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**Pregnant and hungry: addressing food insecurity in pregnant women during the COVID-19 pandemic in the United States**

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**Introduction**

Every 1 in 3 women seen for prenatal care this week could not afford to buy the food needed to support a healthy pregnancy. Food insecurity, a lack of consistent access to the nutritionally adequate and safe food needed for a healthy life, is a major public health problem in the United States. As an important social determinant of health, food insecurity is associated with poor health outcomes. However, it is often a neglected component of women’s healthcare. Most obstetrical providers do not routinely screen for food insecurity, and because of social stigma, most women do not voluntarily disclose their struggles to feed themselves and their families. Over the past year, the COVID-19 pandemic has only exacerbated the crisis of food insecurity, bringing this public health issue front and center to medical professionals caring for women of reproductive age.

Food insecurity is a major social determinant of health affecting more than 10% of Americans. Social determinants of health are increasingly recognized as a driving force of health inequities. It is well established that food insecurity leads to adverse health outcomes outside of pregnancy, such as obesity, hypertension, diabetes mellitus, and mental health problems. However, limited data exist about the impact of food insecurity during pregnancy on maternal and neonatal outcomes. Food insecurity and other social determinants of health are rarely addressed as part of routine obstetrical care. The COVID-19 pandemic has only exacerbated the crisis of food insecurity across the country, disproportionately affecting women and racial and ethnic minorities. Women’s health providers should implement universal screening for maternal food insecurity and offer resources to women struggling to feed themselves and their families. Reducing maternal health inequities in the United States involves recognizing and addressing food insecurity, along with other social determinants of health, and advocating for public policies that support and protect all women’s right to healthy food during pregnancy.

**Key words:** diet quality, food security, maternal nutrition, pregnancy outcomes, SARS-CoV-2, social determinants of health

Food insecurity in the United States

In 2019, 10.5% of US households experienced food insecurity, with 4.1% reporting very low food security. This translates into over 35 million Americans living in a food-insecure household. Of those 35 million Americans, 9 million live with very low food security, meaning they had disrupted eating patterns and reduced food intake because of a lack of money or resources for food (Box 1).

Women are disproportionately affected by food insecurity, with single mothers bearing the largest burden. In 2019, approximately one-third of single mothers surveyed reported food insecurity. This gender disparity is partially due to the fact that women are more likely to be poor, be employed in low-wage and part-time jobs, and take on unpaid labor, including caring for children, older family members, and housework. In addition, women are more likely to take on the role of feeding the family, which includes foregoing food themselves to prevent depriving their children of food.

There exists a racial disparity in food security in the United States, with significantly higher rates of racial and ethnic minorities suffering from food insecurity. Black non-Hispanic households are 2.4 times more likely to report food insecurity than White households, whereas Hispanic households are twice as likely to report food insecurity. Women are vulnerable to food insecurity no matter where they live, with urban cities and rural communities alike affected. Women in rural parts of the country often have less education, fewer employment opportunities, and lower wages, putting them at risk of food insecurity. Although food insecurity varies geographically across the United States with higher rates in the South (11.2%) and lower rates in the Northeast (9.6%), women with food insecurity can be found in every town and city in America. These sobering statistics conceal the fact that most obstetrical providers are caring for women with food insecurity every day regardless of their clinical practice location, further emphasizing the need for universal screening.
Food insecurity is a social determinant of health

Food security is a key social determinant of health. There is increasing recognition of the impact that these environmental and social exposures have on health outcomes and their contribution to health inequities. It is estimated that 50% to 60% of health status have on health outcomes and their environmental and social exposures cognition of the impact that these Health insecurity is a social determinant of health. In predominantly Black neighborhoods, the availability of supermarkets is only half that of White neighborhoods, whereas in predominantly Hispanic neighborhoods, it is even lower (32%). For many, the cost of transportation to obtain food can be prohibitive. Living in a food desert, an area with limited access to nutritious food, is associated with higher rates of food insecurity and pregnancy outcomes in adults. In pregnancy, living in a food desert is associated with pregnancy morbidity. Food swamps, areas saturated with convenience stores selling junk food and fast-food restaurants, overlie food deserts, creating the perfect storm. These areas, with a lack of access to healthy food choices and an abundance of access to cheap, unhealthy food, disproportionately predominate the landscape of low-income and minority communities. Without access to healthy food, individuals are more likely to consume inexpensive calorie-dense, highly processed foods with low nutrient value found in food swamps. Overall, this leads to a lower-quality diet and decreased nutrient intake. Adults with food insecurity consume fewer vegetables, fruits, and dairy compared with adults with food security. On a nutrient level, food insecurity has been shown to be associated with lower intake of calcium, magnesium, zinc, and vitamins A and B6 and higher intake of saturated fat. Studies looking specifically at women have found that diet quality is diminished in the setting of food insecurity. The impact of low-quality diet on pregnancy outcomes has yet to be fully elucidated.

