Transitioning from Iron Folic Acid (IFA) to Multiple Micronutrient Supplementation for Pregnant Women in Sierra Leone

Healthcare Workers Training Manual on Multiple Micronutrient supplement (multivitamins) in Sierra Leone

BACKGROUND

Micronutrient deficiencies are widespread among women of reproductive age in many African countries including Sierra Leone. Anaemia is the most common nutritional deficiency in the world and contributes to about 20% of all maternal deaths but other micronutrient deficiencies are also prevalent, especially vitamins A, B12, D, E, folate and calcium Macro and micronutrient deficiencies are common and coexist among women of reproductive age in low-to-middle income countries and can worsen during pregnancy given the greater need for nutrients for fetal development. These deficiencies are hard to address through diet alone and can be managed through supplementation. Maternal anaemia is considered a public health problem worldwide. One of the most common causes of anaemia during pregnancy is iron deficiency which can lead to a higher risk of premature birth or low birth weight babies.

Adequate nutrition during pregnancy has long been recognized as essential for the health of mothers and their infants. For years now, WHO has recommended iron-folic acid (IFA) supplements as part of routine antenatal care and it has been given to pregnant women in Sierra Leone as part of their national nutrition plan. The WHO guidelines for IFA provision are expected to help reduce adverse outcomes such as low birth weight (LBW), preterm birth, maternal anaemia at term, and maternal iron deficiency at term. There is evidence, however, that deficiencies in other micronutrients, such as zinc, iodine, and vitamin A affect foetal growth and development and these deficiencies are also prevalent amongst women of reproductive age in LMICs like Sierra Leone.

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According to the World Health Organization (WHO), little over 40% of pregnant women worldwide are anaemic while for Sierra Leone this number is even higher at over 54%1. In 2016, the WHO recommended iron and folic acid (IFA) supplements to be distributed as part of antenatal care with the aim to fight anaemia and keep the above-mentioned risks as low as possible in pregnant women and women of childbearing age. However, many countries have struggled to achieve high levels of IFA coverage and adherence due to several reasons including perceived side effects of IFA supplementation, poor quality of anti-natal care (ANC) services (which tend to be the entry point for delivery of IFA), lack of adequate supplies, etc.2

In 2019, the WHO updated these guidelines (published in 2020) to include multiple micronutrient supplements (MULTIVITAMINS) during pregnancy. The recommendation was based on research from low- and middle-income countries and stated that in countries where a transition to MULTIVITAMINS was being considered, implementation research to establish the impact of transitioning from MULTIVITAMINS to IFA should be conducted3. Global evidence has concluded that antenatal multivitamins are better than IFA in improving birth outcomes and have equivalent benefits for preventing maternal anaemia[4]. Randomized Controlled Trials (RCTs) in low- and middle-income countries have shown that MULTIVITAMINS during pregnancy significantly reduced the risk of low birth weight by 14%, pre-term births by 7%, for small for gestational age by 6%, and female neonatal deaths by 15% in comparison with IFA supplementation5.

Sierra Leone remains one of the countries with the highest maternal, newborn, and child mortality rates, with a maternal mortality ratio of 717 per 100,000 live births and neonatal, and infant mortality rates of 31 and 77 per 1,000 live births respectively[6]. Reducing micronutrient deficiencies among women of reproductive age and pregnant women in the country is critical to improving maternal, infant, and child health and economic development.

Objectives of the training module

The overall objective of this training module is for health workers (HWs) to be able to know the importance of Multiple Micronutrient Supplementation (multivitamins) compared to that of Iron Folic Acid (IFA) and its delivery mechanism. The training will aim to provide technical experience through participation and role-play.

Specific objectives will include:

- Understanding the scientific rationale for selecting multivitamins over IFA and identifying the different benefits provided by antenatal multivitamins compared to IFA
- Educating and guiding pregnant women about the importance of multivitamins during pregnancy

[1] Prevalence of anaemia in pregnant women (aged 15-49) (%) (who.int)

[2] Barriers and enablers for iron folic acid (IFA) supplementation in pregnant women - Siekmans - 2018 - Maternal & Child Nutrition - Wiley Online Library

[3] Nutritional interventions update: multiple micronutrient supplements during pregnancy (who.int)

[4] MMS-policy-brief-ethiopia-2019-10-18-web.pdf (nutritionintl.org)

[5] Haider B and Bhutta Z. (2017). Multiple-micronutrient supplementation for women during pregnancy. Cochrane Database Syst. Rev. 4: CD004905

[6] Demographic Health Survey 2019

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Understanding potential reasons for poor compliance with MULTIVITAMINS and potential solutions to these barriers

