

A close-up photograph of a smiling woman with dark skin, wearing a vibrant, patterned headwrap in shades of red, orange, and yellow. She is carrying a sleeping baby in a blue and white striped sling. The baby is wrapped in a patterned cloth. The woman is wearing a white top with a purple and green floral pattern. The background is blurred, showing green foliage and a wooden structure.

A Landscape Analysis of Multiple Micronutrient Supplementation Legislation, Activity, and Priorities

February 29, 2020

Table of Contents

List of Tables and Figures	ii
Forward	1
Executive Summary	4
Acronyms	5
Legislation	
Global and Country Status of MMS Legislation	8
History of World Health Organization (WHO) Guidelines for Micronutrient Supplementation	8
Global Database on Implementation of Nutrition Action (GINA)	9
Activities	
Increasing MMS Demand: Global Advocacy Events for MMS (2019-2020)	12
Brief Context of MMS Supply	15
Brief Context of Implementation Science	18
MMS Case Study: Haiti	20
MMS Case Study: Indonesia	22
Priorities	
Landscape of Organizational Work and Commitments to MMS	30
References	48

List of Tables and Figures

Table 1. WHO Recommendations on Micronutrient Supplementation in ANC and PNC	9
Table 2. Sight and Life’s Special Report	19
Table 3. Stakeholder Support Key to Vitamin Angels’ Work in MMS Implementation	22
Table 4. Key Research Trials on Micronutrients in Indonesia	23
Table 5. Case Study Highlights: Several Factors Impacting MMS Implementation	28
Figure 1. Preparation for the N4G Summit is Extensive and Involves Consultation, Commitment Mobilization, and Milestone Events	15
Figure 2. UNIMMAP Formula	15-16
Figure 3. UNIMMAP-MMS Packaging Options, Cost and Environmental Impact	17
Figure 4. Sample Analysis from Nutrition International’s MMS Cost-Benefit Tool	20

Forward

Landscape Analysis Objectives

The goal of this document is to provide information on the global landscape of Multiple Micronutrient Supplementation (MMS) through the lenses of legislation, activity, and priorities. To achieve this objective, we have included information about legislation on the global and national levels, as well as on activities that illustrate the areas of advocacy, supply, and implementation science – though these sections are not intended to be comprehensive.

We acknowledge that advancing the MMS agenda takes work at the global, regional, national, and organizational levels. Thus, we have highlighted two case studies of countries (Haiti and Indonesia) that are moving the MMS agenda forward in different contexts. We conclude this document with MMS priorities - documented as summaries of organizations working in the MMS space and organizations working broadly in maternal and infant nutrition but not specifically in MMS. These organizational summaries aim to share information about MMS programming through the representation of the different strategic approaches and points of view globally.

This Landscape Analysis is part of a larger MMS Stakeholder Consultation aimed at identifying the needs and opportunities to accelerate MMS uptake and use globally, and aligning actions among stakeholders.

MMS Stakeholder Consultation Objectives

The MMS Stakeholder Consultation aims to bring together stakeholders active and potentially active in supporting health systems seeking to introduce and scale MMS interventions for pregnant women. This Consultation will (1) Review the most up-to-date evidence supporting MMS use, policy, and implementation experience; (2) Begin a process of identifying factors impeding and/or enabling use of MMS rooted in supply, demand and delivery; (3) Socialize and identify complementary efforts among stakeholders; and (4) Work to align stakeholders on advocacy for the Nutrition 4 Growth (N4G) Summit and beyond. This consultation will generate greater shared understanding of current MMS activities and priorities, identify gaps that impede use of MMS, and yield stronger advocacy and support for MMS introduction and scaling.

Intended Audience

This document is a pre-read for all individuals attending the February 5 and 6, 2020 MMS Stakeholder Consultation in Washington, D.C. hosted by the Micronutrient Forum (Forum) and sponsored by Kirk Humanitarian. The audience for this publication ranges from individuals who have a comprehensive understanding of the context of MMS to those who are interested in championing MMS, but are not yet aware of its nuances.

Methods

This landscape analysis was conducted in January of 2020 by Maternal & Infant Health Consulting (M&IHC) in collaboration with the Forum and with funding from Kirk Humanitarian. The methods for obtaining information on this topic commenced with a literature scan pertaining to the global MMS landscape. However, it should be noted that this landscape analysis is not exhaustive and there is far more work being executed than is currently published in accessible formats.

