



Preterm Births: Contributing Factors and Comparative Analysis

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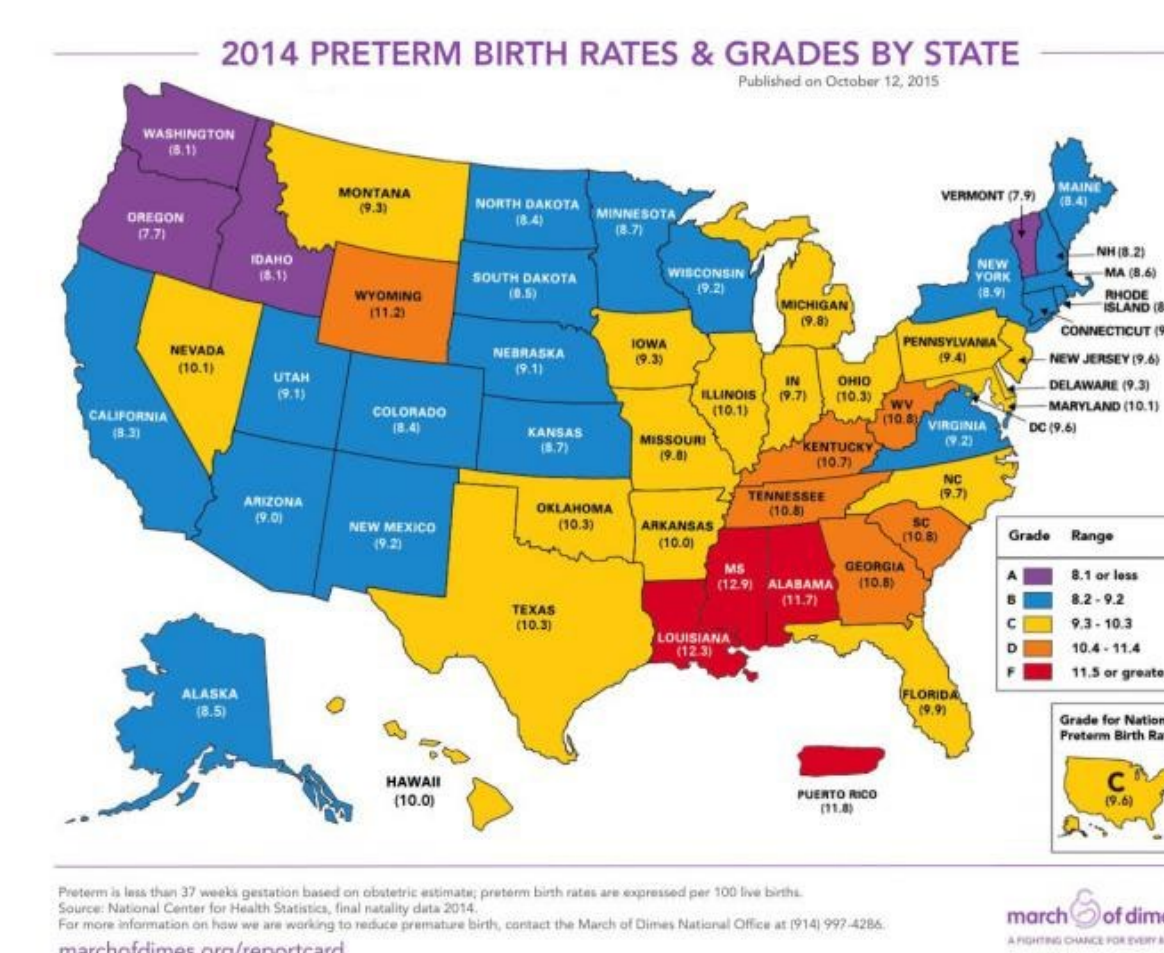
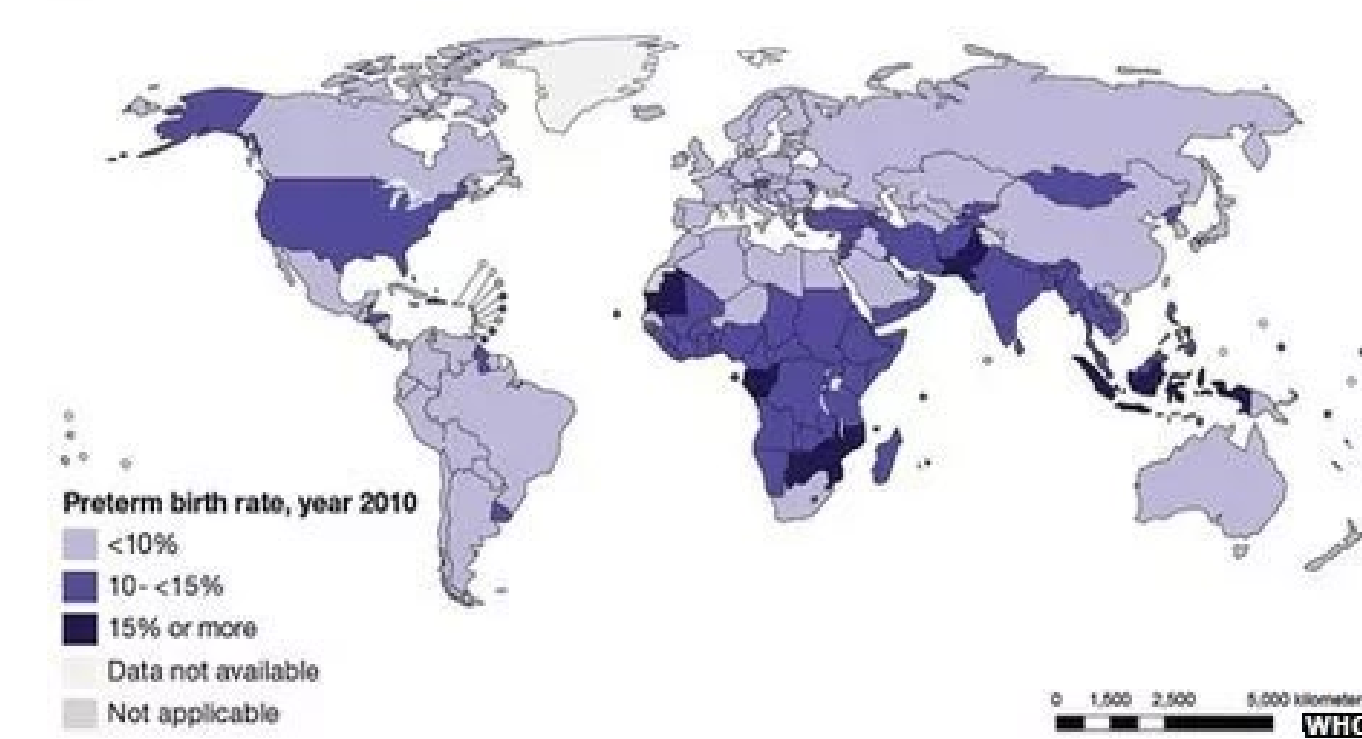
Abstract

