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Social disadvantage and its effect on maternal and newborn health

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Abstract

Social disadvantage impacts the health of women and newborns throughout the life course. Contributing factors such as low educational attainment, unemployment, poverty, and lack of health insurance disproportionately affects minority women of reproductive age in the United States. This article reviews social disadvantage as it contributes to health status and health disparities for mothers and newborns in the United States and highlights the opportunities to improve social and structural determinants of health to address these gaps.

Keywords

Socio-economic status; Racism; Disparities; Social determinants of health; Poverty; Maternal health

Introduction/Background

Social disadvantage affects health outcomes throughout the lifespan;[1,2] maternal and newborn health is particularly susceptible and the effects can be sustained across generations.[3,4] Health is impacted by factors beyond individual genetics and biology. Social, economic, environmental, and structural factors impact individual as well as population health.[5] These factors, which include lower education levels, poverty, reduced employment opportunities, and experiences of discrimination, can vary considerably based on age, ethnicity/race, sex/gender, disability, and geographic residence.[6]

Drivers of social disadvantage

Economic hardship is a major contributor to social disadvantage. In 2018, 11.5 million families with children (15.9% of all families) were below the federal poverty level.[7] Among these, 3.1 million were white non-Hispanic (8.6% of white non-Hispanic families), 3.2 million were black non-Hispanic (29.4% of black non-Hispanic families), and 4.3 million were Hispanic (23.4% of Hispanic families).[7] More females than males live in poverty;

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of the 38.1 million people in poverty, 56% are women and nearly half of these women experience deep poverty, defined as falling below 50 percent of the federal poverty line.[7,8] Compared to their male counterparts and among all races and ethnicities, American Indian or Alaska Native (AI/AN) women experience the highest rates of poverty.[8]

AI/AN, Black, and Hispanic women may also experience additional social disavantages due to social constructs such as sexism and racism within institutional systems that result in lower wages, inability to accumulate wealth, limited occupational advancement, and predatory lending.[8,9] In addition, U.S. women of reproductive age, particularly those who are AI/AN, Black, and Hispanic, are often the designated primary caregiver of children, and the single head of the household.[10] Unlike in other developed countries, policies that may support working families, such as paid sick leave, family and medical leave, and childcare subsidies are more limited in the U.S., despite increasing evidence of their effectiveness.[11–16] Although low-income women of reproductive age may be eligible for Medicaid coverage while pregnant, they often lose this coverage within 6 to 8 weeks after delivery.[17]

Race, ethnicity, and social disadvantage

In the United States, race is so inextricably linked to social status that even well-educated, high income black mothers and their infants experience health outcomes similar or worse than white women who are more economically disadvantaged.[18–20] Numerous studies have tied indicators of social disadvantage with worse maternal and infant outcomes including for socio-economic status,[21] intergenerational wealth,[22] discrimination,[23] and other factors such as social deprivation,[24,25] and hypersegregation.[26] Amongst the clearest studies that establish the influence of social context on birth outcomes, a 1993 study of births in Illinois by James Collins, demonstrated that, among biracial couples (white mom, black dad; black mom, white dad), black mothers had higher rates of low birth weight among their biracial infants, despite adjustment for age and education.[27] These studies demonstrate that the lived experience of black women, before and during pregnancy affects perinatal outcomes.

Data from CDC's *Pregnancy Mortality Surveillance System* (PMSS) shows that racial and ethnic inequities in pregnancy-related death persist despite maternal age and education.[20,28] Disparities in pregnancy-related mortality ratios worsen with increasing age; black and AI/AN women older than 30 years are four to five times more likely to die than their white counterparts.[28] Increased disparity by age supports the "weathering" hypothesis which proposes that black women experience earlier deterioration of health because of the cumulative impact of exposure to psychosocial, economic, and environmental stressors affecting allostatic load.[29,30] PMSS data also shows that racial and ethnic disparities persist among women with higher maternal education, even in states with the lowest pregnancy related mortality ratios.[31] The potentially protective factor of education does not reduce disparities for all women. In fact, black women with a college education have higher rates of pregnancy-related mortality than white women with less than a high school degree, further noting that social context matters (Fig. 1).[31]

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Social disadvantage through the life course