Learning Objectives	Methodology
• Define multivitamins • The importance of multivitamins	• Brainstorming • Presentation
• Explain multivitamins and their dosage	• Interactive presentation
• Counselling during ANC	• Presentation and role play
1. MULTIVITAMINS side effects, supplies, and recording	• Interactive presentation and practical

1. What is a Multiple Micronutrient supplement?

- Multiple Micronutrient Supplementation (MULTIVITAMINS) refers to the internationally recognized United Nations International Multiple Micronutrient Antenatal Preparation formula. UNIMMAP MULTIVITAMINS (hereinafter referred to as MULTIVITAMINS) contains 15 vitamins and minerals to meet the nutritional needs of pregnant women.
- Its formulation is developed by international health authorities, including the World Health Organization (WHO), United Nations University, and UNICEF.
- More than 20 years of research shows this formulation is safe, cost-effective, affordable, and more effective than iron and folic acid (IFA) supplementation, the current standard of care, MULTIVITAMINS has been consistently shown to improve maternal nutrition and reduce the risk of adverse birth outcomes including preterm birth, stillbirth, low birth weight, and small for gestational age, especially in anaemic and underweighting women.

Composition of MULTIVITAMINS and IFA

	MULTIVITAMINS	IFA
Micronutrients	Iron	Iron
	Folate (Folic Acid)	Folate (Folic Acid)
	Copper	
	Iodine	
	Selenium	
	Vitamin A	
	Vitamin B-1	
	Vitamin B-2	
	Vitamin B-3	
	Vitamin B-12	
	Vitamin C	
	Vitamin D	
	Vitamin E	

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	Zinc	
Cost per dose	U S D $0.011	**USD 0.010**

Comparing the potential benefits of MULTIVITAMINS and IFA

On average, compared to the IFA supplement, MULTIVITAMINS reduced the risk of:

	MULTIVITAMINS (%)	**IFA (%)**
Low birth weight	8-19	14
Preterm birth	2-13	7
SGA birth	2-10	6

The added benefit of MULTIVITAMINS over IFA

- The risk of infant mortality (from 0-6 months of age) decreases by 29% when a mother with anaemia takes MULTIVITAMINS during pregnancy
- The risk of stillbirth decreased by 8% among the general population of pregnant women. Among anaemic, pregnant women, the risk decreases by 26%.
- The risk of a child being born pre-term by decreases by 7%. Among pregnant, underweight women, the risk decreases by 16%.

The role of micronutrients and increased nutritional needs in pregnancy

- Micronutrients are vitamins and minerals that we need to consume every day in small quantities.
- Every person needs enough micronutrients from their diet, but this is particularly important for pregnant women given their increased nutritional needs for the healthy development of their baby and placenta.
- For example, folic acid is needed to prevent birth defects of the brain and spine; iodine is needed to prevent physical and cognitive stunting; zinc helps to prevent preterm delivery and iron reduces the risk of anaemia and low birth weight.
- Micronutrients are also needed for the baby to accumulate nutrient stores in his/her body (during the second and third trimesters of pregnancy), which are necessary for healthy infancy.

Recommended intakes for some micronutrients for nonpregnant and pregnant women

- The requirements of some nutrients, such as folate, iodine, zinc, vitamin B6 and iron are up to 50% higher during pregnancy
- Pregnant women also need more energy, protein, and other essential fatty acids, which need to be promoted through a healthy and varied diet.

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Recommended intakes for some micronutrients for nonpregnant and pregnant women.

Nutrient	Non-pregnant and nonlactating women	Pregnant women
Vitamin A	700 µg RAE	770 µg RAE
Vitamin B6	1.3 mg	1.9 mg (+46%)
Vitamin B12	2.4 µg	2.6 µg
Folate	400 µg DFE	600 µg DFE (+50%)
Vitamin C	75 mg	85 mg
Vitamin D	600 IU	600 IU
Vitamin E	15 mg	15 mg
Copper	900 µg	1000 µg
Iodine	150 µ	220 µg (+47%)
Iron	18 mg	27 mg (+50%)
Selenium	55 µg	60 µg
Zinc	8 mg	11 mg (+38%)

Micronutrient deficiencies during pregnancy/reproductive age

Poor pregnancy, maternal and child outcomes in pregnant women

Poor pregnancy outcomes associated with micronutrient deficiencies during pregnancy are common in Low Middle-Income countries These include:

- Preterm birth (<37 weeks of gestation) Prematurity is the world's number one cause of death in children under 5 years of age.
- Small for gestational age (birth weight < 10th percentile for a given gestational age) Both preterm and SGA infants have an increased risk of death.
- Low birth weight (birth weight <2500g)
- Stillbirths
- Neonatal mortality (< 28 days)
- Others: congenital anomalies, maternal and child cognitive impairment, maternal depression, etc.