Food insecurity and health risks

Food insecurity is associated with negative health outcomes in adults, including obesity, hypertension, diabetes mellitus, and mental health problems. In fact, food insecurity is more strongly associated with chronic disease than income. The underlying mechanisms linking food insecurity and chronic disease are hypothesized to include constrained food options and cyclic eating patterns leading to visceral adiposity and insulin resistance, severe stress contributing to dysregulation of the hypothalamic-pituitary-adrenal axis, metabolic disturbance, and inflammation. Food insecurity can be a barrier to treatment strategies that rely on specific diets or healthy food choices, such as the treatment of diabetes mellitus, hypertension, hyperlipidemia, and obesity.

Despite the fact that food insecurity is a major social determinant of health, there is a paucity of literature investigating the associations between maternal food insecurity and pregnancy outcomes. Moreover, existing studies are small and have conflicting findings (Table). In fact, a recent study found that food insecurity during pregnancy is associated with lower gestational weight gain. However, previous work has found higher rates of pre-pregnancy obesity and gestational weight gain in women with food insecurity. The association between food insecurity and gestational diabetes mellitus is unclear. Women with food insecurity have higher rates of iron deficiency during pregnancy (31% vs 22%), but this finding was driven by differences in iron supplementation. Notwithstanding the lack of pregnancy-specific literature, the link between food insecurity and chronic disease is well established. Many women enter pregnancy with comorbidities, including obesity, diabetes

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**BOX 1**

**Definition of food security**

| Food security                          | Marginal food security: 1 or 2 reported indications, typically of anxiety over food sufficiency or shortage of food in the house. Little or no indication of changes in diets or food intake. |
|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Low food security: reports of reduced quality, variety, or desirability of diet. Little or no indication of reduced food intake. |                                                                                                                                  |
| Very low food security: reports of multiple indications of disrupted eating patterns and reduced food intake. |                                                                                                                                  |

Adapted from the Economic Research Service, US Department of Agriculture.

Dolin. Food insecurity during pregnancy. Am J Obstet Gynecol MFM 2021.
Food insecurity affects the feeding choices of the newborn and infant, with potential implications for future obesity and disease risk. Women with food insecurity have reported concerns about breastmilk quality and supply because of poor diet and stress, leading them to supplement with or switch completely to formula. Pregnancy, and ideally preconception, is a time to address food concerns to promote a healthier mother-infant dyad throughout pregnancy and into the postpartum period.

**Food insecurity during the COVID-19 pandemic**

Since the beginning of 2020, the SARS-CoV-2 has spread throughout the United States and worldwide. This unprecedented pandemic has had a huge impact on unemployment, poverty, and access to healthy food with sweeping implications on food security in the United States.

During the spring of 2020, the COVID-19 pandemic more than doubled the prevalence of food insecurity from 10.5% to 23% of all US households. It is projected that the number of Americans with food insecurity increased by 17 million during 2020. In those households with children, the prevalence of food insecurity tripled to 30%. This significant increase in food insecurity has disproportionally affected people of color. In households with children, a staggering 41% of Black and 36% of Hispanic households reported food insecurity during the COVID-19 pandemic. With schools closed because of concern for transmission of COVID-19, many of the millions of low-income children who normally benefit from school feeding programs now need to be fed at home.

Although the government authorized measures to attempt to ensure continued delivery of food to children early in the pandemic, a decentralized and fragmented system at the state and local level left many children without access to healthy food. Studies have shown that when food resources are scarce, women prioritize feeding their children over feeding themselves.