The bulk of this research was based on 23 informational interviews conducted in January of 2020. We are grateful to interview participants for being transparent in both sharing details the work that their organizations are executing and planning and recommending information from other organizations.

The preliminary organizations and individuals contacted were 12 Healthy Mothers, Healthy Babies Goalkeepers Accelerator partners (explained in detail below). Additional participants were selected based on snowball sampling. For both individuals and organizations who were referenced by snowball sampling at the end of the research time frame, we requested an organizational summary of their work on MMS. The countries selected for case studies were inspired by snowball sampling, and are not intended to be comprehensive.

Based on the MMS Stakeholder Consultation, this document was updated in February 2020 to include additional organizational summaries. There were also contextual changes to the MMS landscape that occurred in February, which are reflected in this final document.

Methodological Limitations

In an exciting time for MMS implementation, we were not able to successfully schedule interviews with every individual and organization that may have meaningful contributions to make in this field. We acknowledge that several individuals who would have made notable contributions were unable to provide an interview due to personal and professional commitments during the short research window. Several individuals who would have made notable contributions were not contacted for an interview due to the sampling methodology. Greater diversification of national, regional, individual, and organizational work in this space exists that is not contained in this document. There was also information collected that we are unable to share due to privacy concerns.

Acknowledgments

This Landscape Analysis was written in consultation with several subject matter experts in January of 2020. We want to thank those individuals and organizations who have contributed and validated information.

Organizations who contributed by sharing and approving an organizational summary of their work in MMS include: *1,000 Days*, *Asia Philanthropy Circle (APC)*, *Bill & Melinda Gates Foundation (BMGF)*, *Children's Investment Fund Foundation (CIFF)*, *DSM*, *Emergency Nutrition Network (ENN)*, *The Eleanor Crook Foundation (ECF)*, *Family Larsson-Rosenquist Foundation (FLRF)*, *Global Affairs Canada (GAC)*, *The Global Alliance for Improved Nutrition (GAIN)*, *GMMB*, *Harvard T.H. Chan School of Public Health (Harvard)*, *Helen Keller International (Helen Keller)*, *Johns Hopkins University (JHU)*, *Kirk Humanitarian*, *Micronutrient Forum (Forum)*, *The New York Academy of Sciences (NYAS)*, *Nutrition International (NI)*, *Power of Nutrition*, *Republic of the Union of Myanmar*, *Sight and Life*, *Summit Institute of Development (SID)*, *UNICEF*, *USAID*, *Vitamin Angels (VA)*, *The World Bank*, *World Food Programme (WFP)*, and *World Vision*

We want to extend a special thanks to those individuals who have generously provided insights in the form of informational interviews: *Clayton Ajello, DrPH, MPH (VA)*, *Madhavika Bajoria, MPA (Sight and Life)*, *Robert Black, MD, MPH (JHU)*, *Megan Bourassa, PhD (NYAS)*, *Jennifer Busch-Hallen, MPH (NI)*, *Parul Christian, DrPH, MSc (JHU)*, *Nicki Connell, MSc (ECF)*, *Nita Dalmiya, MPH (UNICEF)*, *Carmel Dolan (ENN)*, *Yannick Foing (DSM)*, *Sarah Gibson, MSc (CIFF)*, *Maria Margarida Guerra, MPH, MA (CIFF)*, *Quinn Harvey, MA (Vitamin Angels)*, *Dr. Lwin Mar Hlaing, M.B., MPH, PhD (Republic of the Union of Myanmar)*, *Kristen Hurley, PhD MPH (VA)*, *Klaus Kraemer, PhD (Sight and Life)*, *Spencer Kirk (Kirk Humanitarian)*, *Katharina Lichtner, PhD (FLRF)*, *Marie McGrath (ENN)*, *Kathryn Reider, MS (World Vision)*, *Dr. Anuraj Shankar (SID/CTMGH)*, *Jeremy Shoham (ENN)*, *Lara Steinhouse, MSc (GAC)*, *Alison Tumilowicz, PhD, MPH, RD (BMGF)*, and *Keith West, DrPH (JHU)*



Executive Summary

Executive Summary

Undernutrition is estimated to be responsible for nearly half of all deaths in children under age five, contributes to higher rates of maternal mortality, and decreases productivity and economic outputs in low- and middle-income countries (LMIC). Maternal micronutrient deficiency is one form of malnutrition, which perpetuates the cycle of malnutrition, contributing to poor birth outcomes and negatively impacting infant health. While Iron and Folic Acid (IFA) supplementation is a standard component of antenatal care (ANC) in LMICs to help address micronutrient deficiencies, MMS is demonstrated to have far greater benefits on pregnancy outcomes.

