MCSP Nutrition Brief

Addressing Barriers to Maternal Nutrition: Evidence and Program Considerations

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Background

Adequate maternal nutrition during the "first 1,000 days" window is especially critical from conception through the first 6 months of life to improve nutritional status of both the woman and infant and reduce the risk of adverse birth outcomes, such as low birthweight and pre-term birth (Black et al. 2008; Haddad et al. 2015; Shrimpton 2012; Black et al. 2013; Barker et al. 2010; Ramakrishnan et al. 2012; Özaltin et al. 2010; USAID 2015). Data from 62 studies in low- and middle-income countries (LMICs) in Africa, Asia, and Latin America and the Caribbean found inadequate micronutrient intakes and very little dietary diversity among pregnant and lactating women (Lee et al. 2013). Unfortunately, many programs targeting the first 1,000 days have only focused implementation and evaluation efforts on infant and child health benefits and outcomes of nutrition interventions, not maternal dietary consumption during pregnancy and lactation (Lee et al. 2013; Victora et al. 2012).

This has left a gap in the understanding of the current situation of maternal nutrition and evidence-base to inform next steps in interventions.

According to the recent WHO guidelines, counseling about healthy eating and keeping physically active during pregnancy is recommended for pregnant women to stay healthy and to prevent excessive weight gain during pregnancy (WHO 2016).

Adequate maternal diet can be described as "a healthy diet which contains adequate energy, protein, vitamins and minerals, obtained through the consumption of a variety of foods, including green and orange vegetables, meat, fish, beans, nuts, whole grains and fruit."

Exclusive breastfeeding under 6 months of age is defined as the proportion of children, 0-5 months of age, fed only breast milk, with the exception of oral rehydration solution, vitamins, minerals, and/or medicines (WHO 2008).

Most normal gestational weight gain occurs following 20 weeks of gestation, and the definition of "normal" can be subject to regional variations and should consider pre-pregnant body mass index (BMI). According to the Institute of Medicine, women who are underweight at the start of pregnancy (BMI<18.5 kg/m2) should gain 12.5-18 kg, women who are normal weight at the start of pregnancy (BMI 18.5–24.9 kg/m2) should aim to gain 11.5–16 kg, overweight women (BMI 25–29.9 kg/m2) should aim to gain 7–11.5 kg, and obese women (BMI>30 kg/m2) should aim to gain 5–9 kg.

USAID's flagship Maternal and Child Survival Program (MCSP) conducted a literature review on barriers to maternal food consumption during pregnancy and lactation. This brief presents key findings and identifies barriers to maternal nutrition, according to evidence from 25 LMICs. These findings provide program managers and policymakers with a summary of the evidence and key considerations for inclusion of maternal nutrition and weight gain during pregnancy into program design and implementation.

Scope of the Problem

Key findings from literature review on barriers to maternal diet

Are there barriers to achieving adequate dietary intake during pregnancy and lactation?

Many barriers exist that impede adequate dietary intake in pregnant and lactating women. Food intake during pregnancy and lactation was largely driven by personal preferences and cravings, food avoidance due to cultural beliefs or food taboos (i.e., prohibition against consuming certain foods), perceived appropriateness of foods for pregnancy or lactation/postpartum, and economic constraints and beliefs surrounding pregnancy physiology (see Table 1).

Even when knowledge of healthy foods to consume during pregnancy and postpartum exists, increasing the quantity and quality of food during pregnancy is challenging for most mothers.

- **Knowledge and beliefs of optimal diet during pregnancy and lactation:** Studies (N=16) indicate that some women have knowledge of which foods are "healthy" for consumption during pregnancy and lactation. A few studies reported views that pregnant women have an understanding of the need for greater food consumption during certain life stages, relaying that women "should eat more" or "need extra food" during pregnancy or lactation (Girard et al. 2012; Hartini et al. 2005; Levay et al. 2013; Saldanha et al. 2012).

- **Foods considered healthy and/or appropriate during pregnancy:** The appropriateness of certain foods for consumption during various life stages, including pregnancy or lactation was described in 16 studies. In Egypt, Ethiopia, India, Kenya, and Tanzania, study participants mentioned the importance of a higher recommended intake of "vitamins," "good," and "beneficial" foods and quality of diet (i.e., consuming vegetables, fruits, meat, and fish) during pregnancy (de Sa et al. 2013; Levay et al. 2013; Kavle et al. 2015; Saldanha et al. 2012; Young and Pike 2012). In Burkina Faso and Nigeria, the quality of diet during pregnancy was connected to small birth size (Girard et al. 2012; Huybregts et al. 2009).