According to the World Health Organization (WHO), maternal and infant health is one of the greatest indicators of the health of a nation (2012). In terms of key indicators for maternal and infant health, specifically infant mortality, the United States lags behind comparable nations with significantly worse birth outcomes (WHO, 2011). The infant mortality rate in the U.S. is about 6 per 1,000 live births, more than double the rate of infant mortality in Sweden, Finland, Norway, Japan, South Korea, and Singapore (CIA, 2017), despite the fact that the U.S. spends a greater proportion of its GDP on healthcare than other comparable nations (Sawyer and Cox, 2018). The greatest contributing factor to a higher infant mortality in the United States is the high rate of preterm births (CDC, 2009). In fact, research identified that preterm births replaced infectious disease in 2014 as the most common killer of children under five years old (Lawn and Kinney, 2014).

To identify public health and policy interventions to improve maternal and infant health, our research focuses on why preterm birth rates are high in the United States. In order to arrive at potential solutions to the high preterm birth rates in the U.S., we analyzed and discussed contributing factors such as maternal age, income, social support, insurance status, pre-existing health, environment, education, and drug use.

Introduction: The Scope of the Problem

According to the Center for Disease Control, approximately 1 in 10 babies born in the U.S. are born prematurely (CDC, 2019). The rate of preterm births increased from 2014 to 2016 overall for the U.S., including significant increase in 23 states and the District of Columbia (Martin and Osterman, 2018). The U.S. ranks among the top ten countries in the world for the number of preterm births, contributing to approximately 2.6% of all preterm births worldwide (Chawanpaiboon et al, 2014). While a global survey of preterm birth rates has not been conducted by the World Health Organization since 2010, the thorough examination of preterm births worldwide placed the United States preterm birth rate at a comparable point to that of Turkey, Somalia, and Lesotho. The preterm birth rate in the U.S. far exceeded that of many economically comparable nations including Sweden, Finland, Denmark, Norway, Japan, the United Kingdom and France, even to the point of being almost double the rates present in these comparable countries (WHO, 2011). Within the U.S., large regional discrepancies between preterm birth rates exist. Preterm birth rates are worst in Louisiana, Mississippi, Alabama, and West Virginia. Within these regions, large racial disparities exist. For example, in Louisiana a black woman is 51% more likely to have a preterm baby than all other women. In Minnesota, though preterm birth rates overall are much lower, racial disparities are still clearly evident as American Indian/Alaskan Native (AIAN) women are 58% more likely to have a preterm baby (National Center for Health Statistics, 2017).