The current WHO recommendation for standard of care for ANC, which was last updated in 2016, is IFA supplementation alone. WHO does not recommend MMS for pregnant women; however, the guideline suggests that in populations with a high prevalence of nutritional, including micronutrient, deficiencies, policymakers may consider whether the benefits of MMS outweigh potential risks. In populations affected by an emergency, WHO recommends MMS for pregnant and lactating women until the emergency ends and access to nutrient rich foods is restored. WHO provides a Global Database on Implementation of Nutrition Action (GINA) which documents country policies, programs, and actions related to national nutrition efforts. A systematic review found that nineteen countries mentioned MMS in their national nutrition policies, including seven country policies that specifically mention MMS.

In a 1999 technical workshop, WHO, UNICEF, and the United Nations University designed a comprehensive MMS formulation consisting of 13-15 micronutrients including IFA—termed the United Nations International Multiple Micronutrient Antenatal Preparation (UNIMMAP). There is currently insufficient supply of UNIMMAP-MMS tablets for several reasons, including low public-sector demand (which can be attributed in part to the lack of a robust recommendation for its use by WHO), few manufacturers producing the product, and fluctuations in healthcare funding.

With current initiatives creating momentum and energy around the issue, demand is expected to increase significantly in the next several years. This landscape analysis outlines five global advocacy events working to increase MMS demand: Women Deliver 2019; Asian Congress of Nutrition 2019; Goalkeepers Accelerator 2019; Micronutrient Forum 5th Global Conference 2020; and N4G.

In order to optimize delivery for MMS, implementation research is needed that generates the operational knowledge and documented experiences to ensure high MMS program coverage, adherence, and fidelity at the beneficiary level. This report details ongoing research on MMS implementation science, including the implementation research priorities developed by the MMS Technical Advisory Group (MMS TAG) in 2019, a customizable cost-benefit analysis tool comparing the cost of MMS to IFA supplementation, and results from implementation research in two countries, Haiti and Indonesia.

Many organizations are working to improve access and uptake of MMS for pregnant women by working at global and national levels to address MMS supply, demand, and delivery. The *Healthy Mothers, Healthy Babies Accelerator* is a coordinated initiative led by the Forum and composed of 12 partners to advance the introduction and implementation of MMS over the next three years. The Accelerator leverages new investments from the private sector, philanthropies, non-governmental organizations (NGOs), and country leadership to save lives and improve the health of millions of women and newborns, address inequity in access to MMS, and make progress toward the Sustainable Development Goals (SDGs).