- **Foods considered healthy and/or appropriate during lactation/postpartum:** Few studies reported on appropriate foods for consumption during breastfeeding. A study in Egypt found that breastfeeding mothers often received conflicting information from health workers and others on vegetables and sugary foods (Kavle et al. 2015). Women in Bangladesh were told to eat dry food after delivery cooked without water, rice with mashed potato, and black cumin seed because these foods were believed to keep the stomach "cool" and initiate the production of breast milk (Choudhury et al. 2012). In Tanzania and Kenya, appropriate foods, such as broth, are considered to "provide strength" to lactating mothers (Young and Pike 2012).

- **Food appropriateness according to a humoral belief system:** Food appropriateness is dictated by a humoral belief system in several Asian countries, where hot and cold states define the suitability of food for consumption during pregnancy and lactation. A humoral belief system, which categorizes pregnancy as a "hot" state that can harm a fetus, supports the avoidance of hot and spicy foods (e.g., beef and anchovies). "Cool" foods (e.g., coconut milk), which alter the hot state of pregnancy, are instead recommended for consumption (Choudhury and Ahmed 2011; Christian et al. 2006; Hishamshah et al. 2010; Holmes et al. 2007; Lakshmi 2013; Lundberg and Ngoc Thu 2012; Mukhopadhyay and Sarkar 2009; Raven et al. 2007; Sein 2013).

- **Food avoidance:** Foods considered inappropriate for consumption during pregnancy or lactation, such as spicy, bad-smelling, and nausea-inducing foods, often led to elimination of these foods from the diet in countries like Burkina Faso, India, Indonesia, Nepal, Laos, and Senegal. Foods of high nutrient value were avoided during pregnancy, based on a wide range of cultural taboos and misinformation (Hartini et al. 2005; Holmes et al. 2007; Huybregts et al. 2009; Lakshmi 2013). For example, in Indonesia, 14 kinds of vegetables, 10 kinds of fish, 5 meat/animal-source foods, and 14 fruits were eliminated from the diet because most believed these foods led to negative health effects for the mother and fetus (Hartini et al. 2005). Food avoidance can also stem from beliefs of ill effects during labor and delivery caused by

consumption of certain foods, such as duck, beef, and fish, believed to cause a big baby and a difficult labor (Choudhury and Ahmed 2011).

- **Food preference and cravings:** Personal preference and cravings influenced food choice during pregnancy and postpartum. In Bangladesh, women described cravings for sweet and spicy foods during pregnancy, such as a molasses drink, rice with green chilies, and milk, which resulted in a diet restricted to these specified foods (Choudhury and Ahmed 2011). In Nepal, women craved very spicy and sour foods, such as pickles, but also believed these foods "caused pain to the baby and hurt its stomach," so these foods were not consumed often (Christian et al. 2006).

- **Other perceptions in relation to maternal diet:** Another barrier was the lack of understanding of the physiological state of pregnancy and the fetal development process in relation to maternal diet. Girard et al. (2012) revealed that mothers, community leaders, or health promoters related poor nutrition during pregnancy to low birthweight or intrauterine growth restriction because they attributed the child's health to "divine will." Similarly, in Ethiopia, study results reported that women "think that the health of the baby is determined by God" (Saldanha et al. 2012). A few studies cited beliefs that the fetus and food were both located in the stomach, and therefore, if women ate too much food, the baby would not have room to grow (Christian et al. 2006; Huybregts et al. 2009).

- **Reduction in food consumption during pregnancy:** Women also relayed deliberately eating less food during pregnancy due to fear of having a large baby and enduring a difficult labor. The practice of intentionally eating less or "eating down" during pregnancy for fear of delivering a large baby and enduring long, painful labor was cited in several countries, including Senegal, Nepal, Laos, India, Japan, Pakistan, Indonesia, and Burkina Faso (Christian et al. 2006; Hartini et al. 2005; Holmes et al. 2007; Khadduri et al. 2008; Oni and Tukur 2012; Saldanha et al. 2012; Takimoto, Mitsuishi, and Kato 2011; Huybregts et al. 2009).

- **Variable food consumption during lactation:** Food consumption patterns for lactating mothers varied considerably, from reducing food intake to eating larger amounts of food. In Bangladesh, Nepal, and Pakistan, women observed a confinement period after pregnancy, which was cited as a time to restore strength and balance (Choudhury et al. 2012; Christian et al. 2006; Khadduri et al. 2008). During this time women generally ate small amounts of food with little to no nutritional value, consisting mainly of rice and salt or a traditionally prepared dish of broth (Choudhury et al. 2012; Christian et al. 2006; Hartini et al. 2005; Khadduri et al. 2008).

