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Survival Program



Maternal Nutrition Operational Guidance

Program Considerations for Low- and Middle-Income
Countries

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Abbreviations

ANC	Antenatal Care
BF	Breastfeedin
BFCI	Baby Friendly Community Initiative
BMI	Body Mass Index
CBA	Cost-Benefit Analysis
CHV	Community Health Volunteer
DHS	Demographic and Health Surveys
EBF	Exclusive Breastfeeding
iCCM	Integrated Community Case Management
IPTp	Intermittent Preventative Treatment in Pregnancy
IYCF	Infant and Young Child Feeding
KAPC	Knowledge, Attitudes, Practices, and Coverage
LAM	Lactational Amenorrhea Method
LBW	Low Birthweight
LMIC	Low- and Middle-Income Countries
M2MSG	Mother-to-Mother Support Group
MCSP	Maternal and Child Survival Program
MDD-W	Minimum Dietary Diversity for Women
MICS	Multiple Indicator Cluster Survey
MIYCN	Maternal, Infant, and Young Child Nutrition
MOH	Ministry of Health
MUAC	Mid Upper Arm Circumference
PNC	Postnatal Care
PPFP	Postpartum Family Planning
SBCC	Social Behavior Change Communication
TIPs	Trials of Improved Practices
WHO	World Health Organization

Checklist: Step-By-Step Guidance on How to Add/Adapt Maternal Nutrition Interventions

Directions: Use this checklist as you work through this maternal nutrition guidance. Use it to determine next steps for program design and implementation. You can use a separate notebook or Microsoft Word file/Excel sheet to track what data/information currently exists, information needed, as well as your objectives, funding, and timeline.

Maternal Nutrition Program Guidance



STEP 1

Determine available information & data on maternal nutrition

Determine:

- What mothers, family members, health providers know about maternal diet (including collating survey data/qualitative reports on knowledge/beliefs)
- If information is available on content & quality of messages/counseling carried out in facility and community-based programming
- If data is available on dietary intake and diversity during pregnancy and lactation
- What data is available on anemia prevalence and causes
- What are the data needs in implementation areas or areas of highest need



STEP 2

Identify priorities, action items & plan for implementation

- Review existing programming, country guidance and government strategies to determine gaps at facility and/or community level (compared to global guidance)
- Align implementation plan & interventions with government strategies, priorities, existing data and program experience to date
- Identify potential collaborators and/or partners (government, NGO, civil society)
- Identify, discuss, assign and agree upon roles and responsibilities with gov't & implementing partners
- Identify objectives and timeframe for implementation
- Determine funds, staff and materials needed for implementation
- Follow-up/accountability and action

Maternal Nutrition Program Guidance



STEP 3

Collect data needed to design/adapt interventions or analyze existing data. Use this data to inform on program design

- Following steps 1 & 2, assess data needs, according to current and missing data
- If no quantitative data exists, collect data on dietary intakes, food frequency; food availability and seasonal variability
- If no data exist at the health facility level, do a health facility assessment to ascertain level & quality of counseling, presence and use of social behavior change materials, job aids, and supplies
- If no qualitative data exists, collect data on norms, actors and/or actions, drivers of food choice, beliefs/knowledge/perceptions regarding maternal diet/weight gain during pregnancy



STEP 4

Develop/adapt interventions for implementation

- Review data from Step 3, to strengthen existing interventions or to develop/add new program interventions
- Based on data needs, incorporate aspects of Enabling Environment, Health Systems and Demand Generation and Use (see examples of counseling messages and content provided)
- Design programs with the consideration of maternal nutrition interventions (antenatal care, postnatal care/during lactation)

I. Background

Optimal maternal nutrition during the “first 1,000 days” window from pregnancy through the first six months of life is critically important to improve nutritional status and health outcomes for women and their infants and to reduce the risk of adverse birth outcomes, such as low birthweight and preterm birth (Black et al. 2008; Haddad, Cameron, and Barnett 2015; Shrimpton 2012; Black et al. 2013; USAID 2014; Barker et al. 2010; Ramakrishnan et al. 2012; Özaltın, Hill, and Subramanian 2010). Further, optimal dietary intake 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. Yet, 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). Moreover, many young girls enter adolescence thin, stunted and/or anemic and suffer from micronutrient deficiencies and/or infections and may enter pregnancy before attaining their full adult stature and weight (Thurnam 2013). While many programs targeting the first 1,000 days have focused implementation and evaluation efforts on infant and child health benefits and outcomes of nutrition interventions, maternal diet during pregnancy and lactation (Lee et al. 2013; Victora et al. 2012), weight gain during pregnancy and iron folic-acid and calcium supplementation have received less attention. The lack of program implementation experience and data regarding maternal nutrition interventions have left a gap in understanding “*how to*” integrate maternal nutrition interventions in the planning and designing of health programs and projects.

This document provides practical guidance on designing, implementing, and strengthening the delivery of maternal nutrition interventions during pregnancy and lactation within the health system. This document is for use by Ministries of Health (MOHs), nongovernmental organizations (NGOs), and other implementing partners who deliver maternal nutrition interventions at the facility and/or community level and desire to add and/or strengthen maternal nutrition programming within the health system.

This document is organized into various sections: I Background, II Key global guidance on maternal nutrition, III Evidence from MCSP review, IV Program considerations, V Step by Step design with experience from MCSP, VI Country experience with MCSP examples, VII Key resources & websites, VIII-XI Appendices 1-4, and XII References.

II. Key Global Guidance on Maternal Nutrition

Antenatal Care

The 2016 World Health Organization (WHO) Antenatal Care (ANC) Guidelines outlines evidence-based approaches to antenatal care (WHO 2016b; WHO, USAID, and Maternal and Child Survival Program 2018). Provision of timely high-impact evidence-based antenatal care best practices improves health outcomes for mothers and newborns. ANC is an important window for influence or intervention, because most pregnant women will seek ANC care at some point in their pregnancies. ANC is an opportune time to identify women with an unhealthy, suboptimal dietary pattern in early pregnancy (WHO 2016b) (i.e., intake of high fat, processed foods, or diets that primarily consist of carbohydrates). Given many women present to ANC late, early and frequent ANC attendance can be encouraged and coupled with interventions to mobilize women to attend ANC early in pregnancy, at the community level (i.e., community mobilization, demand generation).

2016 WHO ANC Guidelines on Nutrition Recommendations

1. Rationale and importance of maternal diet and weight gain during pregnancy:
 - A healthy pregnancy requires a diet that includes an appropriate intake of energy, protein, vitamins, and minerals to meet maternal and fetal needs. Yet for many pregnant women, dietary intake of vegetables, meat, dairy products, and fruit is often insufficient to meet these needs, particularly in LMICs, where multiple nutritional deficiencies often co-exist.
 - Obesity and overweight are also associated with poor health, pregnancy, and lactation outcomes. Women who are overweight or obese are less likely to initiate breastfeeding or exclusively breastfeed and more likely to breastfeed for shorter duration (Soltani and Fair 2016; Garcia et al. 2016; Anstey and Jevitt 2011; Bever Babendure et al. 2015; Amir and Donath 2007). Many women in a variety of settings gain excessive weight during pregnancy. Therefore, pregnancy weight gain goals should be based on a woman's body mass index (BMI) at the start of her pregnancy.
2. Daily oral iron and folic acid (IFA supplements) with 30 to 60 mg of elemental iron and 400 µg (0.4 mg) of folic acid:
 - In settings with high prevalence of anemia in pregnant women (> 40% pregnant women have blood Hb concentration < 110 g/L), daily dose of 60 mg of elemental iron preferred over lower dose.
 - Anemia treatment: 120 mg elemental iron and 0.4 mg folic acid daily until Hb increases to 110 g/L or higher.
 - In community settings with poor access to health care professionals, consider task shifting¹ to reach the most vulnerable populations and ensure timely, continuous timely, and consistent treatment of patients.
3. Daily calcium supplementation (1.5–2.0 g oral elemental calcium) is recommended for pregnant women to reduce the risk of pre-eclampsia in populations with low dietary calcium intake:
 - Dietary counseling of pregnant women can promote adequate calcium intake through consumption of locally available, calcium-rich foods.
 - Dividing the dose of calcium may improve acceptability. Women are suggested to receive calcium supplementation of 1.5–2 grams daily. These doses can be divided into three doses, preferably taken at mealtimes.