Acronyms

• ACN	Asian Congress of Nutrition
• ANC	Antenatal Care
• ANCS	Adaptive Networks for Care at Scale
• APC	Asia Philanthropy Circle
• ASEAN	The Association of Southeast Asian Nations
• BISA	Better Investment for Stunting Alleviation
• BMGF	Bill & Melinda Gates Foundation
• CF	Community Facilitator
• CHNRI	Child Health and Nutrition Research Initiative
• CHW	Community Health Worker
• CIFF	Children's Investment Fund Foundation
• CotD	Cost of the Diet
• DALY	Disability-Adjusted Life Year
• DFID	The Department for International Development
• DHS	Demographic and Health Survey
• ECF	The Eleanor Crook Foundation
• EML	The WHO Model List of Essential Medicines
• ENN	Emergency Nutrition Network
• FIAP	Feminist International Assistance Policy
• FLRF	Family Larsson-Rosenquist Foundation
• FNG	Fill the Nutrient Gap
• GAC	Global Affairs Canada
• GAIN	The Global Alliance for Improved Nutrition
• GDG	Guideline Development Group
• GFF	Global Financing Facility
• GINA	Global Database on Implementation of Nutrition Action
• IAEA	International Atomic Energy Agency
• IAS	Indonesian Academy of Sciences
• IFA	Iron and Folic Acid
• IFAS	Iron and Folic Acid Supplementation
• INGO	International non-governmental organizations
• INI	Indonesian Nutrition Institute
• IYCF	Infant and young child feeding
• JHU	Johns Hopkins University
• LBW	Low birth weight
• LMIC	Low- and Middle- Income Countries
• M&IHC	Maternal & Infant Health Consulting
• MCSP	Maternal and Child Survival Program
• MDG	Millennium Development Goals
• MITRA	Micronutrient Supplementation for Reducing Mortality and Morbidity in Indonesia
• MMN	Multiple Micronutrient
• MMS	Multiple Micronutrient Supplementation
• MMS TAG	Multiple Micronutrient Supplementation Technical Advisory Group
• MNCH	Maternal, Neonatal, and Child Health
• MNP	Multiple Micronutrient Powders
• MOH	Ministry of Health
• MOHS	Ministry of Health and Sports (the Republic of the Union of Myanmar)
• MSP	Ministry of Public Health (Dominican Republic)
• MSPP	Haitian Ministry of Public Health and Population/Ministère de la Santé Publique et de la Population
• N4G	Nutrition for Growth
• NGO	Non-governmental organizations
• NI	Nutrition International
• NYAS	New York Academy of Sciences
• OMNI	Outcome Modeling for Nutrition Impact
• OpenSRP	Open Smart Register Platform
• PAHO	Pan American Health Organization
• PESTLHE	Political, economic, social, technological, legal, health and environmental factors
• PLW	Pregnant and Lactating Women
• PNC	Postnatal Care

● RCT	Randomized Control Trial
● RMNCH	Reproductive, maternal, neonatal and child health
● RNI	Recommended Nutrient Intake
● SAL	Sight and Life
● SBCC	Social and behavior change communication
● SDGs	Sustainable Development Goals
● SID	SUMMIT Institute of Development
● SUMMIT	Supplementation with Multiple Micronutrients Intervention Trial
● SUN	Scaling Up Nutrition
● THRIVE	Technologies for Health Registers, Information, and Vital Events
● UHC	Universal Health Coverage
● UN	United Nations
● UNAIDS	United Nations Programme on HIV/AIDS
● UNDP	United Nations Development Programme
● UNFPA	United Nations Population Fund
● UNICEF	United Nations Children's Fund
● UNIMMAP	United Nations International Multiple Micronutrient Antenatal Preparation
● USAID	United States Agency for International Development
● USP	United States Pharmacopeia
● VA	Vitamin Angels
● WFP	World Food Programme
● WHA	World Health Assembly
● WHO	World Health Organization
● WIFAS	Weekly Iron Folic Acid Supplementation

Legislation



Legislation

Global and Country Status of MMS Legislation

History of World Health Organization (WHO) Guidelines for Micronutrient Supplementation

Among other population level nutrition and health interventions, WHO has recommended IFA supplementation as the standard of care for pregnant women to combat anemia and iron deficiency since 1968. In 1999, WHO, UNICEF, and the United Nations University held a technical workshop to specifically address widespread micronutrient deficiencies and high rates of anemia among pregnant women globally. The collaborators designed a comprehensive MMS formulation to meet women's increased nutritional demands during pregnancy that consisted of 13-15 micronutrients including IFA—UNIMMAP. This MMS formulation was subsequently tested for its effectiveness on maternal and neonatal outcomes in several trials in LMIC.

In 2007, WHO released a joint statement with WFP and UNICEF on "Preventing and Controlling Micronutrient Deficiencies in Populations Affected by an Emergency."¹ This guideline states that pregnant and lactating women should be given a daily multiple micronutrient (MMN) supplement during emergencies, whether they receive fortified rations or not. Additionally, "The MMN supplements should be given until the emergency is over and access to nutrient rich foods is restored. At this time, the micronutrient status of the population should be assessed to decide whether further interventions to prevent and control micronutrient deficiencies are needed." Further, "It is recommended that Vitamin A supplements should continue to be given to mothers postpartum according to existing recommendations. Iron and folic acid supplements, when already provided, should be continued."

