POLICY BRIEF: ETHIOPIA

NUTRITION INTERNATIONAL
Nourish Life

COST-EFFECTIVENESS OF TRANSITIONING FROM IRON AND FOLIC ACID TO MULTIPLE MICRONUTRIENT SUPPLEMENTATION FOR PREGNANCY

COST-EFFECTIVENESS AND INVESTMENT CASE

In Ethiopia, transitioning from IFAS to MMS is expected to....

Avert	**1,561,983**	DALYs*
Prevent the deaths of an additional	**19,677**	children
Yield benefits that are	**171**	times greater than the costs
Be considered	**very cost effective**	according to the WHO guidelines (7)

* DALYs averted over a 10 year period

KEY TAKEAWAYS

- Transitioning to MMS leads to significant perinatal health outcomes compared to IFAS with no harm to the mother or baby.
- The transition is very cost-effective compared to the WHO threshold (7) and has a high return on investment – the long-term economic benefits of transitioning outweigh the costs on the order of hundreds of times.

IS ANTENATAL MMS BETTER VALUE FOR MONEY THAN IFAS FOR ETHIOPIA?

The introduction and scale-up of multiple micronutrient supplementation (MMS) as part of maternal nutrition programming is an opportunity to accelerate progress towards several Sustainable Development Goals (SDG) and World Health Assembly (WHA) Global Nutrition Targets 2025. Recent global evidence has concluded that antenatal MMS is superior to iron and folic acid supplementation (IFAS) in improving birth outcomes, and has equivalent benefits for preventing maternal anaemia (1,2,3). New analyses by Nutrition International in collaboration with Limestone Analytics (4) and others (5) have shown that MMS is more cost-effective compared to the existing IFAS programs in low and middle-income countries for achieving positive health outcomes. Given this new evidence, many countries with a high prevalence of nutritional deficiencies among women of reproductive age (WRA) are exploring the feasibility of transitioning from IFAS to MMS for antenatal care (ANC) programmes, within the context of the current World Health Organization (WHO) guidelines (6), but have concerns around the expected additional cost.

The **Nutrition International MMS Cost-Benefit Tool** provides governments with country-specific information about the health benefits and budget impact of adopting MMS and helps to answer the policy question "*is antenatal MMS better value for money than IFAS?*"

The MMS Cost-Benefit Tool provides government policymakers with the opportunity to strengthen their investment case for mobilizing domestic resources and policy considerations around MMS by providing a clear picture of both the financial impacts and health outcomes of the IFAS to MMS transition.

WHAT IS MMS?

One MMS tablet usually contains: Vitamin A (800 µg), Vitamin D (5 µg), Vitamin E (10 mg), Vitamin B1 (1.4 mg), Vitamin B2 (1.4 mg), Vitamin B6 (1.9 mg), Vitamin B12 (2.6 µg), Vitamin C (70 mg), Niacin (18 mg), Folic Acid (400 µg), Zinc (15 mg), Copper (2 mg), Selenium (65 µg), Iodine (150 µg), Iron 30mg (8)

WHAT IS A DALY?

A Disability Adjusted Life Year (DALY) represents one lost year of perfect health. It is calculated by aggregating the effect of a health issue on mortality and morbidity. Interventions seek to avert DALYs.

BACKGROUND

The world is not on track to fully meet the WHA Global Nutrition Targets 2025. Providing women with MMS during pregnancy as part of a comprehensive ANC programme is opportune for accelerating progress towards reducing the risk of low birth weight (LBW), childhood stunting and anaemia in women – helping to move the agenda on women's and maternal health and nutrition.

WHO's ANC guidelines, published in 2016, do not recommend MMS for pregnant women broadly, but do support context-specific MMS for pregnant women when there are populations with high prevalence of micronutrient deficiencies, stating that "*policymakers in populations with a high prevalence of nutritional deficiencies might consider the benefits of MMS to outweigh the disadvantages and may choose to give MMS that include IFA* (6)." Overall, this has contributed to lower levels of adoption and uptake of MMS interventions as part of national health policies, even where the context-specific guidelines would apply. A global task force convened by the New York Academy of Sciences reviewed new evidence and concluded that MMS is both effective and safe and provides greater benefits than IFAS for birth outcomes, smaller than gestational age (SGA) and LBW (1,2,3) and may reduce the risk of stillbirths and neonatal deaths (1,3).

THE MMS COST-BENEFIT TOOL

The results presented in this report are generated from an easy to use, online, knowledge translation tool that analyzes the value for money of transitioning to MMS compared to IFAS. The tool is a practical extension to the recent study conducted by Nutrition International and Limestone Analytics which showed that MMS is more cost-effective than IFAS in three high burden Asian countries (4). Using similar methodology and responding to the new evidence, it compares MMS relative to IFAS using effect sizes from the latest Cochrane (2) or Lancet (3) systematic reviews. The tool has the analytical capacity to estimate the impact of MMS compared to IFAS for all significant health outcomes and calculates the required investment, cost-effectiveness and return on investment based on the total population of pregnant women in the country each year and a defined coverage rate.[1]

[1] Note: Coverage is defined as the proportion of pregnant women in the intervention area who receive 180 supplements.

