Introduction of multiple micronutrient supplements (MMS) through antenatal care: Training manual for Lady Health Workers

Participants' training manual

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Acknowledgment

The *Advancing Maternal Health through Implementation Research on MMS* (AMMI) project is being conducted by Nutrition International in partnership with the Nutrition Wing of the Ministry of National Health Services, Regulations and Coordination Government of Pakistan (MoNHSR&C) with the support and guidance of the Directorate General Health Services and Integrated Health Program of Khyber Pakhtunkhwa, the District Health Office of Swabi, Khyber Pakhtunkhwa and the MMS Technical Working Group. This training manual was adapted from the AMMI project. This manual draws on the standard training for healthcare providers that supported the transition from iron folic acid supplementation (IFAS) to multiple micronutrient supplementation (MMS) in antenatal care (ANC) services across district Swabi, Khyber Pakhtunkhwa, Pakistan in 2022. It was developed as the minimum amount of training that healthcare providers should receive before providing MMS. The findings from AMMI are guiding a more comprehensive package that is designed to drive and sustain adherence, this package is being evaluated and results will be available in October 2024. In scale up planning, this manual should be considered alongside the new findings and enhanced resources.

This manual was developed by Nutrition International with input and guidance from the Nutrition Wing of the MoNHSR&C.

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Abbreviations and acronyms

AMMI: Advancing Maternal Health through Implementation Research on MMS

ANC: Antenatal care

DHIS2: District Health Information Software 2

EML: Essential Medicine List

HCF: Healthcare facility

IFAS: Iron and folic acid supplementation

LHS: Lady Health Supervisors

LHWs: Lady Health Workers

MMS: Multiple micronutrient supplementation

MNP: Multiple micronutrient powder

MoNHSR&C: Ministry of National Health Services, Regulations and Coordination Government of Pakistan

RAE: Retinol activity equivalent

RDA: Recommended dietary allowance

SOPs: Standard operating procedures

UL: Tolerable upper intake level

UNIMMAP: United Nations International Multiple Micronutrient Antenatal Preparation

WHO: World Health Organization

General guidelines for program planners

Even if supply is available, before embarking on training, program planners are advised to think through the following fundamental components:

- **Logistics and distribution plan of multiple micronutrient supplementation (MMS):** Develop a micro plan specifying how the MMS commodities will be managed from the warehouse to the end user with clear timelines. Detail where the MMS will be warehoused (including storage and climate control of commodity, stock control), health system channel(s) that will be used for distribution to facilities as well as the last mile distribution points, frequency of distribution and plans for resupply.

- **Implementation and supporting materials:** Develop a program implementation plan that details the systematic introduction of MMS into the antenatal care (ANC) platform. Develop or adapt program guidance, standard operating procedures (SOPs) tools and job aids (i.e. take-home sheets, counselling cards, frequently asked questions) that will support the transition. These should be based on the local context, health system, existing ANC guidelines and resources.

- **Management of anaemia:** Based on local and global guidelines, consider how best to support appropriate diagnosis and clinical care for pregnant women who are anaemic and ensure the program SOPs reflect this. Ensure a treatment dose of iron continues to be available in the supply chain.

- **Monitoring plan:** Develop a monitoring plan for ongoing program monitoring, course correction and learning. The supporting tools and methods should feed into existing routine monitoring systems where possible. Where District Health Information Software 2 (DHIS2) (which includes new indicators for MMS) is not yet rolled out, short-term systems may be required. Engage in continuous monitoring and course correction through supportive supervision mechanisms.

- **Training plan:** Develop a detailed plan including the identification of the cadre and number of participants who should receive this training and the master trainers who will be responsible for cascading this training. The training should be modified to suit the needs of the participants.

- **Sustainability plan:** Consider the long-term aspects of maintaining this program over time such as procurement, sustained financing, and ongoing service delivery including supportive supervision, refresher training and reprinting of job aids. Build in ongoing course correction and learning.

