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Racial disparities in cardiovascular health linked to birth weight, slavery

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Two new articles examine the theory of "fetal programming" and their effect on racial health disparities. The studies, published in *American Journal of Human Biology,* suggest that the higher rates of hypertension and cardiovascular disease present in African Americans may be a consequence of low birth weights, and that these low birth weights may be a result of social rather than genetic factors.

It is well-established that the nutritional and psychological state of a pregnant mother can influence whether her child will later develop cardiovascular disease as an adult. Nutrients and hormones present in the womb shape a fetus's development, in part by silencing certain genes in the body. These influences can persist into later life to impact adult health. Researchers from Northwestern University argue that such intergenerational impacts of environmental factors could help explain black-white differences in cardiovascular health in the U.S.

"A pregnant African American mother's experience of well documented stressors, including social forces such as discrimination and racism, could have lingering effects on diseases like hypertension, diabetes and heart attacks in her children," says Christopher Kuzawa and Elizabeth Sweet, who co-authored this piece. By synthesizing this new evidence, they argue that social forces, rather than genes, may underlie the problem of racial inequity in heart attacks and strokes in the U.S.

In a related editorial in the journal, Peter Ellison, Editor-in-Chief, explains that some of the most persistent health disparities in the United

States occur between African Americans and European Americans. The causes of those disparities are many and their roots are deep. They are entwined with the history of slavery and discrimination, with rural and inner city neglect, with differential wealth and differential access to health care, with cultural traditions and cultural biases, according to Ellison.

A second study in the Journal states that the average birth weight among African-American babies is approximately 250 grams lower than the average birth weight of whites, a difference that represents nearly 10 percent of an average infant's body weight. According to Grazyna Jasienska, co-author of the study, this may also be the result of conditions experienced by their ancestors during the period of slavery passed through epigenetic, rather than genetic, mechanisms.

Current socio-economic conditions which are, on average, worse for African-Americans, can explain only part of the observed birth weight variation, according to Jasienska. Nor is there reason to think that lower birth weight of African-Americans is due to original African genetic heritage. Prior studies have shown that contemporary black women who were born in African countries ancestral to slave populations, but who live in the U.S., give birth to children with significantly higher weight than black women in the U.S. who have slave ancestry.

"Slaves experienced poor nutrition during all stages of life, suffered from a heavy burden of infectious diseases and, in addition, experienced high energetic costs of hard physical labor," says Jasienska. "Even a short-term nutritional deprivation of pregnant women, when very severe, has been shown to have an intergenerational effect," says Jasienska. Dutch women exposed to famine as fetuses in mid- and late gestation have also been shown to have reduced birth weights, and the effect was detectable years later because birth weight of their children was also reduced.

The fetal programming concept suggests that physiology and metabolism, including growth and fat accumulation of the developing fetus, and, thus its birth weight, depend on intergenerational signal of environmental quality passed through generations of matrilinear ancestors.

A child's birth weight depends on the condition of his or her mother during pregnancy but also, recent research indicates, on the conditions the mother faced as a child and even as a fetus. As a result, a child's birth weight may be influenced by nutritional conditions of its grandmother and even great-grandmother. The resulting effects can be seen in both childhood and adulthood, and include a higher risk of hypertension, diabetes and cardiovascular disease.

Jasienska states that, in the U.S. , the condition of many slaves did not immediately improve after the abolition of slavery, so the causes are not as far removed in time from contemporary African Americans as it may seem. Census data from the year 1900 showed that African Americans continued to suffer higher mortality than whites from all major diseases except cancer. Even though several generations have passed since then, it may not have been enough time to eliminate the negative impact of slavery on the health of the contemporary African-American population.

Source: Wiley