The tool calculates:

- **Effectiveness:** An aggregate of the number of additional DALYs averted and child deaths by transitioning from IFAS to MMS across the significant health outcomes.
- **Cost:** The additional costs (in USD) to provide MMS if there is an existing IFA program or ANC platform in the country (considers supplement and transition costs).
- **Cost-effectiveness:** The incremental cost-effectiveness ratio. The ratio of the difference in cost and the difference in effectiveness, estimated as the "*cost per additional DALY averted*" by transitioning to MMS.
- **Benefit-cost ratio:** A comparison of the value of the health benefits to the cost of transitioning.

WHAT IS COST-EFFECTIVENESS AND HOW WAS EFFECTIVENESS MEASURED?

The cost-effectiveness of the MMS compared to IFAS is based on a WHO threshold for cost-effectiveness; if the cost per DALY is less than the country Gross Domestic Product per capita the transition is considered 'very cost effective' (7).

The supplements were compared based on their additional effect size (effectiveness) on maternal and newborn health outcomes, taken from the latest Cochrane (2) or Lancet (3) systematic reviews. The health outcomes were aggregated to calculate the additional DALYs averted by transitioning from IFAS to MMS. MMS showed a significant reduced risk of the following health outcomes (3):

- Neonatal mortality (females)
- Stillbirth
- Preterm birth
- SGA
- LBW

WHAT COSTS WERE INCLUDED?

1. Supplement costs (180 supplements to cover six months of pregnancy)
2. Cost of providing the supplement through an existing public health system ANC platform
3. Program costs (national administration, training of health care providers)

WHAT CAN POLICY MAKERS FOCUS ON?

The MMS Cost-Benefit Tool provides an efficient and accessible way to translate evidence to inform the transition from IFAS to MMS, allowing health policymakers to advocate the financial case for implementing MMS.

The output analysis from the tool supports both the domestic and donor level investment case on MMS scale-up, including allocating resources:

- To understand the political and logistical feasibility of adopting MMS
- To assess the factors influencing adoption of MMS and test different delivery platforms with a focus on health system integration.
- To examine the true implementation costs of MMS, including changeover, start-up costs and sustainability of supply.
- To look at mechanisms (i.e. Behaviour Change Interventions, packaging) for improving adherence throughout pregnancy.[2]

Additionally, as part of MMS scale-up, there is an opportunity to improve the measurement and investment of not only the coverage but the quality and uptake of ANC nutrition and health services, including tracking coverage and adherence with MMS and birth outcomes. A comprehensive approach to the transition from IFAS to MMS should include the promotion and support of nutritious diets, including scaled-up counselling on maternal diets at the local level. National governments can leverage this cost-effectiveness analysis to support other areas needed for the transition to MMS, including working through product and supply chain issues with the domestic suppliers to ensure affordable and quality supply of MMS.

Civil society organizations can support countries in MMS adoption and scale-up through technical assistance and operational support to governments and their partners.

The transition and scale-up of MMS presents an opportunity not only to increase progress towards the WHA Global Nutrition Targets 2025 on anaemia and LBW, but also to prioritize women's nutrition as part of national nutrition and health programs and broadly strengthen maternal nutrition.

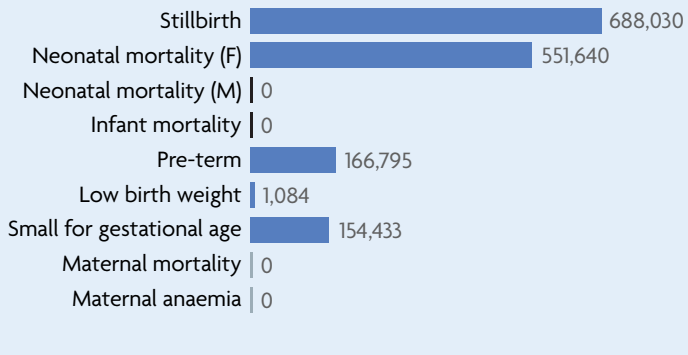
[2] Note: Ideally women should take one MMS tablet per day throughout pregnancy. 180 is aligned with the trials included in the meta-analyses (2,3).

COUNTRY SPECIFIC DATA & ANALYSIS

KEY ASSUMPTIONS FOR ETHIOPIA	VALUE
Population of pregnant women each year (9)	3,901,910
Timespan over which benefits accumulate	10 years
Coverage (proportion of pregnant women reached by supplementation program)	30%
IFAS cost per beneficiary (180 supplements) (10)	$ 2.27 (2016 USD)
MMS cost per beneficiary (180 supplements) (10)	$3.27 (2016 USD)
All other costs associated with transition[3]	$5M (2016 USD)
Source of assumptions about relative risk of various health outcomes*	Cochrane (2) or **Lancet*** (3)

* The Lancet (3) was selected as the source of assumptions for this analysis.