¹ According to WHO, task-shifting is the redistribution of tasks among health workers (WHO 2008)

- Negative interactions between iron and calcium supplements may occur, meaning that calcium can inhibit iron absorption. Therefore, the two nutrients (i.e., supplements) should be taken several hours apart, rather than at the same time.
4. Provide counseling about healthy eating and keeping physically active to stay healthy and prevent excessive weight gain during pregnancy:
 - Discuss locally held beliefs, attitudes, and perceptions on physical activity and foods considered healthy or appropriate for consumption during pregnancy.
 - Provide recommendations on culturally appropriate healthy eating interventions, based on the local context (i.e., ANC nutritional counseling).
 - Effective communication with pregnant women about healthy eating (including food sources of vitamins, minerals, and dietary diversity) is integral to preventing anemia.
 - Consider task shifting for nutrition counseling.
 5. In undernourished² populations:
 - **Nutrition education on increasing daily energy and protein intake** is recommended for pregnant women to reduce the risk of low birthweight neonates.
 - **Balanced energy and protein dietary supplementation** are recommended for pregnant women to reduce the risk of stillbirths and small-for-gestational-age neonates.
 - While mid upper arm circumference (MUAC) can identify protein-energy malnutrition in some country contexts, countries and programs should conduct a cost-benefit analysis (CBA) before implementing a specific MUAC cutoff (Tang 2016). The CBA calculates a *cost per impact achieved* measure, which countries and programs can use to examine the costs of screening and treating all pregnant women at risk of delivering a low birthweight (LBW) infant at various MUAC cutoffs versus the cost savings of preventing an LBW birth outcome.
 - Consider alternative delivery platforms (e.g., peer counselors, media reminders, etc.)
 6. Preventive measures: Anti-helminthic treatment:
 - In endemic areas, preventive anti-helminthic treatment is recommended for pregnant women after the first trimester as part of worm infection reduction programs.
 7. Health system interventions to improve ANC utilization and quality:
 - A minimum of eight ANC contacts are recommended to reduce perinatal mortality and improve women’s experience of care.
 - It is recommended that each pregnant woman carry her own case notes during pregnancy to improve continuity, quality of care, and her pregnancy experience.
 - Task shift the promotion of health and nutrition related behaviors for maternal and newborn health, including counseling on exclusive breastfeeding, to a broad range of cadres, including lay health workers, auxiliary nurses, nurses, midwives, and doctors, is recommended.
 - Task shift the distribution of recommended nutritional supplements and intermittent preventative treatment in pregnancy (IPTp) for malaria prevention to a broad range of cadres, including auxiliary nurses, nurses, midwives, and doctors, is recommended.

The content, contact schedule, and considerations for maternal nutrition within the recommended six ANC contacts are shown in Appendix 1, Table 4.

² Undernutrition is classified as: BMI <18.5 (defined as 20–39% underweight prevalence is “high”; > 40% underweight prevalence “very high”)

Postnatal Care

In addition to antenatal care, there are key interventions for maternal nutrition at childbirth and postnatal care (PNC), including support for breastfeeding, counseling on maternal diet for lactating women/postpartum, outlined in USAID’s [Maternal Nutrition for Girls and Women: Technical Guidance Brief](#) (USAID 2015) and in Table 1 below.

Table 1: Delivery and PNC Contacts: maternal nutrition-related interventions

Delivery and PNC contacts	Nutrition related interventions and considerations during childbirth (delivery) and PNC contacts
Delivery (Childbirth)	<ul style="list-style-type: none"> • Delayed cord clamping (DCC) from 1–3 minutes except in the case of emergencies such as asphyxia in newborns • Early breastfeeding (i.e., initiation within 1 hour after delivery; provision of colostrum; not giving pre-lacteal feeds; positioning; managing breastfeeding [BF] problems)
Postnatal Care (PNC)	<ul style="list-style-type: none"> • Weekly IFA supplements (60 mg of iron, 2,800 mcg folic acid); counseling on why and how to take IFA/MMN and how to manage side effects, if they occur • Support to exclusive breastfeeding (i.e., on-demand and day and night feeding; frequency and duration of feeding, managing breastfeeding problems) • Counseling & social behavior change communication (SBCC) about adequate diet during lactation and postpartum—which foods to consume and why to provide optimal energy, protein, essential fatty acids, and micronutrients, including available fortified staples and condiments (i.e., iodized salt); taboos that limit food intake

Source: Maternal Nutrition for Girls and Women: Technical Guidance Brief (updated 2015) (USAID 2015).

In addition, WHO quality standards for maternal newborn health (MNH) and child health – “*For Improving Quality of Maternal and Newborn Care in Health Facilities*” and “Standards for improving quality of care for children and young adolescents in health facilities” address the quality of care in health facilities via standards for breastfeeding during delivery and postnatal care, as summarized below.

Quality standards for MNH and childbirth in relation to breastfeeding

Rationale: Routine care of newborns immediately after birth facilitates adaptation of the newborn to the new environment, meets his or her immediate needs in the best possible way, and avoids preventable complications (see **Appendix 2** for Quality of Care Standards for MNH and Child Health in relation to breastfeeding) (WHO 2016a). Optimal breastfeeding practices reduce neonatal and child mortality and morbidity, including respiratory infection, diarrhea, and otitis media, and growing evidence indicates that breastfeeding may be protective against obesity and diabetes (Victora et al. 2016; Black et al. 2008). Breastfeeding has maternal benefits, contributing to birth spacing, and longer durations are associated with reductions in ovarian and breast cancer (Victora et al. 2016).

Immediately after birth, newborns are dried thoroughly and placed in skin-to-skin contact with the mother for at least 1 hour. Clamping of the umbilical cord is delayed until 1–3 minutes after birth, and breastfeeding is supported in the first hour after birth. Any complications are identified and managed appropriately.

III. Evidence: Barriers to Optimal Maternal Nutrition

Many barriers exist that impede adequate dietary intake in pregnant and lactating women that can be addressed in health programming. An MCSP-led literature review found that 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 (Kavle and Landry 2017; Maternal and Child Survival Program 2017). A summary of key barriers to optimal maternal nutrition, based on the literature review findings and program experience are found in the MCSP [technical brief](#) and journal [publication](#) in **Appendix 3**.

IV. Considerations for Programs in How to Address Barriers to Maternal Nutrition

Improving the nutrition of pregnant and lactating women through programming is an important component of USAID’s Multi-Sectoral Nutrition Strategy 2014–2025. 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 considered for integration into programs across health platforms (USAID 2014). Illustrative key interventions to address maternal diet and weight gain during pregnancy through the health systems are summarized below (Maternal and Child Survival Program 2017). While issues regarding access to safe, quality and nutritious foods will not be addressed by solely intervening at the various levels described below, it is critical that engagement with other sectors (i.e., agriculture, water and sanitation, private sector, civil society), is part of the solution to ensure food systems are able to provide these types of foods for women to access and consume (FAO 2016, 2018).

- **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.
- **Health facility level**
 - Use ANC and PNC routine health contacts as 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 (that emphasize small doable actions) 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.
- 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. For example, engage grandmothers and fathers in cooking demonstrations, and encourage partner attendance at ANC.
 - 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 (Baby-Friendly Initiative)
- **Individual level**
 - Gain an understanding of cultural beliefs and barriers that influence food choice and perceptions about weight gain during pregnancy through formative research 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.
 - Counsel on weight gain during pregnancy, according to pre-pregnancy BMI.
- **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.