Mitigation strategies against the spread of COVID-19, including social distancing, quarantine, and community lockdowns, led to limited access to healthy food, consumption of a low-calorie diet, increased body mass index, and increased the risk of adverse pregnancy outcomes, such as preeclampsia, fetal growth disturbance, preterm delivery, and stillbirth.
Food insecurity may increase a pregnant woman’s risk of contracting COVID-19. Long waits at now crowded food pantries increase the risk of exposure to COVID-19. Those with food insecurity are often forced to obtain their food in person, potentially exposing themselves to COVID-19, whereas those who enjoy food security and a higher income can remain at home and obtain healthy food through contactless delivery. Although the US Department of Agriculture is piloting a Supplement Nutrition Assistance Program (SNAP) online purchasing program, it is not yet available in all states and restricts online purchasing to only a few retailers, limiting healthy food choices. Women are currently not able to use the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) benefits for online purchases and must shop in person, creating additional opportunities for exposure to COVID-19.

A call to action
Food insecurity does not occur in isolation from other social determinants of health, including housing security, economic stability, neighborhood environment, literacy, discrimination, and racism. We, as healthcare providers, need to have a better understanding not only of food insecurity but also of how all social determinants of health contribute to disparities in maternal and child outcomes, so we can establish an equitable healthcare delivery system.

We advocate for the implementation of universal food insecurity screening of pregnant women. This recommendation is in line with the American College of Obstetricians and Gynecologist’s suggestion that women’s health providers screen patients for social determinants of health, including food insecurity. Screening should occur at least once during pregnancy and again during the postpartum period. A brief, validated, 2-item food insecurity screening tool, the Hunger Vital Sign, can be used (Box 2). This 2-item screen for food insecurity has 97% sensitivity, allowing providers to quickly identify almost all individuals at risk of food insecurity.

A universal approach should be taken because food insecurity is associated with social stigma and most individuals will not disclose food insecurity unless asked directly. That being said, patients appreciate it when providers screen for food insecurity. Screening can be completed through paper survey, touchscreen pads in the office, previsit electronic survey, or in-person interview. Many electronic medical records already have the ability to integrate the brief 2-item food insecurity screening tool into clinical practice. Some women may feel more comfortable answering questions privately through a self-administered survey rather than face to face. If screening questions are asked verbally, care should be taken to screen women privately and not in the presence of children or other support persons. Food insecurity can be a difficult topic for providers to discuss. When asking screening questions, providers may start with: “As part of caring for the whole person, we ask everyone questions about food availability.” If feasible, administration of the full 18-item (10-item if no children in the house) US Household Food Security Survey can be considered (Appendix). Although longer and requiring additional administrative effort to administer in the clinical setting, this survey allows for the assessment of the severity of food insecurity and addresses more in-depth aspects of food insecurity.

Women who screen positive for food insecurity should be offered referrals and connected to community-based resources. We recommend identifying an office social worker or other designated individual that can review the women’s specific needs and provide information about local resources, including food banks and pantries. Women who are eligible for SNAP and WIC should be enrolled, if not already. Furthermore, one-third of women covered by Medicaid and eligible for WIC do not receive benefits. Once food insecurity is identified, the International Classification of Diseases, Tenth Revision, Clinical Modification code Z59.4 (lack of adequate food and safe drinking water) can be applied. This allows information about food security to be collected systematically and tracked.

Individual education about the components of a healthy diet during pregnancy may promote a higher-quality diet, even within constrained food resources. Unfortunately, many obstetricians are not equipped with the tools...
to effectively counsel women regarding diet. Despite the role of diet in the primary prevention of the most common diseases, only an average of 4 to 6 hours is devoted to nutrition education during the entire 4-year medical school curriculum. Most obstetrics and gynecology residency programs contain little to no formal nutrition education. Registered dietitians are highly qualified to provide this counseling to women; however, these services are often not covered by insurance or readily available to all clinical practices. For women with Internet access, online nutrition education resources can be recommended (Box 3).

As women’s health providers and authorities on pregnancy, we should advocate for the expansion of SNAP and WIC benefits to address the crisis of food insecurity, especially during the COVID-19 pandemic. Currently, the WIC benefits only provide $2.25 per week per person for fruits and vegetables, foods that are the cornerstone of a healthy and nutritious diet during pregnancy and lactation. During the COVID-19 pandemic, some local WIC centers have implemented remote visits, but many have not. Pandemic or not, we must advocate to limit barriers to obtaining benefits, such as multiple in-person visits to the WIC office to secure benefits. However, this is just the beginning to address the underlying social constructs that contribute to food insecurity.

