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Racial disparity in infant mortality

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ABSTRACT

In the United States, African-American infants have significantly higher mortality than white infants. Previous work has identified associations between individual socioeconomic factors and select community-level factors. In this review, the authors look beyond traditional risk factors for infant mortality and examine the social context of race in this country, in an effort to understand African-American women's long-standing birth outcome disadvantage. In the process, recent insights are highlighted concerning neighborhood-level factors such as crime, segregation, built environment, and institutional racism, other likely causes for the poor outcomes of African-American infants in this country compared with infants in most other industrialized nations.

Background

Infant mortality rate (IMR) is more than a marker of maternal and child health; it is a symbolic benchmark of a society's overall health. By this standard, the United States is deficient with the following 2 striking characteristics: its IMR is high compared with other developed nations, and African-American infants have a 2.2-fold greater mortality rate than white infants.[1] Despite success in increased survival of preterm infants due to advances in obstetric and perinatal medicine over the last 3–4 decades, the U.S. ranking among industrialized countries has plummeted from 6th in the world to 26th in the past 50 years.[2] During the same period, the African-American/white infant mortality ratio has also increased from 1.6 to 2.2.

Many observers suggest that these statistics are misleading because of international differences in the completeness of reporting of mortality, especially deaths at the threshold of viability, and variable birth registration requirements in other countries. However, even when births less than 22 weeks' gestation are excluded, the preterm birth rate in the United States still exceeds that of Europe, and U.S. infant mortality rate remains greater than that of most European countries.[3] In fact, the high preterm birth (<37 weeks' gestation, PTB) rate in the United States explains most of our nation's low international standing in IMR. The percentage of PTB in the United States has risen more than 20% since 1990, and 36% since the early 1980s,[4] and the United States compares favorably with Europe in the survival of infants born preterm (Fig. 1). Preterm infants have much higher rates of death or disability than infants born at 37 weeks of gestation or more, so the United States' higher percentage of preterm births has a large impact on IMR.

Disorders related to short gestation (<37 weeks) and low birth weight (<2500 g, LBW) are the leading cause of death for all African-American infants, whereas congenital malformations are the leading cause of death for white infants. The African-American/white mortality rate ratios range from 1.2 for congenital malformations to 3.5 for disorders of short gestation.[1] Short gestation, or prematurity, is tightly linked with LBW and particularly with very low birth weight (VLBW; <1500 g). Importantly, LBW is a strong determinant of first-year mortality and contributes to the racial disparity in IMR.[1] Most pertinently, the approximately 1% of births occurring at a VLBW account for more than half of infant deaths and nearly

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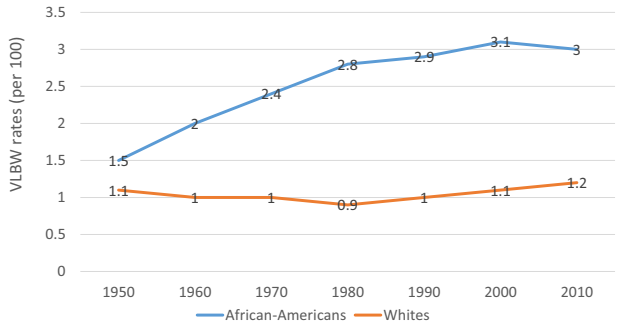

Fig. 1 – Seven decade trend in VLBW rates in the United States.

two-thirds of the racial gap in infant mortality.[1] Among both African Americans and whites, the rates of VLBW has steadily increased in the last decades, but in 2013, African Americans had a VLBW rate of 2.8% compared to 1.1% for whites.[4]

Interestingly, the racial disparity persists among term infants. The leading causes of first-year mortality for African-American and white term infants are congenital malformations, sudden infant-death syndrome, and accidents (unintentional injuries).[1] The mortality disadvantage of African-American term infants exists across all the major categories.