V. Step by Step: How to Design and Implement Maternal Nutrition Interventions

Step 1. Determine available information and data on maternal nutrition

Determine what mothers, fathers, family members, health providers, facility & community know about maternal nutrition

Qualitative formative research and assessments are an important step in designing and implementation maternal nutrition interventions within health programs. It provides an understanding of what mothers, members of the community, and health providers know about maternal nutrition, with regard to drivers of food choice, cultural beliefs/perceptions and related behaviors, as well as insight on which behaviors can be changed (Maternal and Child Survival Program 2019a). Research findings can help identify or fine tune interventions and in the selection of key monitoring and evaluation indicators. They are also useful in development of messages for advocacy, counseling, and ways to improve training, and supportive supervision. Formative research should take into account programs that are working on anemia, family planning, antenatal care, infant and young child feeding, HIV/AIDS prevention and treatment, environmental health, and agriculture and food systems, to find opportunities to integrate and/or strengthen maternal nutrition interventions. The roles and contributions of various programs/projects working could be discussed during technical working group meetings or other key fora to further advance collaboration and coordination of program activities.

MCSP Country Examples

In the **Democratic Republic of Congo (DRC), Egypt, Kenya Mozambique, and Tanzania**, counseling and other social and behavior change communication interventions with culturally-resonant messages were developed, based on formative research/assessments conducted with women and other key influencers, including elder women and fathers (see Appendix 3, Table 4). MCSP has conducted work to ensure the “what and why” of foods that provide the necessary energy, protein, micronutrients, and fatty acids, including fortified staple foods and condiments (Kavle and Landry 2017) are communicated within the context of cultural taboos and perceptions, in order to provide feasible solutions to increase dietary intake(USAID 2014).

The formative assessments/research in Egypt and Mozambique used the Trials of Improved Practices (TIPs) methodology (Maternal and Child Survival Program 2018). Consisting of three household visits with mothers, TIPs is a consultative methodology used to determine existing infant and young child feeding (IYCF) practices in the first visit and negotiate with the mothers new practices to try in the second visit. Mothers are followed up with one week later (the third visit) to determine if they were able to practice the counseled behaviors, what they thought of them, and if they would continue to practice them (Manoff Group 2015). The methodology identifies barriers, solutions to the barriers, and facilitating factors to practice optimal IYCF, which emanate from the mothers trying out the practices in their households—their real context.

MCSP also conducted formative implementation science research in the DRC (Kavle, Pacqué et al. 2019; Cooper et al. 2019) and Tanzania. In the DRC, MCSP examined cultural beliefs and perceptions of IYCF, child illness, and care-seeking behavior for sick children as well as perspectives of health providers who provide counseling on nutrition and integrated community case management (iCCM) to identify gaps and opportunities to strengthen nutrition counseling at the health facility and community level. In Tanzania, formative research was conducted to inform the development of a revitalized approach for promoting postpartum family planning (PPFP), optimal IYCF practices, lactational amenorrhea method (LAM) (among

other PFP options), and timely transition from LAM to another modern contraceptive method (Cooper et al. 2019).

Determine if information is available on content & quality of counseling carried out in facility and community-based programming

Despite the opportunity to counsel mothers on diet at routine health facility visits (ANC, PNC) and/or community level visits by community health workers (i.e., support groups or home visits), guidance on maternal nutrition is often lacking. An MCSP-led review showed guidance on maternal diet was not often given, and specific information on which foods, why, and how often they should be consumed were not provided during ANC. The review showed that messages/counseling consisted of “*eat well*” and “*take iron tablets or syrup*”, with reported “*vague and inconsistent education and counseling*”, such as “*eat more during pregnancy*”. Therefore, it is important to determine what counseling materials are available at the facility (i.e., ANC, PNC) and community level, and examine the content of these messages (USAID and Maternal and Child Survival Program 2019).

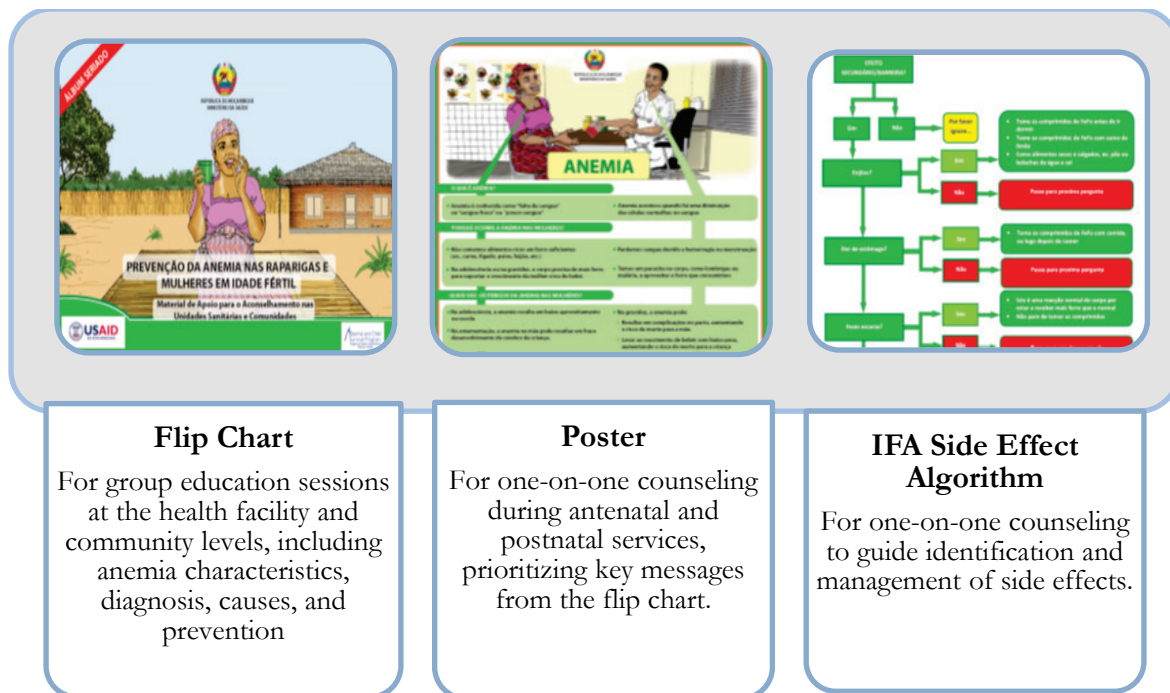
MCSP Country Example

In **Mozambique**, through a facility readiness assessment, MCSP identified gaps in anemia prevention and control, including limited counseling on anemia and IFA supplementation during antenatal care and lack of counseling materials, despite half of pregnant women affected by anemia (Maternal and Child Survival Program 2019). In addition, survey and formative data found:

1. Nationally, only 26% of women report consuming 90+ IFA supplements during their last pregnancy (DHS 2011), which was 10% in Nampula and 61% in Sofala.
2. MCSP Knowledge, Attitudes, Practices, and Coverage (KAPC) baseline survey results showed 90% of women reported receiving 90+ IFA supplements during their last pregnancy, yet only 8% in Nampula and 44% in Sofala reported consuming 90+ IFA supplements in Nampula.
3. A TIPs formative assessment found lack of knowledge of the purpose of taking IFA supplements, benefits, the side effects, and how to manage them.

MCSP presented this information to the Head of the Department of Nutrition at the MOH, and together they developed a suite of anemia counseling materials: flip chart, poster, and IFA side effect management algorithm, whose messages were based on formative research using TIPs (see **Appendix 4** for further details on the process for anemia material development and rollout).

Figure 1: Mozambique MOH and MCSP developed suite of anemia counseling materials



Flip Chart
For group education sessions at the health facility and community levels, including anemia characteristics, diagnosis, causes, and prevention

Poster
For one-on-one counseling during antenatal and postnatal services, prioritizing key messages from the flip chart.