Training Overview

CONTEXT OVERVIEW

The Government of Pakistan's Maternal Nutrition Strategy (2022-2027) outlines the government's commitment to addressing the maternal nutrition situation in the country and includes a recommendation to implement MMS as part of ANC services for pregnant women. The Nutrition Wing of the Ministry of National Health Services, Regulations and Coordination (MoNHSR&C) has been working with Nutrition International to conduct implementation research to look at the introduction of MMS to replace iron folic acid supplementation (IFAS) during antenatal services in Pakistan since 2021. The research focuses on effective implementation approaches to inform sustainable transition and scale up and ensure maximum health impact of MMS (1,2).

To undertake the implementation research, MMS had to be first introduced into the ANC platform in place of IFAS. Swabi district, located in Khyber Pakhtunkhwa province was selected as the pilot area for the project. Beginning in April 2022, with the support of federal, provincial and district health officials and local stakeholders, all newly enrolled pregnant women accessing public ANC services in Swabi were offered MMS. To further support this transition from IFAS to MMS, a 'standard' implementation package was developed. This included training for healthcare providers on MMS, the development of new standard operating procedures, a behaviour change strategy and materials, a bolstered program monitoring system and a strengthened supply chain.

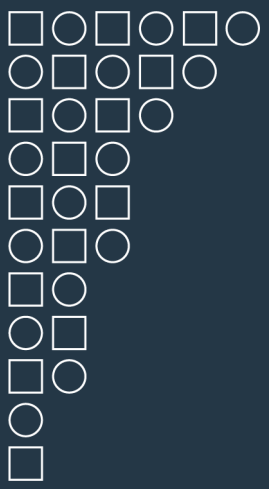
The training manual used for this 'standard' implementation package forms the basis for this training and is being shared to support the wider scale up efforts. It was developed as the minimum amount of training that healthcare providers should receive before providing MMS. The findings from the *Advancing Maternal Health through Implementation Research on MMS* (AMMI) project are guiding a more comprehensive package that is designed to drive and sustain adherence, this package is being evaluated and results will be available in October 2024. In scale up planning, this manual should be considered alongside the new findings and resources.

Nutrition International is available to guide local adaptation, design and planning to optimize the use of this manual and the accompanying package of tools.

PURPOSE AND CONTENT OF THE TRAINING

The in-depth comprehensive two-day training is designed to guide and support healthcare providers in providing MMS instead IFAS to non-anaemic pregnant women during their ANC contacts through public healthcare facilities in Pakistan. This manual serves as a reference guide to accompany this training.

This manual is divided into the following modules: 1) Getting started, 2) Nutrition during pregnancy, 3) From IFAS to MMS, 4) Key messages of the provision of MMS, 5) MMS Take Home Sheet, 6) SOPs and 7) Monitoring and reporting. It draws on materials used in the implementation research (AMMI project).



MODULES

Module 1: Getting started

This module presents the background overview of the manual and key definitions which will be further explored in upcoming modules.

1.1. BACKGROUND TO MMS INTRODUCTION

ANC has been recognized as a strategic platform to deliver services, promote health and prevent diseases.

In light of the evidence on MMS' effectiveness and cost-effectiveness, the World Health Organization (WHO) updated its ANC guidelines in 2020, recommending the administration of MMS instead of IFAS for preventative care (rather than curative care) during pregnancy and recommended implementation research in settings where the transition is being considered (3).

The Government of Pakistan's Maternal Nutrition Strategy (2022-2027) outlines the government's commitment to addressing the maternal nutrition situation in the country and includes a recommendation to implement MMS as part of ANC services for pregnant women (4).

1.2. KEY DEFINITIONS (more detailed explanations provided within the manual)

Iron folic acid supplement (IFAS): A prenatal supplement that contains 30-60 mg of iron and 400 mcg of folic acid (5).

Multiple micronutrient supplementation (MMS): A prenatal micronutrient supplement that contains 15 vitamins and minerals, including iron and folic acid (3).

Adherence (related to MMS): WHO recommends MMS to be taken daily during pregnancy to prevent anaemia. For pregnant women to receive the most health benefits from the MMS tablets, high adherence throughout pregnancy is required (5). Therefore, adherence is the extent to which a pregnant woman takes MMS daily.