Based on continued emerging evidence, in 2012 WHO published updated recommendations: "Guideline: Daily Iron and Folic Acid Supplementation in Pregnant Women." This guideline served as a public health measure to improve pregnancy outcomes in support of the WHO's efforts to achieve the Millennium Development Goals (MDG)—in particular, reduction of child mortality (MDG 4) and improvement in maternal health (MDG 5).² This document indicated, "Daily oral iron and folic acid supplementation (consisting of 30–60 mg of elemental iron and 400 µg / 0.4 mg folic acid) is recommended as part of antenatal care to reduce the risk of low birth weight, maternal anemia and iron deficiency."

The recommendation was informed by a 2009 Cochrane systematic review³ that examined the benefits and harms of iron supplementation in pregnant women, including 60 randomized controlled trials with 27,402 women from 30 different countries in all continents. Analysis compared daily iron supplements alone, folic acid alone, iron in combination with folic acid, iron in combination with other micronutrients, and placebo. The newborn outcomes analyzed were low birth weight, weight at birth, prematurity, perinatal death, and congenital anomalies (including neural tube defects). The maternal outcomes measured included anemia status, iron deficiency, iron deficiency anemia at term, supplement side effects, clinical malaria, and infections during pregnancy.

In 2016, a guideline review group including the Department of Nutrition for Health and Development at WHO headquarters in Geneva, along with its internal partners, convened to review further micronutrient supplementation evidence, following the formal WHO handbook for guideline development procedures. Subsequently, WHO guidelines were published, which continue to advise IFA to be a part of the quality services of routine ANC and postnatal care (PNC) throughout pregnancy to reduce the risk of low birth weight, maternal anemia, and iron deficiency.

Table 1. WHO Recommendations on Micronutrient Supplementation in ANC and PNC

WHO Recommendations on Micronutrient Supplementation in Antenatal Care and Postnatal Care

- WHO Recommendations on Postnatal Care of the Mother and Newborn⁴ (2013)
 - “IFA supplementation should be provided for at least three months postpartum.”
- WHO Recommendations on Antenatal Care for a Positive Pregnancy Experience⁵ (2016)
 - “Daily oral IFA supplementation with 30 mg to 60 mg of elemental iron and 400 µg (0.4 mg) of folic acid is recommended for pregnant women to prevent maternal anemia, puerperal sepsis, low birth weight, and preterm birth.”
 - “Intermittent oral IFA supplementation with 120 mg of elemental iron and 2,800 µg (2.8 mg) of folic acid once weekly is recommended for pregnant women to improve maternal and neonatal outcomes if daily iron is not acceptable due to side effects, and in populations with an anemia prevalence among pregnant women of less than 20%.”
 - “In populations with low dietary calcium intake, daily calcium supplementation (1.5–2.0 g oral elemental calcium) is recommended for pregnant women to reduce the risk of pre-eclampsia.”
 - “Vitamin A supplementation is only recommended for pregnant women in areas where vitamin A deficiency is a severe public health problem, in order to prevent night blindness.”
 - “Zinc supplementation for pregnant women is only recommended in the context of rigorous research.”
 - “MMS is not recommended for pregnant women to improve maternal and perinatal outcomes. There is some evidence of additional benefit, but there is also some evidence of risk, and there are some important gaps in evidence.”
 - “Although the Guideline Development Group (GDG) agreed that overall there was insufficient evidence to warrant a recommendation, the group agreed that policymakers in populations with a high prevalence of nutritional deficiencies might consider the benefits of MMN supplements on maternal health to outweigh the disadvantages, and may choose to give MMN supplements that include iron and folic acid.”
 - “The evidence for these recommendations was largely derived from a 2015 Cochrane review⁶ in which data from 14 trials in LMIC compared MMS for pregnant women with IFA supplementation only. Ultimately, the advisory group stated that more research was needed to determine which micronutrients improve maternal and perinatal outcomes, and how these can be optimally combined into a single supplement.”

Global Database on Implementation of Nutrition Action (GINA)⁷

WHO’s GINA tool was launched in 2012 and is accessible through the [WHO website](#). GINA provides information on the implementation of numerous nutrition policies and interventions, collected from a variety of sources, and invites GINA users to submit their data directly. Users can share information on how programs are implemented, including country adaptations and lessons learned.