IFA Side Effect Algorithm
For one-on-one counseling to guide identification and management of side effects.

Source: Development and Rollout of National Maternal Anemia Materials: Experience from Mozambique (Maternal and Child Survival Program 2019)

Determine what data is available on dietary intake during pregnancy and lactations

Examine available data on dietary intake during pregnancy and lactation. The Demographic and Health Surveys (DHS) and UNICEF’s Multiple Indicator Cluster Surveys ((UNICEF 2014; The Demographic and Health Surveys (DHS) Program 2019) are data sources that can be used to analyze breastfeeding trends, indicators (early initiation, exclusive breastfeeding) and other infant and young child feeding practices and are highly comparable data sources. UNICEF’s country breastfeeding score card, the Global Nutrition Report, and other key data sources—such as national or subnational surveys or research conducted by projects/partners and/or universities—can provide insight into dietary intake during pregnancy and lactation (UNICEF Breastfeeding Scorecard 2017; Global Nutrition Report n.d.).

Dietary diversity is important as many countries have diets that are based on starchy staples and micronutrient deficiencies are more likely (Ruel 2003). A common method of measuring dietary diversity for at individual level, is to collect information on the different food groups consumed during a specific period of time (quantity is not gathered), with higher scores representing greater diversity in the diet (International Dietary Data Expansion Project 2019). Indicators of women’s dietary diversity can be useful as measures of impact for programs designed to address nutrition through agricultural efforts/interventions, for example. The following are **examples of key indicators for maternal nutrition to track for monitoring and evaluation efforts:**

- **Minimum Dietary Diversity for Women (MDD-W)** are individual dietary diversity indices, specifically the considered a rough proxy (estimate) for diet quality and nutrient adequacy at a population level (FAO and FHI360 2016).
- **Average food consumption (in grams per person per day (FAO and WHO 2019) – in daily diet**
This indicator shows the average foods and food group consumption expressed in grams per person per day. The calculation considers all individuals in the population: consumers and non-consumers (i.e., it could be categorized as pregnant women, lactating women, or postpartum non-lactating women). Consumers are those individuals who did consume the food of interest during the survey period, and non-consumers are those who did not.

- **Average percentage contribution of different foods to the total consumption—in daily diet** (FAO and GIFT 2019)

This indicator shows the average percentage contribution of different foods and food groups to the total consumption in the population. The calculation takes into account all individuals in the population: those individuals who did consume the food of interest during the survey period, and those who did not.

- **Acute food consumption** (FAO and GIFT 2019): Percentage of consumers (i.e., pregnant or lactating women) and daily portions size among consumers on consumption days (in grams per person per day) — *This indicator shows the percentage of individuals in the population who consumed the food or food group of interest during the survey period (consumers), and the average daily foods and food group consumption expressed in grams per person per day among these individuals calculated based on the consumption days only. Consumption days are those days on which the food of interest was consumed.*

Determine what data is available on anemia prevalence and causes and IFA consumption

Examine if data on anemia is available, through survey or landscape analyses, which provide insight into the prevalence of anemia, IFA consumption, and/or the causes of anemia (i.e., iron deficiency, malaria, infections from micronutrient surveys). For example, DHS has the following survey data, which is collected every 3-5 years in most countries:

- Prevalence of anemia
 - Women with any anemia
 - Women with mild anemia
 - Women with moderate anemia
 - Women with severe anemia
- Micronutrient intake among mothers
 - Women with a birth in the past five years who received a vitamin A dose in the first two months after delivery
 - Women with a birth in the past five years who took no iron (folic acid) tablets or syrup
 - Women with a birth in the past five years who took iron tablets or syrup for <60 days
 - Women with a birth in the past five years who took iron tablets or syrup for 60-89 days
 - Women with a birth in the past five years who took iron tablets or syrup for 90+ days

If this data is not available, countries can consider advocating with government and key partners to include these indicators in population-based surveys, track trends, and use data to inform needed policy or intervention revisions. If this data is available, it can be used for tracking trend in anemia prevalence, severity of anemia, and consumption of iron folic acid supplements.

Determine data needs in areas of implementation or highest need

It is important to ascertain if data is available in designated areas of implementation or if selecting areas of the country, data with highest need (i.e., equity, socioeconomic factors, wealth quintile, rural vs. urban), as discussed with government (i.e., MOH and other line ministries, as needed), implementing partners and donors, as appropriate.

Step 2. Identify priorities and action items to inform on an implementation plan

Review existing programming & determine gaps (compared with global guidance) at facility and/or community level

It is important to review existing programs and compare with the global standards outlined in Section II. **Key global guidance on maternal nutrition**, as to what elements of programming are currently lacking or require strengthening.

Review and align implementation with government strategies, priorities, existing data, and program experience

Review all government documents, including latest strategic plans, nutrition action plans, health priorities, alongside a review of previously identified data, and ongoing programming to ensure that implementation builds upon experiences to date and addressing any existing gaps. It is also helpful to review DHS/Multiple Indicator Cluster Survey (MICS) data.

Identify potential collaborators and/or partners (government, NGO, civil society)

Examine and talk with all collaborators and partners, to discuss areas of alignment, and in terms of joint planning of interventions, phasing of approaches, and complementary, rather than duplicative, efforts. In addition, discuss how key messages, SBCC and interventions can be leveraged and harmonized so communities receive unified messages.

Identify, discuss, assign, and agree upon roles and responsibilities with gov't and partners

Hold a technical/stakeholders meeting to map out project areas, interventions, timelines, and staffing, and discuss how to coordinate and align efforts, roles, and responsibilities. Partners can prioritize activities, who is responsible and who will carry them out, and in which designated areas of the country. These decisions can be based on the maternal nutrition interventions to be carried out and a review of existing programming efforts at the facility and community levels.

Identify objectives and timeframe for implementation

Agree upon and share objectives for the implemented project/program, which could range from advocacy for maternal nutrition to improvement of existing maternal nutrition interventions or introduction of programming for maternal diet and/or maternal anemia. The objectives should have a designated timeframe, measurable deliverables/outputs, and including monitoring and evaluation, as well as quarterly updates of partners through technical working group meetings.

Determine funds, staff, and materials needed for implementation

If possible, share materials, and co-fund printing of materials, and discuss how staff can complement each other (i.e., joint community sensitization meetings, trainings, supportive supervision visits).

Agree to have follow-up meetings at agreed upon intervals, either through technical working group meetings or stakeholder meetings to assess progress.

Step 3. Collect data needed to design and adapt interventions or analyze existing data to inform on program design for maternal nutrition

Following step 1 and 2, assess any data needs, according to current and missing data

If no quantitative data exists on diet, collect data on dietary intakes, food frequency; food availability and/or seasonal variability, according to needs. Consider the use of established indicators to measure dietary diversity in the population, such as MDD-W.

If no data exist at the health facility level, do a health facility assessment to ascertain level & quality of counseling, presence and use of social behavior change materials, job aids, and supplies. In Mozambique, a health facility assessment was conducted to take stock of types and availability of SBCC nutrition materials, message content, and use of materials by health providers in 82 health facilities. Specifically, maternal anemia and maternal diet were topics explored. In addition, stocks of iron folic acid supplements were ascertained (i.e., if available, last stockout).

If no qualitative data exists, collect data on drivers of food choice, beliefs/knowledge/ perceptions regarding maternal diet/weight gain during pregnancy, especially dietary intake and diversity

Use qualitative approaches to conduct formative assessment/research:

1. **Trials of Improved Practices (TIPS) methodology**, which can promote behavior change and compliance to IFA, as well as address side effects. Consisting of three household visits with mothers, TIPS is a consultative methodology used to determine existing practices in the first visit and negotiate with mothers regarding new practices to try in the second visit. Mothers are followed up with one week later (the third visit) to determine if they were able to practice the counseled behaviors, what they thought of them, and if they would continue to practice them (Manoff Group 2015). The methodology identifies barriers, solutions to the barriers, and facilitating factors to practice optimal behaviors, which emanate from the mothers trying out the practices in their households—their real context.
2. **In-depth interviews or focus group discussions** with mothers, influential family members, and health workers at the facility and community level, can provide insight into cultural beliefs around maternal nutrition, depending on cultural and country context.