A woman living within an environment of social disadvantage is at higher risk for pregnancy complications such as preterm delivery, congenital anomalies, and perinatal asphyxia, which can result in long term physical and developmental sequelae for the newborn that can further exacerbate social disadvantage.[32] Impacts of adverse neonatal outcomes can persist into childhood and is associated with chronic disease in adulthood, perpetuating a cycle of of social disadvantage due to physical and intellectual disability for children, and financial and emotional stress to families.[33–34] Poverty can independently contribute to adverse developmental outcomes. A study by Beuregard et al, assessed a cohort of preterm and term infants in the United Kingdom and found that preterm infants living in a family with low socioeconomic status tended to score lower on cognitive assessments at 3, 5, and 7 years of age compared with term infants.[35] But the researchers also found that term children who were living in families with poverty had lower cognitive scores than preterm children who were not living in poor families[35] (Fig. 2).

Low-income women are less likely to have health insurance prior to pregnancy.[17] In the United States in 2017, 7.5 million (11.7%) women aged 15 to 44 years were without health insurance and although this is an improvement since 2013, insurance coverage varies due to differences in state Medicaid expansion and private insurance.[17] Due to gaps in insurance coverage and other financial barriers, low income women may not have access to services ranging from quality contraceptive services to in-vitro fertilization. For example, long-acting reversible contraception (LARC) in the immediate postpartum period, has been shown to reduce rapid repeat pregnancy as improved pregnancy spacing helps prevent preterm birth.[36,37] However, insurance reimbursement for immediate post-partum LARC insertion is often insufficient to cover the costs of contraceptive devices and provider services.[38] Low income women may lose insurance within 6 weeks post-partum, a time where they may need additional follow up care. On the other end of the spectrum, infertility affects millions of couples[39] and approximately 12% of women of reproductive age in the United States [40] and, yet infertility treatment is expensive and often limited to couples with higher incomes and wealth. According to a study by Chambers et al, the cost of an assisted reproductive technology (ART) cycle was over $12,000.[41] ART treatment also includes additional costs such as ovarian stimulation, retrieval, cryopreservation, and time away from work.[42]

Social disadvantage is associated with unequal access to care to include basic preventive services as well as technological advances in treatment. Diabetes, heart disease, and obesity are increasingly affecting women during their reproductive years.[43–46] Chronic and multiple medical conditions contribute to premature death resulting in an erosion of community resources.[47]

Improving measurement of social disadvantage

Data modernization efforts have the potential to improve maternal and newborn health through the use of robust data to better identify population needs. Our challenge will be to broaden the focus beyond clinical data and utilize additional information on population demographics, zipcode level information on economic opportunity and neighborhood deprivation, environmental factors (e.g. air pollution) and community resource data. By

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combining multiple data sources, there is an opportunity to evaluate non-clinical factors that contribute to adverse maternal and newborn health outcomes and assess opportunities for effective community and population interventions. As an example, the use of the maternal mortality review information and application system (MMRIA) allows maternal mortality review committees to assess a rich array of information including clinical, behavioral, social, and environmental factors that has improved our understanding of the contributors to pregnancy related deaths and suggests recommendations for prevention that capture this community context.[48]

However, the measurement of social disadvantage can be challenging. We also need better measures of wealth vs. income. We need to avoid the methodological error in listing "race" as a risk factor. Race is a social construct and proxy for social disadvantage. In some areas of research, stratification by race may be more informative in uncovering contributions to adverse minority health as opposed to controlling for it as a confounder.[49]

Addressing social determinants to reduce social disadvantage

Social determinants of health are conditions under which individuals are born, grow, live, work, and age.[50] These social determinants include resources, driven by economics, social policies, and politics that affect these conditions, and these conditions impact health inequity. Addressing social determinants of health may offer opportunities to reduce disparities in maternal and newborn health,[51,52] but broader actions are needed before and after labor and delivery or neonatal intensive care admission to address health inequities (Table 1).

Adverse social determinants of health affect the health of entire populations and affect women's health independent of pregnancy. However for pregnant women, factors such as food insecurity, inadequate transportation, rural residence, exposure to tobacco and other environmental hazards, discrimination, and violence may also contribute to pregnancy-related and infant mortality and morbidity, and thus ongoing and future chronic medical conditions.[53,54]

Diminishing the effects of social disadvantage requires intentional efforts to address social determinants of health. Similar to the principles of risk-appropriate care where levels of risk for poor outcomes is assessed for clinical care, high-risk families, mothers, and newborns need additional focus in research, preventive services, primary care and community interventions. Clinical and population level opportunities exist to improved public health and reduce the effects of social disadvantage. The public health impact pyramid, developed by Thomas Frieden, illustrates how interventions at a population level may provide greater impact than individual interventions.[55] Frieden's public health impact pyramid can be adapted for maternal and newborn health (Fig. 3).