The complete list of published policies in GINA by country currently includes 2,333 policies in 201 countries; at the time of download, it had last been updated on January 9, 2020. Annex Table: Policies Including Recommendations and/or Action Items on Micronutrient Supplementation was created based on policies that were filtered using two methods: inclusion of policies with the words “micronutrient”, “multiple micronutrient”, “MMS”, or “MMN” listed as a topic, and inclusion of policies that were active in the year 2015 or later.

Using GINA’s provided links to access the policies, specific references to MMS for pregnant women were identified. The policies that had direct references to MMS or IFA supplementation were extracted and are presented in the Annex Table: Policies Including Recommendations and/or Action Items on Micronutrient Supplementation. Five policies referenced micronutrients, but did not specify any specific type of micronutrient intervention; these policies were extracted, labeled as “Unspecified Micronutrient Supplementation”, and included in the same column as MMS. Policies that directly referenced specific micronutrients *other* than IFA or MMS (e.g., Vitamin A) were excluded completely. Policies written in Spanish, French, and Portuguese were assessed using a combination of the researchers’ knowledge and GoogleTranslate.

GINA also identifies countries that have indicated that they have or are taking action relating to micronutrients via the Global National Policy Review 2016-2017. These programs were excluded from the table because GINA does not provide extra

information on what the programs or actions are. These countries are: Belize, Bolivia, Canada, Dominican Republic, Haiti, Mexico, and Saint Lucia.

While GINA is a valuable resource for obtaining an overview of the global landscape of nutrition programs and policies, several limitations of the findings should be noted:

- GINA may not include a country's most recent published policies.
- There are many blank fields in GINA. For the purposes of this table, policies with missing values for the "adopted", the "start_year", and the "end_year" columns have been excluded.
- Some policies have been misclassified with "micronutrient" as a policy topic, but the policy does not reference a micronutrient, or the policy uses a background section to describe the micronutrient deficiencies as a health issue in their country, but the policy does not include micronutrient supplementation in its strategies.
- Some policies are in languages difficult for the research team to translate and were thus excluded in this report. They may be included in future reports. These languages include: Russian, Czech, and Arabic.
- GINA does not provide reference documents to some policies; if these policies could not be found using the country's government website, they were excluded.

Based on the review criteria, a total of 21 policies were included in the table: nine policies on IFA only (Bangladesh, Belize, China, Ethiopia, Guinea-Bissau, Maldives, Mauritania, Panama, Rwanda), two policies on MMS only (Mongolia, Mozambique), three policies on both IFA and MMS (Cambodia, Cameroon, Madagascar), five policies on Unspecified Micronutrient Supplementation (Gambia, Kenya, Morocco, Nepal, Nicaragua) and two WHO policies regarding micronutrient supplementation during pregnancy.



Activities



Activities

Increasing MMS Demand: Global Advocacy Events for MMS (2019-2020)

For the context of this landscape analysis, MMS demand is defined as global, regional, and national support to offer clear guidance on all aspects of the intervention, including; (a) Normative recommendations, (b) Policy change, and (c) Regulatory support. Creating demand for MMS is currently being done through organizing and convening global or regional advocacy events at highly recognized international and national meetings.

Global advocacy events on MMS in 2019 and 2020 include:

- Women Deliver 2019
- Asian Congress of Nutrition 2019
- Goalkeepers Accelerator 2019 with BMGF
- Micronutrient Forum 5th Global Conference 2020
- N4G 2020

Women Deliver 2019

June 3-6, 2019

The Women Deliver 2019 Conference was held June 3-6, 2019 in Vancouver, Canada. With more than 6,000 attendees, including leaders, advocates, academics, activists, and journalists, it was one of the world's largest conferences on "gender equality and the health, rights, and wellbeing of girls and women in the 21st century."⁸ The theme of the conference was power, which was examined through the lens of the individual's power, structural power, and the power of movements.

Sight and Life, VA, CIFF, 1,000 Days, and Kirk Humanitarian hosted "Power for Mothers: Bringing a Ready Solution for Better Nutrition to All". Moderated by Kristin Hurley, Program Director at VA and Associate Professor at JHU, this event featured a discussion on MMS with Robert Black of JHU, Spencer Kirk of Kirk Humanitarian, Lenore Spies from the KwaZulu-Natal Department of Health, Klaus Kraemer of SAL, and representatives from 1,000 Days, Bill & Melinda Gates Foundation (BMGF) and CIFF. The conversation focused on how global recommendations need to be updated to reflect current science demonstrating that taking MMS during pregnancy improves maternal and infant health, and how closing the maternal nutrition gap supports gender equality.⁹ As a direct consequence of this meeting at Women Deliver, the November 2019 MMS Technical Consultation on MMS product specification was co-organized by NYAS and the Forum.