Step 4. Based on Step 3, develop/adapt interventions for implementation

Review data from Step 1 or Step 3 to strengthen existing interventions or in the development/addition of new interventions (Examples below)

There are several ways to add, develop or strengthen existing interventions, such as:

- **Advocate for inclusion of maternal nutrition** in country guidance/policy documents
- **Update training materials** on maternal diet and appropriate weight gain during pregnancy, based on qualitative data. In Mozambique, community-based management of acute malnutrition protocols, training materials, and job aids provide guidance on how to assess pregnant women’s nutrition status by monitoring weight gain in the second and third trimesters of pregnancy regardless of pre-pregnancy BMI.
- **Train providers** to improve counseling skills. Providers can be community or facility-based health providers, or other persons in the community (community leaders, civil society, agricultural extension workers) —who can aid in providing key messages.
- **Develop tools and materials to aid provider counseling** (e.g., job aids, key message booklets, flip charts,) and create messages based on qualitative formative assessment/research. These can also be used

in training. See Appendix 4 for a country example from Mozambique, for the development of maternal anemia counseling job aids.

- **Develop and/or adapt key counseling messages** to local context for strengthening services at health facility and/or community level.

Key messages for maternal nutrition: topics and country examples



Antenatal care (ANC) attendance and gestational weight gain monitoring

A minimum of eight ANC contacts is recommended to improve women's experience of care.

ANC provides an opportunity to monitor and counsel on maternal dietary intake and appropriate weight gain.

Bangladesh

- For the good health of the mother and unborn child, it is important to regularly monitor weight during pregnancy.
- Go for regular antenatal check-ups, monitor weight and get it registered in Mother-Child Protection Card. Weight gain shows the healthy growth of unborn baby.
- Weight should increase by 1.5 - 2 kgs per month from 4th month of pregnancy. A woman should gain 10-12 kgs of weight from pregnancy till birth of child.



Iron Folic Acid (IFA) and calcium supplementation

Pregnant women should consume daily oral IFA supplements with 30-60 mg elemental iron and 400 µg folic acid.

Mozambique

- IFA supplements do not make your baby too big, do not make it difficult to give birth, and do not cause high blood pressure.
- IFA tablets are for your own use only and should not be shared with others.
- They may cause some discomfort (e.g. nausea, stomach pain, constipation) and stool can become black - this is normal and disappears in a few days.



Maternal diet during pregnancy

Optimal maternal diet contains adequate energy, protein, vitamins and minerals, obtained through consumption of a variety of foods, including green and orange vegetables, meat, fish, beans, nuts, whole grains and fruit.

Bangladesh

- Consume 1-2 food items from each of the 5 recommended food groups with roti/rice daily
- Recommended food groups include: fish/meat & eggs, milk & dairy products, pulses & other grains, dark green leafy vegetables; orange/yellow fruits and vegetables.
- Increase the amount of food, energy and protein according to needs in each trimester of pregnancy



Maternal diet during lactation

Lactating mothers require additional energy intake to meet their nutritional needs and to support breast milk production.

The recommendations for a healthy diet during pregnancy also apply during lactation.

Egypt

- Drink more fluids to increase your milk production, such as fresh fruits and vegetables, juices, milk, and water
- Eat nutritious foods during breastfeeding (e.g., fruits, vegetables, meat)
- All mothers are able to produce enough milk for their babies; some mothers notice that the more the baby sucks, the more milk she produces

VI. Learnings from Country Experiences on Maternal Nutrition: Three Country Case Studies

Guatemala Case Study

What: In Guatemala, the USAID-funded Food and Nutrition Technical Assistance Project III (FANTA 2016) collaborated with the Institute of Nutrition of Central America and Panama to develop a set of food-based recommendations, dietary messages specific to the population, which were targeted to children 6-23 months and pregnant and lactating women (FANTA 2016).

How: In the first phase of the study, FANTA used Optifood, a linear programming software package, to identify nutrients for which pregnant and lactating women may be deficient based on local food sources and dietary patterns. They found that pregnant women were not meeting iron, zinc, and folate requirements, and lactating women were not consuming adequate zinc, vitamin B12, and vitamin C. Local diets did not allow pregnant and lactating women to meet their needs for these nutrients without supplementation and food fortification. In the second phase of the study, FANTA used the TIPs methodology to validate the food-based recommendations, assessing their feasibility and acceptability among a sample of 21 pregnant and lactating women.

Implementation: Based on these findings, FANTA developed food-based recommendations, which incorporated nutritional requirements of the population, dietary preferences and patterns, and nutritional content, availability, and cost of local foods. The food-based recommendations included iron folic acid supplementation, a zinc and folate-fortified drink (*atole espeso*) made with fortified flour, liver (to meet vitamin B12 needs), potatoes, oranges (to meet vitamin C needs for lactating women) and green leafy vegetables. Overall, following Phase 2, women consumed the fortified flour drink and liver at the recommended frequency and quantity, yet due to financial constraints, storage of perishable foods, and poor access to fresh foods, women were unable to implement the full set of food-based recommendations. Based on further testing using Optifood, FANTA revised the food-based recommendations to make them more feasible (Table 2). Food-based recommendations would need to be coupled with multiple micronutrient powders to ensure pregnant and lactating women were able to meet their needs for all necessary nutrients.

Table 2. Food-based recommendations for pregnant and lactating women in Guatemala

1. Drink 1 cup of thick fortified drink (*atole espeso*) made with fortified blended flour or fortified oats every day
Serving size: 2 tbsp. of dry fortified blended flour or fortified oats with a cup of boiled or treated water
2. Eat 2 servings of vegetables every day of the week
Serving size: 1 medium tomato, half a carrot, or 1 cup of chopped vegetables
3. Eat beef liver or chicken liver once a week
Serving size: 90 grams (3 ounces) of liver

USAID's MCSP rolled out e-learning courses in Guatemala and Zambia, which included key counseling content to build providers' knowledge and skills on maternal nutrition counseling.

In 2012, Guatemala's *Diplomado* e-learning course was developed by the FANTA III project to strengthen the knowledge and skills of health providers to improve the provision of services and counseling on nutrition at the primary health care level (i.e., in health posts) (Palmieri et al. 2017). MCSP supported MOH in conducting trainings to auxiliary nurses in the Western Highlands region through *Diplomado* to build their capacity in maternal, infant, and young child nutrition knowledge and competencies in counseling. The messages for health providers in *Diplomado* around maternal nutrition include:

- Promote the consumption of a variety of natural foods each day that aren't processed, such as fruits, vegetables, seeds, meats, and foods that have not been processed.
- Encourage pregnant women to breastfeed within one hour of birth and exclusively breastfeed for six months.
- Motivate the mother to reduce her consumption of processed foods, such as cup soups, candy, sweets, canned food, and all foods that contain an excessive amount of sodium, fat, or sugar.
- Explain why she should avoid consuming foods such as: fried chicken, French fries, tacos, and other foods that contain high amounts of saturated fats (meat fat, butter, margarine, cream, and oil that has been used in other preparations).

Bangladesh Case Study

What: In Bangladesh, Alive & Thrive partnered with Building Resources Across Communities (BRAC) (Alive & Thrive 2017b), an NGO in Bangladesh, to develop a comprehensive package of interventions aimed at improving maternal nutrition at scale, integrated into existing maternal, neonatal, and child health programs in Bangladesh (Alive & Thrive 2015; 2017a; 2017b).