Module 2: Nutrition during pregnancy

This module discusses the increased maternal micronutrient needs and the importance of a balanced, nutritious diet and adequate supplementation during pregnancy.

2.1. INCREASED NUTRITIONAL NEEDS OF PREGNANT WOMEN

During gestation, nutritional needs are increased to meet the physiological requirements, sustain fetal growth and development, protect the health of the mother during pregnancy and build her capacity to effectively breastfeed.

- Estimated energy requirements: Women who have a normal pre-pregnancy body weight require an additional +340 calories/day during their second trimester and +452 kcal/day during their third trimester (6).

- Micronutrient requirements: Compared to non-pregnant women, the majority of micronutrients are increased during pregnancy. Table 1 presents the Recommended dietary allowance (RDA) of selected micronutrients (6).

Globally, many pregnant women do not meet their dietary requirements through food alone. This can have negative consequences on their health and the health of their baby. For example, a woman's daily iron requirement nearly doubles during pregnancy, increasing from 15 mg/day and 18 mg/day for non-pregnant women aged 14-18 years old and 19-50 years old, respectively, to 27 mg/day for pregnant women aged 14-50 years old (6). Therefore, to fulfill their nutritional requirements, pregnant women are advised to consume a balanced, nutritious diet, in addition to daily adequate micronutrient supplementation.

Table 1. Recommended dietary allowance (RDA) of selected micronutrients for non-pregnant vs. pregnant women

	Non-pregnant		Pregnant	
RDA *	**Adolescent girls (14-18 years)**	**Women (19-50 years)**	**Adolescent girls (14-18 years)**	**Women (19-50 years)**
Iron (mg/day)	15	18	27	27
Folate (µg/day)	400	400	600	600
Vitamin A (µg RAE/day) **	700	700	750	770
Vitamin D (µg/day)	**5**	**5**	**5**	**5**
Vitamin E (mg/day)	15	15	15	15
Vitamin C (mg/day)	65	75	80	85
Vitamin B6 (mg/day)	1.2	1.3	1.9	1.9
Vitamin B12 (µg/day)	2.4	2.4	2.6	2.6
Zinc (mg/day)	9	8	12	11
Vitamin B1 (mg/day)	1.0	1.1	1.4	1.4
Vitamin B2 (mg/day)	1.0	1.1	1.4	1.4
Niacin (mg/day)	14	14	18	18
Copper (µg/day)	890	900	1000	1000
Selenium (µg/day)	55	55	60	60
Iodine (µg/day)	150	150	220	220
Calcium (mg/day)	**1300**	**1000**	**1300**	**1000**

Reference: *Institute of Medicine 2006* (6)
Abbreviations: RAE: Retinol activity equivalent; RDA: Recommended dietary allowance.
* **Bold font** represents an adequate intake (AI)
** Tolerable upper intake level (UL) of vitamin A: 2800 µg RAE/day for pregnant adolescent girls aged 14-18 years; 3000 µg RAE/day for pregnant women aged 19-50 years (6)

2.2. THE IMPACT OF POOR NUTRITION ON PREGNANCY AND BIRTH OUTCOMES

Poor nutrition during pregnancy can lead to micronutrient deficiencies which could result in adverse maternal and fetal outcomes (7). For instance, deficiencies in iron, folate, vitamin A and vitamin B12 can lead to anaemia – which is a serious global public health concern (8). The causes of anaemia are often multifaceted, but in lower-middle-income countries like Pakistan, iron deficiency is one of the major contributors to anaemia (8).

Anaemia during pregnancy elevates the mother's risk of mortality and increases the risk of adverse pregnancy and birth outcomes, including preterm birth and low birth weight (i.e. babies being born too early or too small) (7). Anaemia can also lead to maternal fatigue, weakness and dizziness.