Providers may think that they cannot address social determinants of health, but they operate in day to day functioning within our clinics, hospitals, and intensive care units. It is important to look systematically at actions that can be taken to reduce social disadvantage. Horbar and colleagues, in a recent publication, provide a list framed to address social determinants of health, through potentially better practices, PBP's, that can be adapted to

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neonatal intensive care units.[56] These same principles can be applied to perinatal providers to improve social determinants of health for mothers and newborns in maternity clinics, maternal and child health programs, and primary care settings. At a population level, the state of Rhode Island provided priorities, strategies, and actions to improve social determinants of health through Health Equity Zones.[57] These principles were applied more broadly to improve health in numerous communities through the Association of State and Territorial Health Officials in the form of a President's Challenge to Build Strong and Healthy Communities.[58,59] Additionally population level strategies such as Medicaid coverage beyond the immediate postpartum period,[60] paid parental leave,[11–16] earned income tax credit,[61] and payment during pregnancy,[62] show broader impacts to improving the health of mothers and newborns.

Summary

Social disadvantage is a major driver of adverse health outcomes in maternal and newborn health. Addressing social and structural determinants of health can reduce social disadvantage and improve health outcomes.

Disclaimer

The findings and conclusions in this article are those of the author and do not necessarily represent the official position of the Centers for Disease Control and Prevention (CDC).

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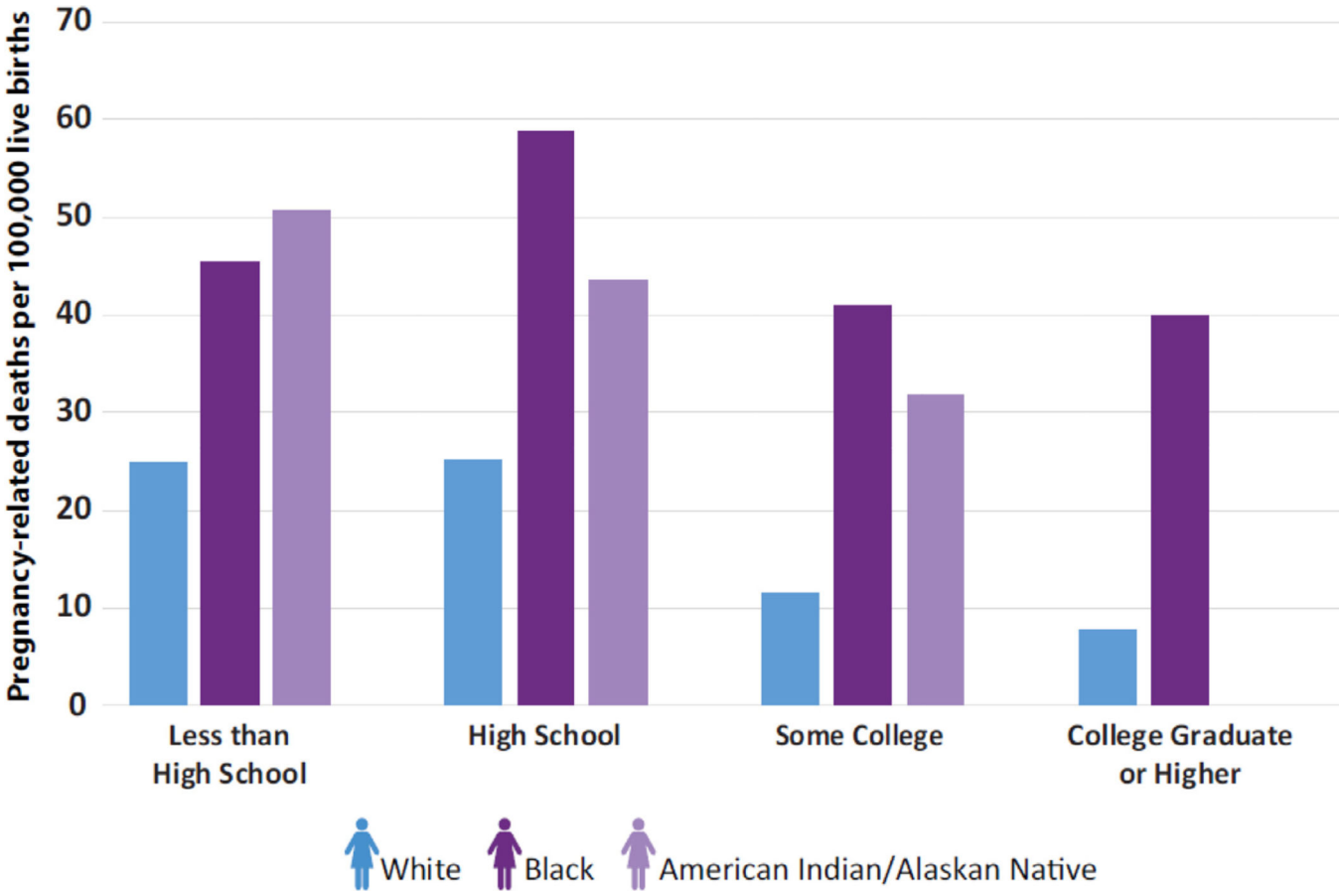