HEALTH OUTCOMES ANALYSIS*



1,561,983
DALYs averted

19,677
child deaths averted

100%
confidence in positive health outcomes

* Prospective health outcomes over a 10 year period

COST EFFECTIVENESS ANALYSIS	
Value of DALYs averted	**$2,563,692,066**
Additional investment over 10 years	**$14,985,225**
Benefit Cost Ratio	**171**
Incremental cost per DALY averted	**$9.59**
According to WHO guidelines	**very cost effective**

[3] Note: A broad estimate of transition costs has been provided based on population size. More information is required to properly estimate these costs.

REFERENCES

1. Bourassa MW, Osendarp SJM, Adu-Afarwuah S, Ahmed S, Ajello C, Bergeron G et al. Review of the evidence regarding the use of antenatal multiple micronutrient supplementation in low- and middle-income countries. *Ann. N.Y. Acad. Sci.* 2019; May 1;1444(1):6-21. Available from: doi.org/10.1111/nyas.14121.
2. Keats EC, Haider BA, Tam E, Bhutta ZA. Multiple-micronutrient supplementation for women during pregnancy. *Cochrane Database of Systematic Reviews*. 2019: Issue 3. Art. No: CD004905. Available from: DOI:10.1002/14651858.CD004905.pub6.
3. Smith, ER, Shankar AH, Wu LS-F, Said A, Seth A-A, Hasmot A, Rina A et al. Modifiers of the effect of maternal multiple micronutrient supplementation on stillbirth, birth outcomes, and infant mortality: a meta-analysis of individual patient data from 17 randomised trials in low-income and middle-income countries. *Lancet Glob. Health*. 2017; 5: e1090–e1100.
4. Kashi B, Godin CM, Kurzawa, ZA, Verney AMJ, Busch-Hallen, JF, De-Regil, LM. Multiple Micronutrient Supplements are more cost-effective than Iron and Folic Acid: Modeling results from 3 high-burden Asian countries. *J Nutrition*. 2019; 149 :1222-1229. Available from: doi.org/10.1093/jn/nxz052.
5. Engle-Stone R., Kumordzie SM, Meinzen-Dick L, Vosti SA. Replacing iron-folic acid with multiple micronutrient supplements among pregnant women in Bangladesh and Burkina Faso: costs, impacts, and cost-effectiveness. *Ann. N.Y. Acad. Sci*. 2019; 1444: 35–51.
6. World Health Organization (WHO). *Recommendations on antenatal care for a positive pregnancy experience*. Geneva: WHO; 2016. Available from: http//apps.who.int/iris/bitstream/10665/250796/1/9789241549912-eng.pdf. [Accessed 7th September 2019].
7. Leech AA, Kim DD, Cohen JT, Neumann PJ. Use and Misuse of Cost-Effectiveness Analysis Thresholds in Low- and Middle-Income Countries: Trends in Cost-per-DALY Studies. *Tufts Medical Center*, 2018; Boston, MA, USA. Available from: doi.org/10.1016/j.jval.2017.12.016.
8. UNICEF, World Health Organization, United Nations University. *Composition of a multi-micronutrient supplement to be used in pilot programmes among pregnant women in developing countries: report of a United Nations Children's Fund (UNICEF), World Health Organization (WHO) and United Nations University workshop*. New York; 1999. Available from: http://apps.who.int/iris/handle/10665/75358. [Accessed 7th September 2019]
9. United Nations, Department of Economic and Social Affairs, Population Division (2019). *World Population Prospects 2019, Online Edition.Rev.1. Total population (both sexes combined) by region, subregion and country, annually for 1950-2100*. (2018 Estimate). Available from: https://population.un.org/wpp/Download/Standard/Population/. [Accessed 7th September 2019].
10. UNICEF. 2018 UNICEF Supply Catalogue. Available from: https://supply.unicef.org/all-materials/pharmaceuticals/minerals-vitamins.html (IFA: Product No. S1550005, MMS: Product No. S1580101). [Accessed 7th September 2019].

ABOUT NUTRITION INTERNATIONAL

Founded in 1992, Nutrition International is a global nutrition organization headquartered in Ottawa, Canada. For 25 years, we have focused on delivering low-cost, high-impact, nutrition interventions to people in need. Working alongside governments as an expert ally, we combine deep technical expertise with a flexible approach, increasing impact without increasing complexity or cost. We serve as a force multiplier across the development ecosystem, using our unique combination of capabilities to help countries overcome barriers to scaling up nutrition, domestic resource mobilization as well as local government capacity and ownership. In more than 60 countries, primarily in Asia and Africa, Nutrition International nourishes people to nourish life. **www.NutritionIntl.org**

Thanks to Limestone Analytics for their support and technical leadership in developing the underlying model and tool.

The MMS Cost-Benefit Tool is available at:
www.NutritionIntl.org/mms-cost-benefit-tool/

For more information, contact MoMS@NutritionIntl.org

NUTRITION INTERNATIONAL
Nourish Life