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Exploring the social determinants of racial/ethnic disparities in prenatal care utilization and maternal outcome

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ABSTRACT

Rates of maternal morbidity and mortality are rising in the United States. Non-Hispanic Black women are at highest risk for these outcomes compared to those of other race/ethnicities. Black women are also more likely to be late to prenatal care or be inadequate users of prenatal care. Prenatal care can engage those at risk and potentially influence perinatal outcomes but further research on the link between prenatal care and maternal outcomes is needed. The objective of this article is to review literature illuminating the relationship between prenatal care utilization, social determinants of health, and racial disparities in maternal outcome. We present a theoretical framework connecting the complex factors that may link race, social context, prenatal care utilization, and maternal morbidity/mortality. Prenatal care innovations showing potential to engage with the social determinants of maternal health and address disparities and priorities for future research are reviewed.

Racial disparities in maternal morbidity and mortality

Maternal mortality, defined as the death of a woman while pregnant or within 1 year of pregnancy from any cause related to or aggravated by pregnancy or its management, is rising in the United States (US).[1] Non-Hispanic Black women have had the most notable increases in maternal mortality between 2007 and 2014.[2] The rate of occurrence of severe maternal morbidity, or conditions that predispose pregnant and postpartum women to life-threatening complications, has also increased in the United States.[3] Non-Hispanic Black women have significantly higher rates of 22 of 25 specific severe morbidity indicators. Black women dying of pregnancy-related causes are younger, less educated, and more likely to be unmarried and to have an in-hospital death than non-Hispanic White women.[4–6]

Prenatal care can be used to engage patients early in pregnancy and provide risk assessment and psychosocial, cultural, and educational support with the ultimate goal of improving pregnancy outcomes. While Black, Hispanic, and Native American women are all at risk for late entry into prenatal care, Black women alone are at significantly higher risk for maternal death,[7] calling for careful examination of the relationship between prenatal care utilization and disparities in maternal health outcome.

Categories of race and ethnicity do not represent differences in individual behaviors or biology, but rather acknowledge historic inequities implicated in health outcomes.[8] For the purposes of this article, we assume race and ethnicity to

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be social constructs closely related to the social determinants of health, rather than biological or genetic categories,[7,9] as well as constructs that may intersect with health care utilization, social determinants, and medical risk to generate observable differences in maternal health outcome. We understand disparities to be differences in treatment and access not explained by differences in health status or individual preference.[10]

Understanding the underlying mechanisms of disparities in maternal outcome is crucial for development of preventive interventions in partnership with those most at risk. This article will focus on key published findings relating to the relationship between prenatal care utilization, social determinants of health, and disparate maternal outcome by race/ethnicity. Utilizing a social justice framework that focuses on those differences "that society has a role in creating, and therefore has the greatest potential to ameliorate,"[11] we close with a discussion of innovations in prenatal care delivery that may offer this potential.

The social determinants of maternal health

Healthy People 2020 defines the social determinants of health as the conditions in which we are born, live, learn, work, play, worship, and age. These conditions may impact a range of health, functioning, and quality-of-life outcomes and risks.[12] The World Health Organization[13] and the United Nations Development Program[14] have both described frameworks to analyze structural and social determinants of maternal health; we will describe salient aspects of these frameworks based on our review of US data.

Our understanding of the psychosocial factors that contribute to maternal morbidity and mortality is still evolving. Rising rates of pregnancy-related death and severe maternal morbidity are thought to be driven by cardiovascular disease[4] and obesity.[6] Studies have also identified the presence of factors such as substance use, severe mental illness, and intimate partner violence to be significant predictors of high psychosocial stress during pregnancy[15] and pregnancy-associated death (death that occurs within a year of pregnancy due to any cause).[9,16–20] Substance use disorders in particular may coincide with medical and social vulnerabilities to increase risk of maternal mortality.[6,21] At a local level, racial disparities may be more observable in pregnancy-associated compared to pregnancy-related deaths.[22] Based on available literature, and informed by existing models, we propose a pathway by which race, psychosocial factors, and medical comorbidities may bi-directionally interact with social determinants to impact maternal outcomes such as pregnancy-related death, pregnancy-associated death, and maternal morbidity[23] as shown in the Figure.

Does prenatal care utilization impact maternal outcomes?

Prenatal care was initially proposed at the turn of the last century to address low infant birth weight,[24,25] and evolved to address a maternal outcome very relevant to modern day

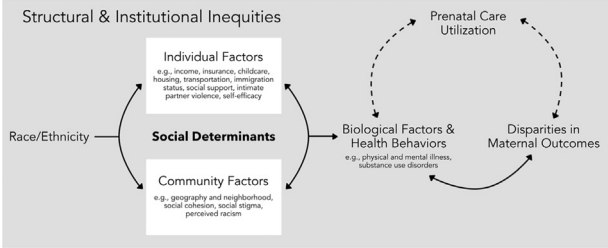

Fig – Conceptual framework for the relationship between race/ethnicity, individual and community-level social determinants of health, and maternal outcomes. These relationships occur against a backdrop of historical structural and institutional inequities. Bi-directional arrows demonstrate the complex interaction of different social determinants in determining the ultimate pregnancy outcome. Dashed arrows represent the uncertainty that still remains in our understanding of the mechanism through which prenatal care utilization interacts with this relationship.

maternal health disparities—preeclampsia.[26,27] Wider implementation of prenatal care in the United States in the 1980s was in response to a hypothesized link between prenatal care, infant birth weight, and infant mortality[28] that has since been challenged,[29] and is uncertain given lack of randomized or pseudo-randomized evaluation.[30] Larger studies of the value of prenatal care are limited by the information in large administrative datasets, the unclear role of selection bias in that those who adequately use prenatal care may be healthier at baseline, and the use of non-comparable, historical controls.

Though adequate use of prenatal care as defined by the widely used Kotelchuck Adequacy of Prenatal Care Utilization (APNCU) index has been found to be significantly associated with infant outcomes, particularly gestational age at delivery and birth weight,[31,32] such a relationship with maternal outcomes and overall cost-effectiveness has been difficult to establish.[33–35] The APNCU index modified the previously used Kessner index to define adequate prenatal care by month of care initiation as well as the expected, appropriate number of visits after initiation of care.[36,37] The APNCU index does not specify which services may be most necessary to reduce maternal morbidity or mortality (e.g., treatment of anemia or reduction of blood pressure[38]) nor does it account for the possible need for increased care if a woman is high risk for poor outcomes.[39] This gap in knowledge is exacerbated by the limitations of commonly used quality measures for prenatal care—that is, time of initiation of prenatal care, postpartum follow-up rate, and frequency of Medicaid-covered prenatal visits—measures which do not have a clear correlation with maternal morbidity or mortality.[40,41]

Convincing data does show that having four or fewer prenatal visits is associated with maternal mortality and that Black women are at disproportionate risk for this outcome.[2] Centers for Disease Control data from the Pregnancy Mortality Surveillance System (PRAMS) also demonstrates that Black and Hispanic women dying of pregnancy-related causes are more likely to initiate prenatal care in the second and third trimesters than White women.[4] Provision of prenatal care by public health departments has been found to be associated with decline in Black maternal mortality rates in an