Fig. 1 –.

Pregnancy-Related Mortality Ratio (PRMR) by Race/Ethnicity and Education—United States, 2007—2016.Source: Centers for Disease Control and Prevention. Racial/Ethnic Disparities in Pregnancy-Related Deaths — United States, 2007—2016.

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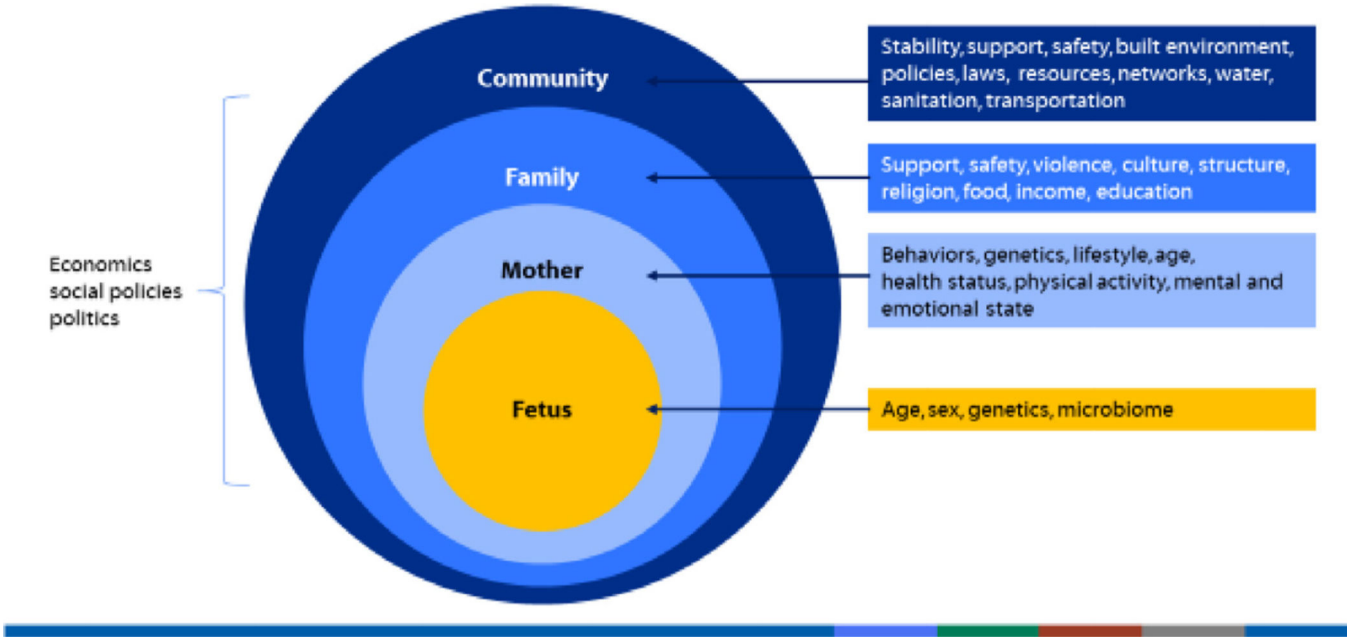

Fig. 2 –.
The circle of influences in perinatal health.