Progress has been made in understanding the complicated issue of race, birth weight, and infant mortality, but challenges remain to identify and eliminate the effects of life-long underserved minority status on women's health. The objective of this review is to look beyond traditional individual risk factors for infant mortality and examine the social context of race in this country, in an effort to understand African-American women's long-standing birth outcome disadvantage (Fig. 2). In the process, we highlight new approaches to capture the social determinants of the racial disparity in IMR.

Race and geographic ancestry

Race has been viewed as a proxy for geographic ancestry, and some investigators have argued that disparities in birth outcomes result from genetic differences between African-American and white women because statistical adjustment for socioeconomic factors did not fully eliminate racial disparities in infant mortality.[5,6] However, this now seems implausible, since more than 90% of human genetic variation is found within the population of any continent, with only an additional 5–10% accounted for by differences in gene frequencies among continental populations.[7,8] Rather than a traditional genetic concept, race should be viewed as a social construct. As such, social, economic, and cultural processes across the life-course are hypothesized to adversely impact historically disadvantaged populations in a multilayered manner.[9–11]

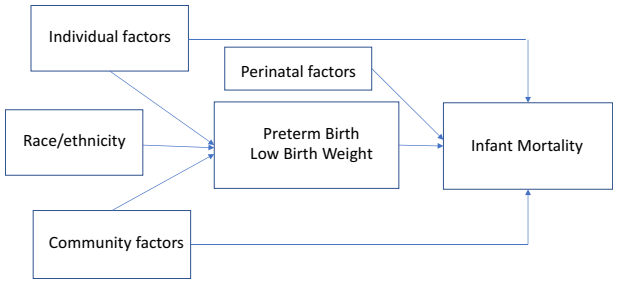

Fig. 2 – Conceptual framework for the relationship between individual and community factors, race/ethnicity, and infant mortality. (Adapted with permission from Lorch S, Enlow E. The role of social determinants in explaining racial/ethnic disparities in perinatal outcomes. Ped Res. 2016;79(1):141-147.)

The investigation of immigrant women and their U.S.-born descendants strongly supports this conceptual model. Using Illinois vital records, we have found that the rates of LBW and VLBW among sub-Saharan African-born black women were less than that of U.S.-born black women and approximated that of U.S.-born white women.[12] In a follow-up investigation, we reported that the birth weight of the U.S.-born female descendants of European-born white women increased across a generation.[12] The opposite phenomenon occurred among the U.S.-born descendants of African/Caribbean-born black women, suggesting that an element closely related to life-long minority status is a risk factor for PTB.[13] Similarly, Fang et al.[14] have described births in New York City in which, within poor neighborhoods, immigrant black mothers had lower LBW rates than U.S.-born black mothers.

Traditional/individual factors

Young maternal age, low education attainment, low income, unmarried marital status, short interpregnancy interval, health-eroding personal behaviors (cigarette smoking, alcohol intake, and illicit drug use), and inadequate prenatal care are well-documented risk factors for preterm birth and LBW.[15–18] Yet, multiple studies have found that the racial disparity in the rates of PTB, LBW, and first-year mortality are independent of these traditional individual-level risk factors.[15,19,20] The racial disparity in adverse birth outcome actually widens as women's sociodemographic status, medical status, and behavioral status improves. Of particular note, college-graduated African-American (compared to white) women who receive adequate prenatal care still have more than a 2-fold greater LBW rate.[21] Other speculated individual-level factors that contribute to racial disparity in infant mortality include prenatal care utilization,[22] participation in prenatal Women, Infants, and Children (WIC) program,[23] and paternal involvement in child-rearing.[24]

A limited literature shows that IMR of full-term African-American infants exceeds that of whites.[1] For term infants, congenital anomalies, SIDS, and injuries are the leading causes of death. Among congenital anomalies, congenital heart disease (CHD) is the leading cause of death. Using national vital records, a prior study recently found that term infants with U.S.-born African-American (compared to white) mothers had a 40% greater first-year mortality rate due to CHD independent of maternal age, education attainment, prenatal care usage, and region of residence. This disparity was widest during in the postneonatal (28–365 day) period, suggesting a neighborhood phenomenon.[25]