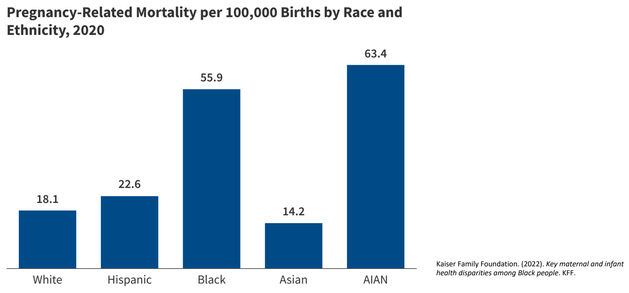
Why the Black Infant Mortality Rate is Higher in Indianapolis: A Clinical View

Mankirth Singh
Tom and Julie Wood College of Osteopathic Medicine
3200 Cold Spring Rd, Indianapolis, IN 46222

Maternal Health Disparities

• Black mothers experience higher rates of chronic hypertension, diabetes, and obesity. All conditions connected to microvascular injury and endothelial dysfunction (Fiscella, 2004).
• Allostatic load research demonstrates that chronic psychosocial stress accumulates biologically, leading to dysregulated cardiovascular and immune pathways (Wallace & Harville, 2013).
• Increased rates of preeclampsia, gestational hypertension, and reduced placental blood flow directly increased risk of medically indicated or spontaneous preterm birth (Matoba et al., 2021).

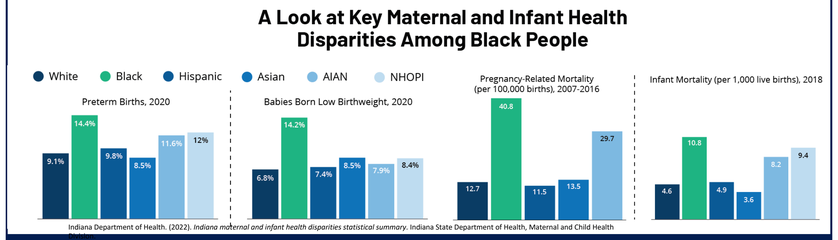


Indianapolis-Specific Disparities

• Neighborhoods in Indianapolis including Martindale, Brightwood, Haughville, and Riverside still reflect historic red-lining and disinvestment, creating unequal exposure to stressors, pollution, and poor living conditions (Hailu et al., 2022).
• ZIP codes in Marion County with the highest Black infant mortality rates often coincide with lower access to obstetric specialists and maternal fetal care clinics (Chiang et al., 2019).
• Black mothers in Indianapolis are more likely to live near major highway corridors such as I-65, I-70, and I-465. Elevated air pollution in these areas contribute to vascular and microvascular endothelial damage (Hailu et al., 2022).
• Food deserts and fewer fresh food outlets exist in many predominantly Black Indianapolis communities, increasing cardiometabolic risk for pregnant women such as hypertension, obesity, and diabetes which impairs placental function (Chiang et al., 2019).

Proposed Interventions

• Implement early pregnancy vascular risk screening using blood pressure monitoring, placental Doppler imaging, and cardiometabolic assessments for high-risk mothers (Matoba et al., 2019).
• Expand access to culturally-informed prenatal support such as doulas, maternal health navigators, and community-based perinatal education programs (Chiang et al., 2019).
• Increase availability and distribution of maternal-fetal medicine specialists and high-quality prenatal clinics in underserved Indianapolis ZIP codes (Hailu et al., 2022).
• Address upstream determinants through policies that improve food access, reduce environmental exposure, and enhance transportation for prenatal appointments (Fiscella, 2004).
• Build partnerships between hospitals, public health departments, universities, and community organizations to sustain long-term equity-focused maternal care initiatives (Chiang et al., 2019).

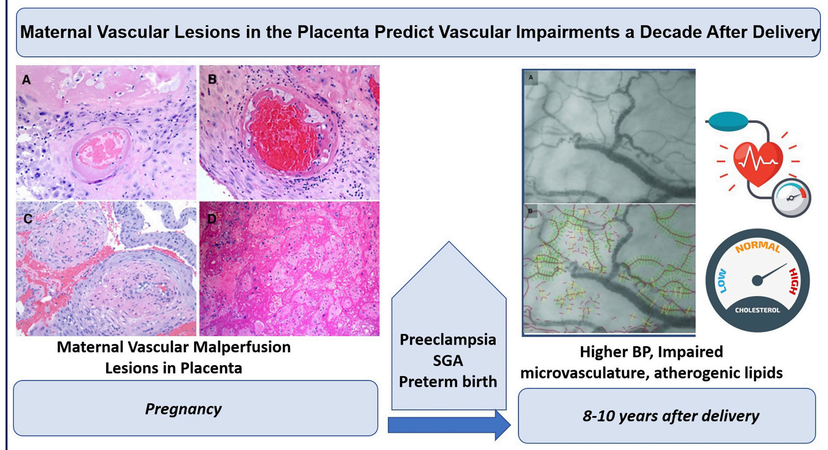


Infant Outcomes

• Infants are at increased risk for preterm birth and low birth weight when placental blood flow and vascular function are compromised, limiting adequate oxygen and nutrient delivery (Matoba et al., 2021).
• Higher rates of neonatal complications such as respiratory distress, infection susceptibility, and extended NICU stays are linked to placental insufficiency and intrauterine growth restriction (Matoba et al., 2019).
• Prematurity and early developmental challenges significantly contribute to the elevated infant mortality rate among Black newborns in Indianapolis, reflecting both biological and systemic disparities (Fiscella, 2004).

Mechanisms of Placental Dysfunction

• Disturbed blood flow and impaired endothelial signaling reduce nitric oxide availability, mirroring early atherosclerotic changes described in endothelial research (Singh et al., 2024).
• Abnormal trophoblast invasion and spiral artery remodeling lead to reduced placental perfusion, hypoxia, and oxidative stress (Matoba et al., 2019).
• Microvascular dysfunction creates an inflammatory environment that increases risk of preeclampsia, fetal growth restriction, and spontaneous preterm labor (Matoba et al., 2021).



• The image illustrates how abnormalities in placental vascular remodeling and maternal blood flow can lead to reduced nutrient and oxygen delivery, which is consistent with endothelial dysfunction and disturbed shear stress pathways described in current vascular research.
• Visual evidence of impaired spiral artery transformation supports the link between maternal vascular perfusion and increased risks of preeclampsia, fetal growth restriction, and preterm birth, all of which disproportionately affect Black mothers in Indianapolis.

Literature Cited