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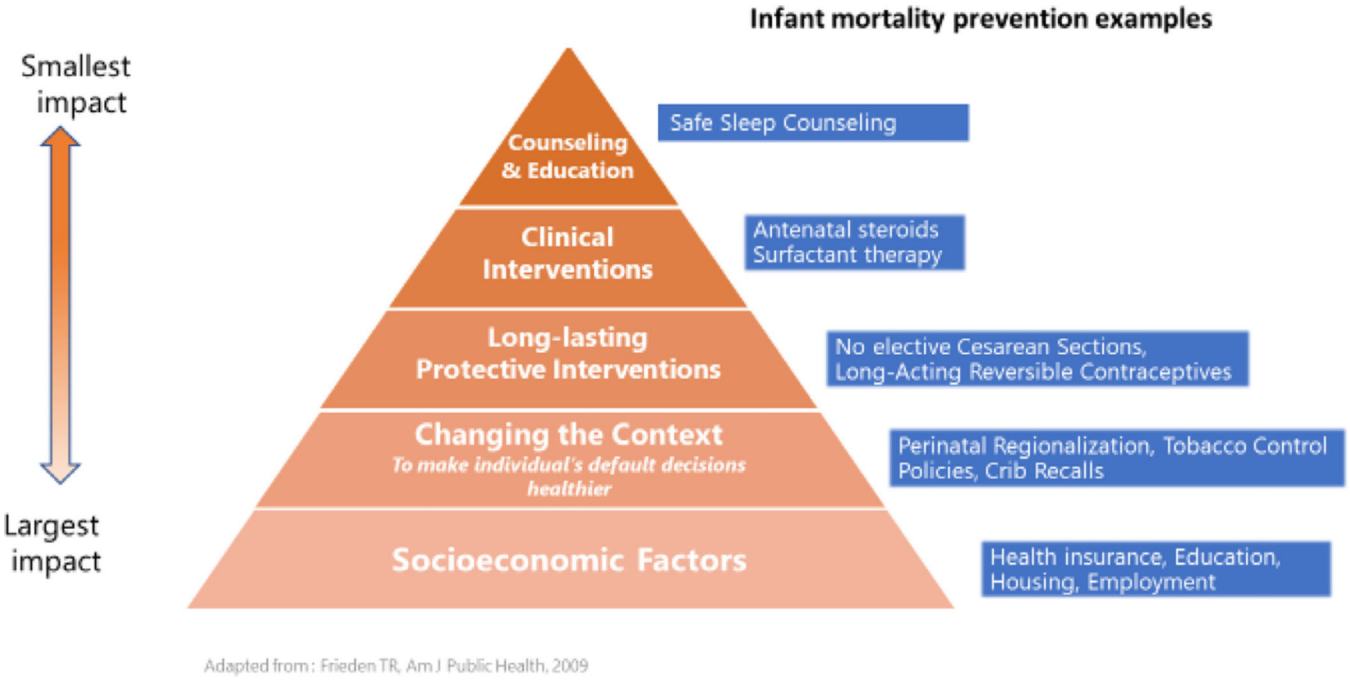

Fig. 3 –.
Public health impact pyramid for infant mortality prevention.

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Table 1 –

Improving social determinants of health for mothers and newborns.

Priorities	Strategies	Perinatal Population Health Goals
• Address Social Determinants of Health	Promote Healthy Living Through the Life Course	-Reduce obesity in pregnant women, infants, children, adults -Reduce chronic illnesses (e.g. diabetes, asthma, hypertension) -Promote the health of mothers and children -Promote behavioral health and wellness
• Eliminate Disparities in Health and Promote Health Equity	Ensure Access to Safe and Healthy Food	-Increase access to safe, affordable, healthy food -Reduce environmental toxic substances (e.g. tobacco, lead) -Improve the availability of affordable healthy housing and safe living conditions
	Promote a comprehensive health system that a person can navigate, access, and afford	-Improve access to health care systems including physical, dental and mental health -Build a well-trained and culturally competent healthcare system of providers -Increase parent and caregiver involvement in care systems -Improve health literacy
• Ensure Access to Quality Health Services	Prevent investigate and control health threats	-Reduce communicable diseases (e.g. HIV, congenital syphilis, Hepatitis C) -Reduce substance use disorders and neonatal opioid withdrawal syndrome -Improve public health response to emergencies -minimize exposures to adverse childhood experiences
	Analyze and communicate data to improve the public's health	-Ensure consistent collection of quality public health data -Analyze public health data to monitor trends, identify emerging problems, and identify populations at risk -Provide and utilize public health data to support program planning, policy development, and surveillance needs