Access to healthy food is not a privilege but should be considered a basic human right. With this framework in mind, the problem of food insecurity in pregnancy can be addressed in terms of the need to respect, protect, and fulfill access to food as a human right. Respect a pregnant woman’s right to acquire food, protect her right to access food, and fulfill her right to food through social and economic policy. Progressing a public health agenda to ensure food security in pregnancy requires government accountability, public participation and transparency, addressing inequity in food access, and using health outcomes research to create meaningful policy. Food security in pregnant women should not be about charity but rather creating an environment that allows all women to have the ability to nourish themselves with healthy food during pregnancy. Ensuring food security for women means addressing the larger underlying problems within our society, including ensuring coverage and access to healthcare, promoting economic security, and investing in infrastructure.

Future research
Despite the large-scale crisis of food insecurity in the United States, limited data exist about its prevalence in pregnant women and its impact on maternal and child health outcomes. There is a need to study the extent that pregnant women experience food insecurity in the United States and specifically how the COVID-19 pandemic has exacerbated this major public health challenge. By understanding the scope of the problem, we can begin to foster innovative approaches to help women have consistent access to healthy food during pregnancy.

Conclusion
The problem of food insecurity during pregnancy has been neglected by women’s healthcare providers for far too long. The COVID-19 pandemic has brought this and other social determinants of health to the forefront. Reaching health equity for women in the United States begins with recognizing and addressing food insecurity, in addition to other social determinants that limit us as medical professionals from providing the best overall care to our patients. The increase in food insecurity for pregnant women during the COVID-19 pandemic has the potential to have long-standing downstream effects that will impact generations. We must take the time to fully understand the social constructs in which our patients live and the interplay of these factors on our ability to deliver effective and equitable healthcare. These are some of the first steps in the much-needed ongoing work to end health inequities in our communities. Our advocacy needs to be far reaching from the individual patient level to our healthcare systems and community resources and requires initiatives to improve public policy that protects individual’s rights to basic needs, such as healthy food.

Supplementary materials
Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.ajogmf.2021.100378.

Appendix
Questions used in the U.S. Household Food Security Survey Module

1. “We worried whether our food would run out before we got money to buy more.” Was that often, sometimes, or never true for you in the last 12 months?
2. “The food that we bought just did not last and we did not have money to get more.” Was that often, sometimes, or never true for you in the last 12 months?
3. “We couldn’t afford to eat balanced meals.” Was that often, sometimes, or never true for you in the last 12 months?
4. In the last 12 months, did you or other adults in the household ever cut the size of your meals or skip meals because there wasn’t enough money for food? (Yes/No)
5. (If yes to question 4) How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months?
6. In the last 12 months, did you ever eat less than you felt you should because there wasn’t enough money for food? (Yes/No)
7. In the last 12 months, were you ever hungry, but did not eat, because there wasn’t enough money for food? (Yes/No)
8. In the last 12 months, did you lose weight because there wasn’t enough money for food? (Yes/No)
9. In the last 12 months did you or other adults in your household ever not eat for a whole day because there wasn’t enough money for food? (Yes/No)
10. (If yes to question 9) How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months?
(Questions 11-18 were asked only if the household included children age 0-17)

11. “We relied on only a few kinds of low-cost food to feed our children because we were running out of money to buy food.” Was that often, sometimes, or never true for you in the last 12 months?
12. “We couldn’t feed our children a balanced meal, because we couldn’t afford that.” Was that often, sometimes, or never true for you in the last 12 months?
13. “The children were not eating enough because we just couldn’t afford enough food.” Was that often, sometimes, or never true for you in the last 12 months?
14. In the last 12 months, did you ever cut the size of any of the children’s meals because there wasn’t enough money for food? (Yes/No)
15. In the last 12 months, were the children ever hungry but you just couldn’t afford more food? (Yes/No)
16. In the last 12 months, did any of the children ever skip a meal because there wasn’t enough money for food? (Yes/No)
17. (If yes to question 16) How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months?
18. In the last 12 months did any of the children ever not eat for a whole day because there wasn’t enough money for food? (Yes/No)

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