How: Alive & Thrive conducted formative research to identify barriers and facilitators to optimal maternal nutrition practices. Findings showed that maternal diet was influenced by perceptions related to financial feasibility of improved diets and inequitable gender norms leading to little attention paid to women's diets. Based on the influence of social norms on maternal diet, Alive & Thrive used the Socio-Ecological Model of Behavior change, which recognizes the importance of engaging the larger community beyond just pregnant women in advocacy and community mobilization (Alive & Thrive 2017a).

Implementation: Roll out of integrated package of maternal nutrition interventions included:

1. **Advocacy:** Alive & Thrive facilitated advocacy efforts at the national, district, and local levels to build support and commitment for maternal nutrition programming through seminars and discussions with key policymakers, including members of parliament at the national level, and elected representatives on local union councils to share program experience and successes (Alive & Thrive 2015). Through these efforts, these key stakeholders established maternal nutrition as a priority area.
2. **Interpersonal communication and community mobilization:** Alive & Thrive provided home visits to families to deliver personalized counseling and support on maternal nutrition. Health workers reinforced five key topics during ANC and/or PNC: food diversity, food quantity, IFA supplementation, calcium supplementation, and weight gain monitoring (Alive & Thrive 2017a). To further support interpersonal communication and community mobilization efforts, Alive & Thrive developed materials to aid health workers in counseling on maternal nutrition, including a job aid with key messages for pregnancy and lactation; a poster to support health workers during home visits that can be left with families; and a flip chart with information on good nutrition for pregnant women to be used in social mobilization activities with husbands. The target audiences and formats for different mobilization activities were identified through formative research and situational analysis. Forums engaging husbands, influential community members, health workers, and local government officials were priority areas.
3. **Mass communication:** Alive & Thrive engaged community members to increase awareness of best practices to improve maternal nutrition through a variety of activities such as community events and interactive village theatre performances (Alive & Thrive 2015). Alive & Thrive developed posters for use in government facilities and health centers, which displayed key messages (see Table 3). Video clips were also shown to families and community members during social mobilization activities, which emphasized that each person's unique role in ensuring good maternal nutrition.
4. **Strategic use of data:** Alive & Thrive also developed tools to strengthen routine maternal nutrition data collection and management. The tools, such as observation checklists to ensure quality counseling, were developed using field test data and validated across a range of audiences (Alive & Thrive 2015).

Table 3. Recommended Maternal Nutrition Practices, Bangladesh

- Consume foods from 5 or more food groups daily, including: fish/meat & eggs; milk & dairy products; grains and other pulses; dark green leafy vegetables; and orange/yellow fruits/vegetables
- Increase the amount of food, energy, and protein according to needs in each trimester of pregnancy
- Take daily IFA and calcium supplements
- Track weight gain during pregnancy and aim to gain 10-12 kilograms

Kenya Case Study

What: In Kenya, MCSP used the Baby Friendly Community Initiative (BFICI) platform as means to integrate maternal nutrition (Kavle, Ahoya et al. 2019).

How and Implementation:

- During ANC, nurses counseled mothers in groups and also one-to-one at the health facility on maternal nutrition, EBF, complementary feeding, and maternal anemia (i.e., benefits of iron folic acid [IFA] supplementation, when to take IFA supplements, and how to manage temporary management of side effects), as part of the ANC package.
- During home visits and mother-to-mother support groups (M2MSGs), community health volunteers (CHVs) identified pregnant women in BFICI communities and urged them to start attending ANC and provided follow-up throughout pregnancy and postpartum. CHVs provided messaging given during ANC for pregnant women, including starting ANC early, attendance of four ANC visits, maternal nutrition, malaria in pregnancy, the benefits of IFA and managing side effects, and the importance delivering in a health facility.
- At childbirth, mothers who delivered in the facility, women were supported to initiate breastfeeding within 1 hour of delivery.

The CHVs also taught mothers with children less than 2 years of age about the importance of having kitchen gardens, which improved the dietary diversity of women and children through consumption of fruits and vegetables and selling of excess vegetables to purchase protein (chicken/eggs). Through M2MSGs, cooking demonstrations showed mothers how to cook green leafy vegetables (i.e., not overcook), how to prepare and modify foods for their children (i.e., consistency based on age—meat, porridge). Cooking demonstrations for complementary feeding also provide an opportunity to integrate maternal nutrition into IYCF programming.

Social Protection/Livelihoods Programming

Social protection services or livelihood programming can also complement traditional health system interventions if economic constraints are a primary barrier. Social protection interventions can contribute to improved maternal diet, for example, by providing food through food transfers or conditional cash transfers, which can facilitate increased access to health care and encourage use of health services. Social protection programs can enhance households' ability to provide care for mothers and young children, through targeting social transfers directly to women with young children, or through labor regulations that enable women to breastfeed while working. Social protection measures help to break the inter-generational cycle of malnutrition through increasing women's access to education, assets, and resources, while considering women's workload and time constraints. It is also important to promote strategies that enable households to diversify their diets and livelihoods—by introducing small livestock—which enables households to improve both their diets and socioeconomic status, while reducing their vulnerability to shocks.

VII. Key Resources

1. [Alive and Thrive](#)
2. [Food and Nutrition Technical Assistance \(FANTA\)](#)
3. [Infant and Young Child Nutrition \(IYCN\)](#)
4. [UNICEF](#)
5. [USAID's Maternal and Child Survival Program \(MCSP\)](#)
6. [World Health Organization](#)

Appendix I: ANC Contact Schedule

Table 4: ANC Contact Schedule—WHO ANC Guidelines

ANC Contact Schedule and Proposed Timing	Nutrition related Interventions	Key Actions and Considerations during ANC Contacts
<i>To be adapted to country context, based on local disease burden, health and nutrition needs of pregnant adolescents and women</i>		
Contact 1 or more: Up to 12 weeks	Administer daily 30 to 60 mg of elemental iron and 400 µg (0.4 mg) of folic (IFA) Food insecure regions: Increase daily dietary energy & protein & provide energy/protein supplementation	<ul style="list-style-type: none"> • Take diet history and counsel on healthy diet consisting of a variety of foods, including green and orange vegetables, meat, fish, beans, nuts, whole grains, oils and fruits • Counsel women on healthy weight gain in pregnancy based at the start of pregnancy • Address needs of women identified with undernutrition, and overweight, and obesity at any time in pregnancy, including communities in food-insecure and emergency settings • Counsel on anemia and the need to consume iron-rich foods • Counsel regarding why, when, how many, and how long to take IFA. • Discuss IFA side effects and counsel regarding how to manage side effects, if they occur and when to return for follow-up • Counsel on food taboos and cultural beliefs • Address individual barriers that may make it difficult for women to maintain a healthy diet during pregnancy • Counsel on hygiene and sanitation • Counsel on sleeping under ITNs and administration of IPTp-sulfadoxine-pyrimethamine (SP) (for pregnant women living in all areas with moderate to high malaria transmission regions). Refer to MCSP Controlling Maternal Anemia and Malaria brief. • In undernourished and food insecure populations: <ul style="list-style-type: none"> • Measure and record weight; MUAC to identify undernutrition • Balanced energy and protein dietary supplementation are recommended for pregnant women to reduce the risk of stillbirths and small-for-gestational-age neonates. • Consider distribution of energy-protein supplements in food insecure areas or areas without access to variety of foods • Nutrition education on increasing daily energy and protein intake is recommended for pregnant women to reduce the risk of low-birth-weight neonates

