla-Silva terms “colorblind racism.”¹⁶ This mechanism may help explain why the racial disparities seen in IMR for U.S. born Blacks do not follow the same patterns in African born individuals living in the U.S.

Bonilla-Silva details that this newer form of racism is not like Jim Crow-era racism—it is not explicit.¹⁶ Instead, it is dominated by victim blaming in the form of abstract liberalism, naturalization, cultural racism, and minimization of racism.¹⁶ Disparities in the factors affecting IMR (maternal education and depression) are attributed to individuals experiencing these differences. They are written off as either natural occurrences, a product of Black culture, or not relevant in the 21st century. This unwillingness to recognize structural factors leads to a cycle of acceptance of this mindset, and a continued trend of higher IMR in Black women.¹⁶

Using structural racism to correct for the differences between national Black and White IMRs reveals a linear

relationship between racial inequality and Black infant mortality in these measures.⁴ Wallace et al., showed this by comparing the IMR for Black and White populations after correcting for factors such as rates of imprisonment, juvenile detention, unemployment, educational attainment, managerial positions, and median household income to show this relationship.⁴ Black IMRs were associated with the total population median household income, “for every \$12,641 increase in a state’s median household income, the Black infant mortality rate was decreased by 17 percent.”⁴ None of these measures were significantly associated with White infant mortality. These data suggest that societal factors, not individual factors, correlate with outcomes, but only for a disenfranchised group.

Eliminating health disparities

Social factors, such as disparities between maternal education, maternal depression, and adolescent pregnancy are based on individual behaviors and ignore the structural inequalities inherent in the U.S. that prevent a decline in IMR based on race. While these factors do contribute to the problem, they veil the role of structural components in racial disparities of infant mortality. Repeated exposure to structural stressors is a potential explanation of how biology is altered and manifests as differences in reproductive health, i.e., infant mortality. Past, and current, interventions to decrease IMR have been primarily focused at the maternal level, i.e, prenatal care and parental education. These mechanisms suggest that mediations aimed at the social level could also be areas of intervention for lowering IMR, especially in geographical areas where racial disparities are also high for other measures of inequality.

Such trends and solutions have already been applied and/or suggested to address racial disparities amidst the current SARS-CoV-2 pandemic. Black and Hispanic patients’ morbidity due to infection with the novel virus prompted research into factors surrounding these outcomes. Higher incidences of comorbidities and residence in socially disadvantaged neighborhoods were among these factors. Specifically, living in a neighborhood with a long history of social policies, such as redlining, was a factor associated with high rates of SARS-CoV-2 infection.¹⁷ These findings pointed toward social, and away from biological, differences for the disparity in SARS-CoV-2 illness and hospitalization.

To change the outcomes of Black and Hispanic patients, changemakers called for the reformation of health care, education, employment, and housing policies that contribute to health disparities. Additionally, Boulware suggested

new policies to stimulate equity, including universal health care, workplace protections, and programs such as diversity and systemic racism education.¹⁷

References

1. National Center for Chronic Disease Prevention and Health Promotion, Division of Reproductive Health. Infant Mortality. September 8, 2022. <https://www.cdc.gov/reproductivehealth/maternalinfanthealth/infantmortality.htm>.
2. Storeygard A, Balk D, Levy M, Deane G. The Global Distribution of Infant Mortality: A subnational spatial view. *Popul Space Place*. 2008; 14(3): 209-29.
3. Chen A, Oster E, Williams H. Why Is Infant Mortality Higher in the United States Than in Europe? *Am Econ J Econ Policy*. 2016; 8(2): 89-124.
4. Wallace M, Crear-Perry J, Richardson L, Tarver M, Theall K. Separate and unequal: Structural racism and infant mortality in the U.S. *Health Place*. 2017; 45: 140-4.
5. Guyer B, Freedman M, Strobino D, Sondik E. Annual summary of vital statistics: Trends in the health of Americans during the 20th century. *Pediatrics*. 2000; 106(6): 1307-17.
6. Rosenberg K, Desai R, Kan J. Why do foreign-born blacks have lower infant mortality than native-born blacks? New directions in African-American infant mortality research. *J Natl Med Assoc*. 2002; 94(9): 770-8.
7. Segre L, O'Hara M, Losch M. Race/ethnicity and perinatal depressed mood. *J Reproductive and Infant Psychology*. 2006; 24(2): 99-106.
8. Huang Z, Lewin A, SJ M, Zhang J. Variations in the Relationship Between Maternal Depression, Maternal Sensitivity, and Child Attachment by Race/Ethnicity and Nativity: Findings from a Nationally Representative Cohort Study. *Matern Child Health J*. 2012; 16(1): 40-50.
9. Ertel K, Rich-Edwards J, Koenen K. Maternal Depression in the United States: Nationally Representative Rates and Risks. *J Women's Health*. 2011; 20(11): 1609-17.
10. Din-Dzietham R, Hertz-Picciotto I. Infant Mortality Differences between Whites and African Americans: The Effect of Maternal Education. *Am J Public Health*. 1998; 88(4): 651-6.
11. Caldwell J, McDonald P. Influence of maternal education on infant and child mortality: Levels and causes. *Health Policy and Education*. 1982; 2(3-4): 251-67.
12. Gage T, Fang F, O'Neill E, DiRienzo G. Maternal Education, Birth Weight, and Infant Mortality in the United States. *Demography*. 2013; 50(2): 615-35.
13. Geronimus A. The weathering hypothesis and the health of African-American women and infants: evidence and speculations. *Ethnicity & Disease*. 1991; 2(3): 207-21.
14. Geronimus A, Hicken M, Keene D, Bound J. Weathering and Age Patterns of Allostatic Load Scores Among Blacks and Whites in the United States. *AJPH*. 2006. 96(5): 826-33.
15. Jones N, Gilman S, Cheng T, Drury S, Hill C, Geronimus A. Life Course Approaches to the Causes of Health Disparities. *AJPH*. 2019; 109: S48-55.
16. Bonilla-Silva E. *Racism without Racists: Color-Blind Racism and the Persistence of Racial Inequality in America*, 4th ed. Oxford (UK). Rowman & Littlefield Publishers, Inc.; 2014.
17. Boulware LE. Race Disparities in the COVID-19 Pandemic— Solutions Lie in Policy, Not Biology. *JAMA Netw Open*. 2020. 3(8) e2018696.

The author's E-mail address is acs174@case.edu.