2.3. HEALTH BURDEN IN PAKISTAN

Pakistan is experiencing high burden of maternal and birth outcomes including neonatal mortality rate, maternal mortality ratio, low birth weight, and stunting. Evidence has also shown that women of reproductive age are facing a triple burden of malnutrition including underweight, overweight/obesity, and micronutrient deficiencies notably a high prevalence of anaemia. Well-nourished women have safer pregnancies and healthier birth outcomes which also affect the health status of future generations. (9–14)

2.4. WELL-BALANCED DIET AND ADEQUATE MICRONUTRIENT SUPPLEMENTATION DURING PREGNANCY

To prevent anaemia and other micronutrient deficiencies and decrease the risk of diet-related health conditions, pregnant women are recommended to consume:

1. A healthy balanced diet composed of a variety of foods from the different food groups (15), including cereal grains and grain products (chapatti, bread, rice, etc.), vegetables, fruits, milk and milk products (yogurt, cheese, kheer, feerni or other milk-based products), proteins (meat, fish, eggs, pulses, etc.), with emphasis on iron-rich foods

   and

2. Daily micronutrient supplementation that includes 30-60 mg of iron and 400 mcg of folic acid as recommended by the WHO (5)

Micronutrient supplements (such as MMS) are designed to complement the diet and should not be used as substitutes for meals or whole foods (3).

Module 3: From IFAS to MMS

This module describes and compares MMS and IFAS and discusses considerations for transitioning from IFAS to MMS in Pakistan.

3.1. DEFINITION OF IFAS vs. MMS

IFAS is the abbreviation for iron and folic acid supplementation, an antenatal supplement containing 30-60mg of iron and 400mcg of folic acid (5).

MMS is the abbreviation for multiple micronutrient supplementation. MMS is an antenatal supplement that provides 13-15 micronutrients (minerals and vitamins), including iron and folic acid, all combined in a single tablet. MMS is different from MNP (micronutrient powder) which are used for children (3).

3.2. MMS COMPOSITION

MMS is available in various formulations. The United Nations International Multiple Micronutrient Antenatal Preparation (UNIMMAP) is the standard formulation that is widely available and now included in the WHO's Essential Medicine List (EML) (2022) (16). MMS comprises 10 vitamins and 5 minerals at recommended daily amounts for pregnant women (see Table 2) (17). The presence of vitamin C, vitamin A and vitamin B2 increases the absorption of the available iron in the MMS tablet (17).

Table 2. The composition of vitamins and minerals in one MMS tablet – UNIMMAP formulation

Vitamin B1	1.4 mg
Vitamin B2	1.4 mg
Vitamin B6	1.9 mg
Vitamin B12	2.6 µg
Vitamin A	800 µg
Vitamin D	5 µg
Vitamin E	10 mg
Vitamin C	70 mg
Niacin	18 mg
Folic Acid	400 µg
Zinc	15 mg
Copper	2 mg
Selenium	65 µg
Iodine	150 µg
Iron	30 mg

Reference: MMS-TAG and MNF, 2020 *(18)*, WHO, 2021 *(19)*

Abbreviations: MMS: Multiple micronutrient supplement; UNIMMAP: United Nations Multiple Micronutrient Antenatal Preparation.

3.3. BENEFITS OF MMS

MMS can help improve maternal and birth outcomes. Although, MMS and IFAS are equally effective at reducing the risk of anaemia in pregnancy, MMS is more effective than IFAS at reducing the risk of low birth weight, small for gestational age, pre-term birth and neonatal mortality (3,5). MMS can contribute to meeting the micronutrient requirements during pregnancy. These benefits of MMS help address the health concerns presented in Module 2, section 2.3. Further details on MMS will be provided in the next modules.

Module 4: Key messages on the provision of MMS

This module discusses key messages on the provision of MMS to pregnant women as part of preventative ANC, including MMS initiation, dosage, intake and safety.

4.1. PROVISION OF MMS

MMS will be provided free of cost to non-anaemic pregnant women accessing public ANC services (as defined by the distribution plan).

When the pregnant woman has her ANC contact, she will be offered a bottle of MMS instead of IFAS. The MMS will be provided in an unopened bottle of 180 tablets.