ANC Contact Schedule and Proposed Timing	Nutrition related Interventions	Key Actions and Considerations during ANC Contacts
Additional contacts: can be made by task-shifting to lay counselors, community health workers, etc.	Continue to administer daily 30 to 60 mg elemental iron & 400 µg (0.4 mg) of folic acid (IFA)	<p>In addition to the first contacts above, remember to:</p> <ul style="list-style-type: none"> • Monitor weight gain: <ul style="list-style-type: none"> • Insufficient weight gain: counsel on increased dietary intake and refer for therapeutic treatment if moderately or severely malnourished • Excessive weight gain: counsel on diet and risks associated with overweight and obesity • Counsel on why, when, how many, and how long to take IFA • Discuss side effects of IFA and counsel on how to manage side effects, if they occur and when to return for follow-up. Counsel on exclusive breastfeeding in the first six months after birth and maternal nutrition required for additional caloric expenditure.
Contact 2: 20 weeks	Continue to administer daily 30 to 60 mg elemental iron and 400 µg (0.4 mg) of folic acid (IFA)	
Contact 3: 26 weeks		
Contact 4: 30 weeks		
Contact 5: 34 weeks		
Contact 6: 36 weeks		
Contact 7: 38 weeks		
Contact 8: 40 weeks		

Source: Maternal Nutrition Programming in the context of the 2016 WHO Antenatal Care Guidelines: For a positive pregnancy experience, USAID's Maternal and Child Survival Program (MCSP), April 2018
<https://www.mcsprogram.org/resource/maternal-nutrition-programming-in-the-context-of-the-2016-who-antenatal-care-guidelines>

Appendix 2: Quality of Care Standards

Table 5: Quality of Care Standards for MNH and Child Health in relation to breastfeeding

<p>Quality statement 1.1b: Newborns receive routine care immediately after birth.</p> <p>Rationale: Routine care of newborns immediately after birth facilitates adaptation of the newborn to the new environment, meets his or her immediate needs in the best possible way, and avoids preventable complications (WHO 2016a).</p>	
Quality inputs	# 4. Health-care staff in the labor and childbirth areas of the maternity unit receive in-service training or regular refresher sessions in essential newborn care and breastfeeding support at least once every 12 months. (83.94)
Quality inputs	# 6 Health care staff in the labor and childbirth areas receive at least monthly drills or simulation exercises and supportive supervision in essential newborn care and supporting breastfeeding. (77.82)
Quality outputs/process	# 3 The proportion of all newborns who received all four elements of essential newborn care: immediate and thorough drying, immediate skin-to-skin contact, delayed cord clamping and initiation of breastfeeding in the first hour. (78.93)
<p>Quality statement 1.1c: Mothers and newborns receive routine postnatal care.</p> <p>Rationale: Routine postnatal care represents the use of best practices for prevention, early detection and treatment of complications in the mother and baby and counseling of mothers on how best to take care of themselves and their newborns. Exclusive breastfeeding is supported.</p>	
Quality inputs	# 3 The health facility has a written breastfeeding policy that is routinely communicated to all health care and support staff. (83.18)
Quality inputs	# 4 Health care staff in the maternity unit receive in-service training and regular refresher sessions in routine postnatal care and breastfeeding at least every 12 months. (83.04)
Quality inputs	# 7 The health facility has local arrangement to inform pregnant women and their families about the benefits and management of breastfeeding. (74.49)
Quality outputs/process	# 3 The proportion of all women in postnatal care wards or areas in the health facility who have documented problems of blood pressure, pulse rate, vaginal bleeding, lochia or breastfeeding. (84.02)
Quality outputs/process	# 7 The proportion of all healthy mothers on postnatal wards or areas in the health facility who received breastfeeding counseling and support from a skilled health care provider. (82.14)

Quality statement 1.9: No woman or newborn is subjected to unnecessary or harmful practices during labor, childbirth, and the early postnatal period (WHO 2016a).	
Rationale: Unnecessary and harmful practices can lead to complications and harm mothers and their newborns. They should be avoided and replaced with evidence-based health practices. Unnecessary or harmful practices are not used or practiced. These practices include: cesarean section (unless indicated); immediate bathing of the baby, keeping well babies in the nursery away from the mother, advertising and promotion of breastfeeding substitutes, and bottle-feeding.	
Quality inputs	# 3 The health facility does not give newborns food or drink other than breast milk, unless medically indicated, and does not give pacifiers (also called “dummies” or “soothers”) to breastfeeding babies (85.13)
Standard 1. Every child receives evidence based care and management of illness according to WHO guidelines (WHO 2018).	
Quality statement 1.2: All sick infants, especially small newborns, are thoroughly assessed for possible serious bacterial infection and receive appropriate care according to WHO guidelines.	
Quality measures Process/Outputs: #15. Proportion of all sick young infants admitted to the facility who were maintained on exclusive breastfeeding and/or received only expressed breast milk during hospitalization, up to discharge. (84.05)	
Quality statement #1.6 All infants and young children are assessed for growth, breastfeeding and nutrition, and their caregivers receive appropriate support and counseling, according to WHO guidelines.	
<i>“Rationale: Adequate feeding is essential for growth and development. Poor feeding during infancy and particularly during illness can have lifelong consequences. Young infants, particularly those with a low birth weight (< 2500 g), are at much greater risk for illness and death if careful attention is not paid to feeding and appropriate care. Exclusive breastfeeding gives young infants the best immune support and nutrition and enhanced growth and development. Breastfeeding also protects mothers against breast and ovarian cancer, improves birth spacing and protects them against type 2 diabetes. Infants and young children should be breastfed exclusively up to 6 months of age and progressively given complementary nutritious foods with continued breastfeeding up to 2 years. Children’s growth should be assessed according to weight for age of young infants and to weight for length (height) in children aged ≥ 2 months. All children < 2 years should be assessed for feeding problems and practices, and caregivers should be appropriately counseled on feeding. Preterm and low-birthweight infants (< 2500 g) should be monitored closely and their mothers given support for exclusive breastfeeding or alternative feeding (expressed breastmilk, donor breast milk or formula). The health facility should be baby-friendly and have a written breastfeeding policy that is routinely communicated to all staff, who should be trained in implementing the policy.”</i>	
Quality measures: Inputs	#1 The health facility has a written, up-to-date policy for exclusive breastfeeding and appropriate feeding, according to WHO guidelines. (93.37)
Quality measures: Inputs	#2. The health facility maintains a baby-friendly status that supports breastfeeding according to WHO guidelines. (89.03)
Quality measures: Inputs	#4 The health facility has the necessary supplies and materials to support breastfeeding and, when appropriate, alternative feeding (feeding cups and spoons, infant formula, nasogastric tubes, syringe drivers, IV fluids, and tubing). (89.92)
Quality measures: Inputs	#5. The professional staff of the health facility who care for children receive training and regular refresher sessions in counseling on breastfeeding and optimal feeding and nutrition of infants and young children at least once every 12 months. (88.49)
Quality measures: Process/Output	#11 Proportion of all newborn infants in the health facility who receive fully established breastfeeding at the time of discharge. (85.22)
Quality measures: Outcome	#12. Proportion of caregivers in the health facility who have received counseling on breastfeeding and nutrition to ensure continued, appropriate feeding of the children in their care. (82.94)

Quality statement 1.7: All children at risk for acute malnutrition and anemia are correctly assessed and classified and receive appropriate care according to WHO guidelines.

Rationale: Acute malnutrition is common in children, particularly infants and young children < 2 years, and anemia occurs in children with underlying conditions such as malnutrition, hookworm infestation, malaria and sickle-cell disease. Factors that contribute to malnutrition include poor feeding practices, lack of or inadequate breastfeeding, persistent or chronic diarrhea, measles and malaria. Parents and caregivers should receive appropriate counseling on breastfeeding, feeding practices and child nutrition. Infants aged < 6 months should be exclusively breastfed, and mothers should be encouraged to continue breastfeeding up to 24 months of age.

Appendix 3: Evidence on Barriers to Optimal Maternal Nutrition

Many barriers exist that impede adequate dietary intake in pregnant and lactating women that can be addressed in health programming. An MCSP-led literature review found that food intake during pregnancy and lactation was largely driven by personal preferences and cravings, food avoidance because of 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. 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 (Kavle and Landry 2017). A summary of key barriers to optimal maternal nutrition, based on findings from research studies from the literature review is found below.