- **Economic constraints:** Economic constraints are a major barrier to obtaining food in Bangladesh, Indonesia, Burkina Faso, Egypt, Ethiopia, India, Kenya, Nepal, Nigeria, Pakistan, and Tanzania. Poor economic conditions were primarily defined as the inability to purchase more nutritious foods for the household, such as dairy products (e.g., milk), fish, chicken, eggs, and red meat. Women from Tanzania reported strong aversions to maize, yet economic conditions forced women to consume maize because it was a less expensive alternative to craved foods, such as meats (Young and Pike 2012).

- **Intra-household food allocation:** In many countries, husbands and children eat prior to women in the household due to cultural norms; therefore, women often do not receive additional food (Girard et al. 2012; Hartini et al. 2005; Levay et al. 2013; Saldanha et al. 2012). In Indonesia, Ethiopia, and Nigeria, if a woman was hungry and desired to increase her food consumption, she was unlikely to acknowledge this because of family norms and the needs of children and husbands, which took precedence over her own needs (Girard et al. 2012; Hartini et al. 2005; Saldanha et al. 2012).

How do mothers receive information about diet during pregnancy and lactation?

Family members (primarily mothers/mothers-in-law) or friends often provide advice on recommended foods for consumption during pregnancy. Most mothers followed advice from these trusted sources of information, as advice was often a consequence of traditions passed from generations (i.e., "eat less food than usual so one does not become ill"). Mothers often reported adhering to the advice given out of respect for these trusted sources (Choudhury and Ahmed 2011; Hartini et al. 2005; Khadduri et al. 2008; Perumal et al. 2013).

Country Actions

At the country level, have countries taken action to both recognize and address barriers to adequate nutrition during pregnancy and lactation?

An analysis of 25 LMIC policies, strategies, and guidelines was conducted (see Table 2 for Ending Preventable Child and Maternal Deaths1 and Feed the Future2 countries). Although all countries addressed the need to improve nutrition during pregnancy and/or lactation (i.e., quantity of food, dietary diversity), only six countries addressed weight gain during pregnancy.

Table 2. Low- and middle-income countries with policies, strategies, and guidelines that address maternal diet during pregnancy and lactation (denoted by "x")

Countries	Maternal Diet	Weight Gain During Pregnancy	Address in Antenatal/ Postnatal Care Counseling	Information, Education, and Communication	Address in Community-Level Programs
Afghanistan*	X			X	X
Bangladesh*±	X	X			
Burma	X			X	X
Chad	X			X	X
DRC*	X		X		
Ethiopia*±	X	X	X	X	
Ghana*±	X	X	X		X
Guinea	X		X		
Haiti*±	X		X	X	X
India*	X		X		
Indonesia*	X				X
Kenya*±	X	X	X	X	X
Lao PDR	X			X	
Liberia*±	X				
Mali*±	X				
Mozambique*±	X	X		X	
Nepal*±	X			X	X
Niger	X			X	
Nigeria*	X			X	X
Sierra Leone	X		X		X
Uganda*±	X		X		
Yemen*	X			X	
Zimbabwe	X	X		X	

*Ending Preventable Child and Maternal Death country.
±Feed the Future country.

[1] USAID Maternal and Child Health programs focus on 25 countries that represent more than 70% of maternal and child deaths. The 25 priority countries were chosen based on the magnitude and severity of maternal and child deaths, country commitment, USAID Mission capacity, and potential opportunity to integrate programs and leverage investments.
[2] Feed the Future, the U.S. Government's global hunger and food security initiative, supports approaches to address the root causes of hunger and poverty through transformation of countries' agricultural sectors to grow enough food to sustainably feed their people.

Despite a widespread lack of comprehensive programming and policies across LMICs addressing maternal diet, there are some notable exceptions:

- **Haiti:** The 2013–2018 Strategic Plan for Nutrition acknowledges that there is a high prevalence of malnutrition among women who are of reproductive age, pregnant, or lactating. The plan calls for strengthening promotion of proper nutrition for pregnant and lactating women in health facilities, nutrition education and hygiene, and consumption of nutrient-rich foods to mothers and young children.
- **Kenya:** The 2012–2017 National Nutrition Action Plan acknowledges that malnutrition among pregnant and lactating women needs to be addressed, with improvement of nutritional status of women of reproductive age as a strategic objective. For pregnant and lactating women, priority areas include promoting healthy dietary practices, routine weight monitoring and appropriate counseling, management of maternal malnutrition, and strengthening the capacity of health facilities to offer maternal nutrition services.
- **Nigeria:** The National Strategic Plan of Action for Nutrition 2014–2019 enhances care for vulnerable groups, explicitly including pregnant and lactating women. Actions of this plan are community-based and include promoting nutrition education and training of caregivers, including men, at household and community levels; educating and training girls and women as caregivers at the household level; and promoting provision of adequate nutrition care by community-based support groups, including women in agriculture.
- **Sierra Leone:** The 2012–2016 Sierra Leone National Food and Nutrition Security Policy mentions the aim to "promote appropriate feeding practices for the family especially pregnant and lactating women at facility and community levels" through counseling via antenatal, postnatal, and outreach services.