Findings

Age:

- Mothers in the U.S. are getting older on average. Older mothers tend to have higher risks for preterm births because of physiological changes and fertility treatment use.
- Maternal age rising cannot explain discrepancy between the U.S. and other comparable nations as the average age of U.S. mothers tends to be lower than others. This is partially because the U.S. has more teen mothers, however, which also poses risks for preterm births.

Socioeconomic Status:

- Lower socioeconomic status has a wide range of consequences linked to preterm birth. These factors include stress, what one is exposed to in their neighborhood, lack of access to quality healthcare, and lack of access to high quality education.
- In the U.S. is the large gap in wealth accumulation and financial security between people of different racial backgrounds, potentially contributing to the large gap in birth outcomes (Williams, 2017).

Social Support:

- Interpersonal social support from family, friends, and acquaintances was crucial to the success of a woman's pregnancy. Women who were unmarried, had lower levels of education, had unintended pregnancies, or more children tended to have lower scores for interpersonal social support and worse birth outcomes
- On a macro-level, the general societal support for women's issues tends to correlate with birth outcomes. In the U.S. women do not have guaranteed paid time off, which disproportionately negatively affects single mothers who on average also have lower levels of social support. In addition, once women go back to work, they do not receive the same promotional opportunities as their male counterparts, leading to large pay gaps over time between women and men, once again affecting the stress level of single mothers specifically

Pre-existing Health:

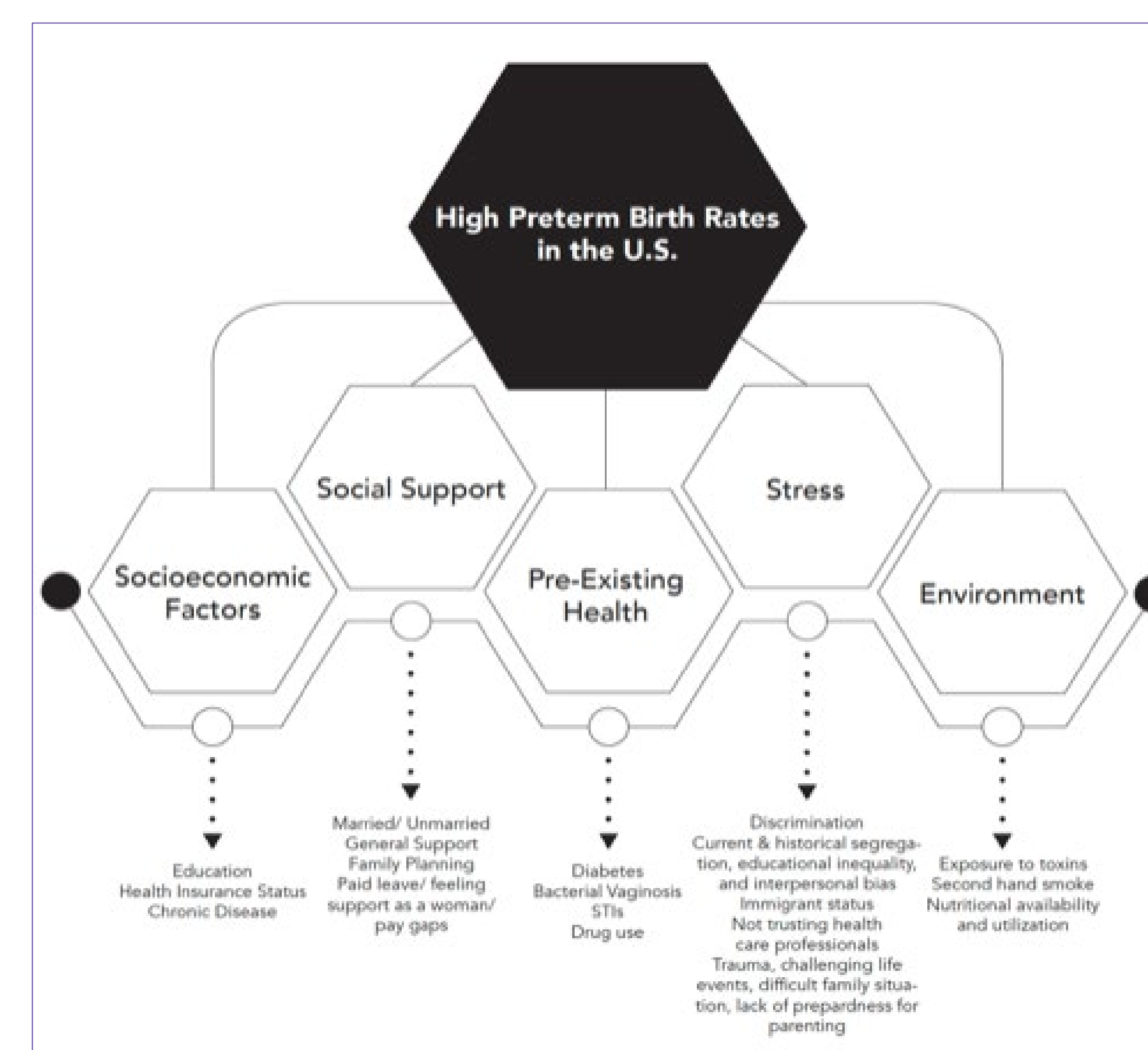
- Perceived stress, including stress related to the effects of discrimination over time, have been shown to increase preterm birth risk (Nansel et al., 2006). Discriminatory stress is not isolated to overt incidents, but rather is cumulative, impacting a woman's physiology and her likelihood to seek out preterm care as women of color are less likely to trust healthcare professionals (Halbert et al, 2006). Women also are more likely to have a high stress pregnancy if the pregnancy is unintended, which is more common in the United States than in comparable nations (Jansen et al, 2009).