- **Knowledge and beliefs of optimal diet during pregnancy and lactation:** Studies 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.
- **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. In Burkina Faso and Nigeria, the quality of diet during pregnancy was connected to small birth size.
- **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. 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. In Tanzania and Kenya, appropriate foods, such as broth, are considered to “provide strength” to lactating mothers.
- **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.
- **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 (i.e., vegetables, fish, meat and/or fruits) were avoided during pregnancy and eliminated from the diet, based on a wide range of cultural taboos and misinformation. 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.
- **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. 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.

- **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.” 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.
- **Reduction in food consumption during pregnancy:** Women also relayed deliberately eating less food during pregnancy because of 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.
- **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. 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.
- **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.
- **Intra-household food allocation:** In many countries, husbands and children eat before women in the household because of cultural norms; therefore, women often do not receive additional food. 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.
- **Food systems:** The process of growing, harvesting, processing, packaging, transporting, marketing, consumption, and disposal of food; are often managed by the private sector. Governments have a key role in creating an enabling environment that provides incentives for food system actors to sharpen focus on consumers, and vulnerable groups, with affordable access to nutritious food and knowledge about healthy diets, for example in maternal consumption of nutrient-rich foods and bio-fortified crops with high iron and zinc and vitamin during pregnancy and lactation. The private sector, civil society, and academia also have key roles in supporting governments to create healthy food systems.

Table 6: Key findings of MCSP studies and formative assessments to inform on maternal nutrition programming, by MCSP country

Methodology	Country	Key Findings	How findings were used to strengthen counseling and behavior change
Formative assessment/ research using TIPs	Egypt (Kavle et al. 2014)	<ul style="list-style-type: none"> ● Women stated that a pregnant woman’s diet should contain “good” and “beneficial” foods such as meat, fish, lentils, chicken, eggs, and milk, as well as various fruits and vegetables ● The actual consumption of “beneficial” foods during pregnancy is sometimes limited by personal preferences and affordability of foods 	<ul style="list-style-type: none"> ● A counseling guide was developed for health providers, which provided guidance on healthy eating during pregnancy and lactation, including IFA supplements and reasons for taking them

Methodology	Country	Key Findings	How findings were used to strengthen counseling and behavior change
		<ul style="list-style-type: none"> • Junk food and caffeinated beverages as well as salty, pickled, and spicy foods are considered “bad” during pregnancy • Women indicated that they generally consume more foods during lactation than they usually do, whether non-pregnant or during pregnancy • The quantity of foods consumed was perceived to be associated with the amount of breast milk produced • Women routinely receive iron and folic acid (IFA) supplementation during ANC; however, some mothers said they do not know why IFA is important or the reasons for taking IFA 	
	Mozambique (MCSP 2017a)	<ul style="list-style-type: none"> • <i>Xima</i> (from cassava, sorghum or maize flour), rice, leafy greens (cassava, pumpkin, spinach), carrots, beans (<i>bóere</i>), <i>nicusse</i> fish, crab, eggs, stews made with peanut or coconut, pineapple, banana, melon and papaya were consumed during pregnancy • Some respondents reported knowing what to eat, yet not accessing these foods, because of a lack of finances • Most pregnant women went to ANC to receive iron and folic acid supplements and deworming pills. However, the visits were often not timely or frequent, and problems with taking the pills were commonly mentioned • Most women could not explain the importance of taking iron-folic acid supplements and relayed they hadn’t been told about their benefits by the nurses 	<ul style="list-style-type: none"> • A counseling guide was developed for health providers to address maternal nutrition, maternal anemia (IFA, deworming, and anti-malarials), and perceptions of insufficient breast milk • National anemia prevention and treatment materials were developed alongside the Ministry of Health, which were pre-tested across the country
Implementation science, formative research Study	DRC (Kavle et al. 2018)	<ul style="list-style-type: none"> • Mothers discussed problems producing enough breast milk to feed their infants, because of inadequate maternal nutrition 	<ul style="list-style-type: none"> • Revised national IYCF counseling cards in collaboration with the Ministry of Health, based on study findings, which included key

Methodology	Country	Key Findings	How findings were used to strengthen counseling and behavior change
		<p>and long periods of separation of mother and baby</p> <ul style="list-style-type: none"> • <i>Sombé</i> (a dish mainly composed of cooked cassava leaves with oil) was often cited as a good food for mothers, with a beneficial effect on their breast milk production • Foods that were mentioned as taboo for breastfeeding mothers included game meat (snake, monkey, crocodile), sugar cane, pineapple, mango, and sweet potato leaves. Mothers conveyed they would not consume these foods given the perception of these foods would deteriorate the quality of the breast milk and provoke diarrhea in the child 	<p>messages on maternal nutrition. Health providers were trained on counseling mothers using these counseling cards during community visits and at health facilities</p>
	Tanzania (MCSP 2017b)	<ul style="list-style-type: none"> • The perception of not having sufficient breast milk was common among many mothers, and a consequence of the quality and quantity of food consumed by mothers during the postpartum period • Mothers seemed to favor foods that were perceived to increase the quality and quantity of breast milk including porridge, ugali, tea, and rice. • Vegetables and fruits were rarely mentioned as beneficial. 	<ul style="list-style-type: none"> • Developed a job aid to counsel women on exclusive breastfeeding and LAM, LAM song, and key counseling messages on improving maternal nutrition during breastfeeding and addressing insufficient breast milk, which were rolled out in MCSP areas with the MOH

Appendix 4: Process for Anemia Material Development and Rollout

Anemia material development and rollout took place from January—September 2018, and included the following steps:

Development of preliminary materials

- Developed Terms of Reference for the creation of materials, identifying the why, what, how, who, and when, and building consensus with the MOH Nutrition & Health Promotion Departments.
- Developed a creative brief for a flip chart, outlined topics, drafted key messages, and worked with an illustrator to develop preliminary illustrations. Messages were based on key findings from Trials of Improved Practices Assessment.
- Presented draft messages and layout of flip chart with preliminary illustrations to the MOH SBCC Technical Working Group, which was led by the Nutrition Department, with participation from the Health Promotion Department and other key partners.
- Developed a second draft of key messages incorporating feedback from the Technical Working Group. Shared draft with MCSP nutrition officers in the field, allowing incorporation of their experience into the materials' key messages.

Development of first draft of the counseling package

- Developed first draft the flip chart and met with the Technical Working Group to obtain feedback. Participants of the Technical Working Group advised to also develop a poster summarizing the information of the flip chart for use during one-on-one counseling, leaving the flip chart for group counseling; and to develop an algorithm to aid health providers in identifying side effects to IFA supplementation and providing counseling tailored to each individual pregnant woman's experiences with IFA supplements.
- Developed the full package of counseling materials (flip chart, poster, and algorithm) along with pre-test guides and tools, shared materials with Technical Working Group and incorporated their feedback.
- Pre-tested materials with MOH in health facilities and communities in three provinces.
- Incorporated the results of the pre-test into the materials and presented final drafts to the Technical Working Group.

Presentation of final counseling package for approval

- Submitted final version of the materials for approval by the National Director of Public Health.
- The MOH Department of Nutrition presented the materials at the National Directorate of Public Health SMT meeting and approval was granted within one month.

Lessons Learned

- Identifying the best platform (the MOH SBCC Technical Working Group) to bring together the MOH and key technical partners for their input on material development provided a convenient avenue through which to establish their ownership and buy-in throughout the process.
- Developing a Terms of Reference and presenting creative briefs to the MOH and key partners beginning in the initial stages was important to build consensus among partners and define the audience, purpose, objectives, content, tone, and function of the materials.
- Quick approval process (one month) was because of participation of MOH and partners from the beginning of material development.

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