Further details regarding MMS and the protocol for its introduction to pregnant women will be covered in subsequent modules of the training.

4.2. WHO GETS MMS?

MMS is intended for pregnant women who are enrolled in public ANC services. MMS is for preventative care and is provided, instead of IFAS, to non-anaemic pregnant women.

The MMS formula was tailored to meet the particular nutritional requirements of pregnancy based on the RDAs. It is therefore not intended for use by other age groups, children or men. Therefore, MMS tablets are solely for the pregnant woman's consumption and should not be distributed to others.

When a pregnant woman is suspected to be anaemic, the recommended protocol for managing anaemia should be followed.

4.3. INITIATION, DOSAGE AND INTAKE OF MMS

As soon as a woman knows she is pregnant, she is advised to promptly seek ANC where, as part of this service, she will be provided with a bottle of MMS if she is non-anaemic. It is recommended that she begins taking one whole MMS tablet per day as early in pregnancy as possible, continuing daily throughout her entire pregnancy. Any remaining MMS tablets can be consumed daily post-delivery (20). Details on the provision of the MMS bottles will be presented in the SOPs.

The MMS tablet should be swallowed with a glass of clean water. It should not be chewed or crushed, should not be taken with tea or coffee and should not be consumed with calcium or calcium-rich foods (like milk) as they can decrease the absorption of iron in the body.

If the pregnant woman forgets to take her MMS tablet, she should resume her regular regimen by taking one tablet per day. It is important not to exceed the recommended daily dosage, meaning she should not take two tablets the following day to compensate for the missed dose. Similarly, if she stopped taking MMS for any reason and wishes to resume, she should continue taking just one tablet per day.

MMS should be stored in its original bottle and tightly closed to prevent damage to the tablets. The MMS bottle should be kept away from direct sunlight, heat, and moisture, in a dry and secure location and out of reach of children.

4.4. MMS ADHERENCE

It is important for pregnant women to take MMS daily to receive the most health benefits from the MMS tablets. This consistent intake is referred to as ‘adherence’.

Adherence refers to the degree to which a patient follows the guidance provided by their healthcare worker/practitioner. In the case of MMS, adherence is simply defined as taking one MMS tablet daily throughout a woman’s pregnancy.

As healthcare providers, it is essential to assess and encourage pregnant women's adherence to MMS during every ANC contact, while maintaining a non-judgmental approach. Some sample questions include:

- Did you start taking your MMS?
- Have you been able to take your MMS daily?
- What do you think are some reasons for you not to take your MMS daily?
- Would you like to discuss how I can support you with overcoming these barriers?

4.5. THE ADHERENCE GAP (21)

- Women who received ANC in 1st trimester: 55%
- Women who attended 4+ ANC visits during pregnancy: 51%
- Women who received any ANC from skilled providers: 86%
- Women who took iron tablets or syrup: 59%
- Women who took iron tablets or syrup for 90+ days during pregnancy: 29%

➔ The difference between receiving the iron tablet vs. taking the tablet is termed the "adherence gap". Adherence is essential for the intervention to achieve its intended impact on health and pregnancy outcomes.

4.6. SAFETY AND POSSIBLE MINOR DISCOMFORTS AND THEIR MANAGEMENT

A pregnant woman can take MMS if she has diabetes, high blood pressure, heart disease, or a history of miscarriage.

MMS is safe and does not have major side effects. Pregnant women may experience minor discomfort, which is usually temporary until their body adjusts to the iron in the tablet. Some of these potential minor discomforts include constipation, upset stomach, mild headaches and/or nausea. These are generally less pronounced than what may be experienced with IFAS, as the iron dosage in MMS is lower (22).

Module 5: MMS Take Home Sheet

This module presents the MMS Take Home Sheet including its content and utilization.

5.1. CONTENT OVERVIEW

The MMS Take Home Sheet was designed as a job aid in Urdu for the AMMI project. It meets low literacy requirements and can be adapted and translated as needed.