Stress:

- Inflammatory bowel disease is related to preterm births (Brohms et al., 2016). Infections such as bacterial vaginosis and periodontitis, a type of gum disease, are linked to preterm births largely because they may be associated with pre-eclampsia (Kunnen et al., 2006). Bacterial vaginosis specifically is largely stratified in prevalence based on race, which is important to recognize when analyzing racial discrepancies in outcomes (Usher-Pines, 2009). Chronic hypertension and gestational diabetes are linked to preterm births (Madan et al, 2009). It is notable that the United States rates of diabetes and obesity are very high while compared to comparable nations, though obesity rates are tending to rise globally due to changes in lifestyle and food production (Sutton et al., 2010).
- STIs are a serious issue as one study with a random sample attributed 14% of preterm births to chlamydia alone (Rohrs et al, 2011). Substantial racial disparities in those affected with chlamydia exist, with prevalence among non-Hispanic blacks 5.6 times the prevalence in non-Hispanic whites (CDC, 2017).

Environment:

- If a woman is exposed to heavy air pollution, this increases her risk of preterm birth. Environmental factors are largely dependent on socioeconomic status, as lower income areas tend to have greater exposure to toxins (Lin et al., 2016). Similarly, low income areas tend to have higher crime rates and less access to healthy foods, leading to more stress and reduced health for mothers. Even if wealthier people are in food deserts, they typically have access to transportation that allows them to access supermarkets and buy healthier foods (Nash et al, 2013).



Interventions

Policy interventions must be multifaceted in order to address the problem of preterm births, both prenatal care interventions and even more preventative public health measures are necessary.

Prenatal Care Interventions:

- Involving midwives in particular in maternal and child health policy may improve outcomes as their expertise can lead to better ideas.
- Early visits within the first trimester of pregnancy for all women and thorough screening for STIs even among women who do not display symptoms, support offered throughout pregnancy that is convenient and available to the mother are crucial. In the U.S. though women tend to have more scheduled gynecological visits during pregnancy, the care tend to begin later, which is problematic as pregnancy interventions are best done early on.
- It is further necessary to work with practitioners to insure that there are resources to help women who are addicted to substances while pregnant and that these women feel confident in seeking help without criminalization because they will be far more likely to seek out medical care if they are not in danger of legal consequences.
- Medical professionals must caution against unnecessary C-sections and inducements.
- Additionally, strengthened efforts against all types of discrimination within preterm care, the birthing process, and after delivery could help to minimize disparities in birth outcomes and likelihood for women of color to seek out care and have lower stress rates.
- Prenatal care efforts could also be improved by the administration of stress evaluations and a more comprehensive understanding from practitioners as to how perceived stress by the mother can affect fetal development.

Other Public Health Interventions:

- In order to help women prepare for pregnancy, it is important to consider not only ways to help all women achieve health, but also to factor in ways to potentially decrease the amount of unplanned pregnancies and STIs. Possible interventions include streamlining sexual education throughout the United States and working to increase contraceptive availability and family planning services throughout all communities.
- In addition, reducing racial disparities in birth outcomes must be simultaneous to efforts in reducing general inequalities in housing, wealth accumulation, and well-being.
- Increasingly holistic medical care that does not merely provide medications for symptoms, but considers one's comprehensive health to determine a correct diagnosis, further relying on specialists to cooperate and pool knowledge together to determine best practices.

Future Research

- The racial discrepancies in birth outcomes in other comparable countries
- Further research on environmental justice and toxin exposure in other comparable countries also.
- Nutrition and birth outcomes: what exactly is the relationship? There is information about food deserts and the importance of nutrition to pregnancy in general, but few studies directly relating nutrition to preterm births.
- Data on the distribution of ages of mothers in various countries, not just the mean age, would be helpful.
- Direct research about preterm birth and contributing factors in the Minneapolis and St. Paul area.

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