MULTIVITAMINS dosing and targets for pregnant women

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	Period	How often
Health facility (Health workers)	• On the first visit, one bottle of MULTIVITAMINS of 180 tablets	A whole bottle of MULTIVITAMINS should be given to a pregnant woman on the first visit at the first trimester as early as 3 months (12 weeks)
Pregnant women at home	• A woman must visit the nearest health facility as soon as she misses her monthly flows	One tablet of MULTIVITAMINS daily should be taken by the pregnant woman for a period of 6 months
	• A pregnant woman should visit the health facility every month to check the status of the pregnancy and for provision of other health benefits during pregnancy • The MULTIVITAMINS should be taken for the 6 months during pregnancy	If the pregnant woman did not finish MULTIVITAMINS until giving birth, continue to take MULTIVITAMINS after delivery it is safe

MULTIVITAMINS administration

- During ANC, pregnant women should be counselled on the new MULTIVITAMINS product.
- Women should be well informed about the new product at every visit Pregnant women should understand why MULTIVITAMINS instead the usual iron folate they have been used
- Give a whole bottle of MULTIVITAMINS to a pregnant woman on the first visit
- MULTIVITAMINS should be taken through the mouth with water before or after a meal
- Ensure to take the tablet daily
- Taking MULTIVITAMINS at night and/or with food and water may help reduce side effects
- If there is MULTIVITAMINS remaining in the bottle after pregnancy, take the remaining supplements during the post-partum period and/ or while breastfeeding.

Multivitamin supplies: At the health facility;

List of things to be completed at the healthcare facility when distributing multivitamins includes:

- One whole bottle of 180 tablets of MULTIVITAMINS
- Recording forms include the register, tally sheet, and monthly health facility form

How to look after MULTIVITAMINS

- MULTIVITAMINS should
  - Be kept out of direct sunlight
  - Be kept cool
  - Not be frozen

- MULTIVITAMINS do not need to be kept in the cold chain used for vaccines
- In very hot weather, MULTIVITAMINS should be stored in a cool place if possible
- Always check the expiry date printed on the label
- Unopened bottles of MULTIVITAMINS will keep their strength under good storage conditions for a year or more depending on the date of manufacture
- Once opened, the tablet should be used within 1 year unless expired

Delivery of MULTIVITAMINS to a pregnant woman

- **A minimum of 180 tablets should be provided to the pregnant woman, during the first antenatal care visit (in the healthcare center)**
- The **earlier the supplementation starts, the better** (ideally before conception, given the role of folic acid in preventing birth defects of the brain, spine, or spinal cord in the first weeks of pregnancy)
- It is your responsibility to **inform pregnant women about the importance of MULTIVITAMINS during pregnancy.** You should carry educational leaflets with you that can give and explain to the women at the same time you deliver the bottle of MULTIVITAMINS supplements. It contains relevant information, such as the reason why they need to take the MULTIVITAMINS, how they should consume the supplements, and what to do in case of side effects.
- It is still important to advise pregnant women to follow a healthy and varied diet. MULTIVITAMINS does not cover other nutritional needs of pregnancy, such as protein, essential fatty acids, energy, calcium, antioxidant compounds, etc. which need to be obtained from the diet.

Compliance and Role of the health worker

- You have a crucial role in assessing and reinforcing compliance to MULTIVITAMINS in every ANC visit/contact
- Like all supplementation regimes, MULTIVITAMINS are most effective when compliance among pregnant women is high
- At every visit, try to understand any causes of poor compliance and give appropriate advice. A pregnant woman may not be taking the MULTIVITAMINS because of a lack of knowledge

It is your role to inform and deliver written and verbal information about why and how the MULTIVITAMINS should be taken

- **misconceptions about possible undesirable outcomes** (e.g., afraid of delivering a larger baby)

You can reassure the woman that the MULTIVITAMINS will not make the baby grow or gain weight in excess.

- **forgetfulness**

You can advise the woman to take the supplement at the same time every day (to create a routine), and ask a close family member to remind her.

- **side effects (e.g. nausea, vomiting, stomach pain)**

If the woman complains of side effects, you can advise her to take the supplement just before going to sleep, or to take it with a meal instead of on an empty stomach; you can also assure her that these side effects may be temporary and it is important to continue taking the supplements.

Conclusions

- Pregnant women have higher needs for micronutrients. Various nutritional deficiencies are common in this population and can lead to poor pregnancy and birth outcomes.
- Recent studies show that MULTIVITAMINS when compared to iron and folic acid alone can reduce the risks of preterm birth, low birth weight, being born small for gestational age and stillbirth. These benefits are even greater for anaemic and underweight women.
- **A minimum of 180 tablets/pills of MULTIVITAMINS should be delivered as early as possible in the pregnancy**
- Compliance with MULTIVITAMINS should be frequently monitored and reinforced on antenatal care visits.