5.2. USE OF MMS TAKE HOME SHEET

Healthcare providers can use this MMS Take Home Sheet as reference when explaining to the pregnant woman about MMS.

When giving the pregnant woman her MMS bottle, healthcare providers should also provide her with a copy of the MMS Take Home Sheet for her personal reference.

Module 6: Standard operating procedures (SOPs)

This module explains the SOPs for providing MMS for pregnant women during ANC contacts.

6.1. CONTENT OVERVIEW

The SOPs were developed for healthcare providers as part of the AMMI project and may require adaptation and translation as needed.

6.2. USE OF THE SOPs

The following SOPs outline the processes for providing MMS to pregnant women through routine ANC both at public health facilities and in the community through Lady Health Workers (LHWs):

- Based on government guidelines, at each ANC contact, a set of recommended services are offered to pregnant women. Healthcare providers are urged to adhere to these recommendations according to government protocols. For guidance on the provision of MMS instead of IFAS, healthcare providers are asked to follow the SOPs.
- According to WHO guidelines, it is recommended that pregnant women have a minimum of 8 ANC contacts. Ideally, the first ANC contact should take place as early in the pregnancy as possible (5).
- Screening pregnant women for anaemia is crucial and should be conducted according to the existing local protocols. Anaemia screening results should be documented in the relevant existing records.
- If anaemia is suspected:
    - The appropriate protocol for managing anaemia should be followed based on its severity. MMS should not be initiated (or continued) at this point.
    - MMS is intended for preventive care and should be initiated (or continued) if there is no anaemia present (or if the anaemia has been managed/resolved).
- If no anaemia is suspected:
    - MMS is dispensed to pregnant women in unopened bottles containing 180 tablets, which corresponds to a six-month supply of MMS.
    - MMS is intended to be taken as a supplement to an adequate nutritious diet. Therefore, as an integral part of ANC services, it is important to continue providing nutrition counselling to emphasize the importance of consuming a balanced and nutritious diet.
    - At each ANC contact, it is important to address any adherence issues during counselling.
    - During each ANC contact, pregnant women should be reminded to take their MMS daily. Pregnant women should also be reminded to come back to ANC for their follow-up ANC contact.

Module 7: Monitoring and reporting

This module elaborates on the MMS monitoring forms that were created for the AMMI project and shows how these additional forms are integrated within the existing routine monitoring systems and protocols in Pakistan. This can be adapted, based on the program's monitoring plan, the status of the DHIS2 rollout and the use of the new MMS indicators.

7.1. PURPOSE OF MONITORING

The purpose of monitoring is to collect, review and learn from data on a regular basis to better understand the program, its effectiveness, whether it is achieving the intended targets and to identify areas for improvement in real-time.

During the project design phase, a monitoring plan is established to structure this system and define what is collected, how, when and by whom.

7.2. HOW TO MONITOR MMS

MMS is a new commodity and has not been included in the government routine monitoring systems. An indicator for MMS has recently been included in the DHIS2.

Where DHIS2 is not yet fully active, a complementary monitoring system will need to be established to capture this missing information and help track what commodities pregnant women receive, manage stocks and facilitate course correction as needed.

As part of AMMI, project specific monitoring forms (LHW-Form 1, Lady Health Supervisors (LHS)-Form 2, and Health Care Facility (HCF)-Form 3) were developed to collect information pertinent to the pregnant woman and to track MMS stock.

For LHWs:

During each ANC contact (even if the pregnant woman is not taking MMS), LHWs need to:

1. Record their visits with pregnant women in the LHW diary, following local existing protocols, and

2. Complete and submit their relevant project-specific form (i.e. LHW-Form-1)

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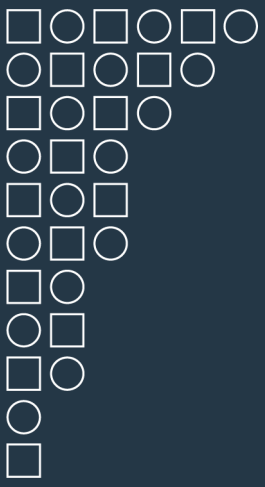

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