Programmatic Considerations

How can maternal health and nutrition programs address barriers to adequate nutrition during pregnancy and lactation?

Good maternal nutrition and appropriate weight gain during pregnancy are critical to prevent all forms of malnutrition during the first two years of life and achieve the wider goal of protecting health and economic outcomes in adult women and their own children. Improving the nutrition of pregnant and lactating women through programming is an important component of USAID's Multi-Sectoral Nutrition Strategy 2014–2025 and reaching Ending Preventable Child and Maternal Development goals. The Strategy discusses the importance of reducing malnutrition among women of reproductive age (ages 15–49) and children under 5, with a special focus on the 1,000-day window from pregnancy to a child's second birthday. The Strategy sets forth a comprehensive approach for maternal nutrition-specific and nutrition-sensitive interventions that can be integrated into programs across health platforms (USAID 2014). A few programs have incorporated weight monitoring during pregnancy and/or nutritional educational counseling alongside prevention of anemia, micronutrient supplementation, hygiene, and/or health (Rivera et al. 2004; Pandav 2006; Miller, Tsoka, and Reichert 2008).

Illustrative key interventions to address maternal diet and weight gain during pregnancy

- **National level**
  - Include guidelines on maternal diet and weight gain during pregnancy in key policy and strategic documents, including maternal health documents.
  - Include maternal diet and weight gain during pregnancy into pre-service and in-service training and curricula.
  - Engage with other sectors, including Ministries of Youth, Gender, Education, and Agriculture (USAID 2015; Duffy et al. 2015).
- **Health facility level**
  - Antenatal care (ANC) and postnatal care (PNC) routine health contacts are missed opportunities to provide information and counseling on maternal diet and weight gain during pregnancy. Although

some countries include information, education, and communication on maternal diet during ANC and/or PNC in guidance or policy documents, materials at the facility level to support counseling are often lacking. Development of culturally-tailored, simple counseling materials and/or messages delivered during routine visits is critical.

- Train health providers, such as nurses, local nutritionists, and midwives, in counseling on what foods to consume and why, based on necessary energy, protein, micronutrients, and fatty acids, including fortified staple foods and condiments according to local cultural context (USAID 2015).
- Address beliefs that health providers may hold regarding maternal dietary intake and weight gain during pregnancy through trainings and onsite mentoring to provide local, culturally-appropriate solutions to improve quality of counseling and service delivery.

- **Community level**
  - Engage and empower grandmothers, fathers, and other key influencers (i.e., elder women, community leaders) to provide correct information on maternal diet and weight gain during pregnancy through cooking demonstrations as well as encourage early and frequent ANC visits (Gryboski 1996; Kayongo-Male and Onyango 1984; Wiley 2002).
  - Use mother-to-mother support groups, care groups, or community support groups as potential platforms to counsel on what foods to consume and why and to discuss challenges faced by women and potential solutions.
  - Address maternal nutrition within the context of infant and young child feeding counseling provided at the community level through platforms such as the Baby-Friendly Initiative (Kenya Ministry of Health, USAID MCSP, and UNICEF 2016).
- **Individual level**
  - Gain an understanding of cultural beliefs and barriers that influence food choice and perceptions about weight gain during pregnancy through formative research or assessments.
  - Use formative findings to design and implement culturally-appropriate approaches and messages to improve maternal diet and appropriate weight gain during pregnancy in order to prevent excessive weight gain during pregnancy.
  - Counsel on healthy eating and keeping physically active during pregnancy to promote a healthy pregnancy and to prevent excessive weight gain during pregnancy in contexts where overweight and obesity are emerging issues (WHO 2016).
  - Counsel on weight gain during pregnancy, according to pre-pregnancy BMI (WHO 2016).
- **Data gaps**
  - More information is needed on the impact of programs that include maternal nutrition interventions.
  - Indicators for maternal nutritional status, women's dietary diversity, monitoring weight gain during pregnancy, and birthweight should be included (FANTA 2016; WHO 2016).

Conclusion

Targeting approaches to address maternal nutrition and appropriate weight gain during pregnancy is critical to improve maternal and infant nutritional status and health outcomes. Improving diet pre-conception for adolescent girls is a crucial component of achieving optimal nutritional status during pregnancy and lactation through the identification and use of platforms to reach adolescents (i.e., schools, teen clubs) (Duffy et al. 2015). In addition, although most programs are targeted at infants and young children, a shift is needed to also address the health and nutrition of women pre-conception and during pregnancy and lactation in the design of future programs (Victora et al. 2012).

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