Asian Congress of Nutrition 2019

August 4-7, 2019

The Asian Congress of Nutrition (ACN) was held in Bali from August 4-7, 2019. Hosted by the Food and Nutrition Society of Indonesia and the Federation of Asian Nutrition Societies, the theme of the conference was "Nutrition and Food Innovation for Sustained Well-Being", with the goal "to promote nutrition and food innovation and to encourage scientific interchange among food, nutrition and health researchers and professionals in Asia and worldwide."¹⁰ MMS was represented in oral presentations and posters throughout the conference.

The following oral presentations at the conference focused on MMS and/or micronutrient deficiencies during preconception, pregnancy, and lactation:

- Abdul Salam (Hasannuddin University, Bogor Agricultural University, Indonesia). "The Effect of Vitamin A Supplementation Given Shortly After Giving Birth and At 6 Weeks After On Breast Milk Retinol Levels and Infant Morbidity"
- Lucy Widasari (UPN Veteran Jakarta University, Indonesia). "Effects of Multimicronutrient and IFA Supplementation In Preconception Period Against VEGF/Sflt-1 Ratio and Birth Weight: A randomized, Double-Blind Controlled Trial in Banggai Regency, Central Sulawesi"¹¹
- VA, Hasanuddin University, and Airlangga University. "Update on Evidence, Policy, and Practice: Multiple Micronutrient Supplementation (MMS) for Pregnant Women"

The following posters presented at the conference focused on MMS:

- Lucy Widasari, Maisuri T Chalid, Nurhaedar Jafar, Abdul Razak Thaha & Frima Elda. Indonesia. “Comparison Compliance Score Between IFA and Multimicronutrient Supplementation Since Preconception Period with Ultrasound Findings and Birth Length in Banggai Regency, Central Sulawesi”
- Alina Hizni, Sholichin & Dwi Juwita. Indonesia. “Mother’s Milk Supplementary Food Based on Rice Flour (*Oryza Sativa*), Teri Fish (*Stolephorus Sp*) and Tempe Kedlai (*Rhizopus Oligosporus*)”
- Li Minmin. China. “Study on the Association of Iron Supplementation and Adverse Birth Outcomes in Northwestern China”¹²

Goalkeepers Accelerator 2019 with the Bill & Melinda Gates Foundation

September 24-25, 2019

In September 2019, the BMGF hosted Goalkeepers 2019, an annual event that brings partners together around a common goal to catalyze action. At the Goalkeepers 2019 event, the *Healthy Mothers, Healthy Babies* Accelerator was launched – a coordinated initiative led by the Forum – to advance the introduction and implementation of MMS over the next three years.

The Accelerator leverages new investments from the private sector, philanthropies, NGOs, and country leadership to save lives and improve the health of millions of women and newborns, address inequity in access to MMS, and make progress toward the SDGs.

The Accelerator lists 12 partners, including the Forum (the tentpole partner of the Accelerator), CIFF, DSM, ECF, HaloDoc in Indonesia, Kirk, Nutrition International (NI), NYAS, Republic of the Union of Myanmar, Sight and Life, UNICEF, and VA. Their commitments, organized around the three pillars of demand, supply and delivery, include funding and investment development, technical support, market shaping, manufacturing, distribution, and implementation. The *Healthy Mothers, Healthy Babies* Accelerator brings an enormous amount of energy and investment to MMS, and will improve the health of millions of women and infants over the next three years. Initial commitments, as presented during the launch event in September, included close to \$50M USD in financial and in-kind investments providing at least 17.5 million pregnant women with MMS.

Event-related progress to date includes:

- In November 2019, (1) a panel discussion with representatives from Myanmar at the Scaling up Nutrition (SUN) Global Gathering, (2) a technical consultation on MMS Product Specification hosted by the Forum and NYAS in Washington, DC, and (3) a brief concept-note on the costs and cost-effectiveness of MMS by the Forum and NYAS for the WHO Antenatal Care Guideline Revision.
- The MMS Stakeholder Alignment Consultation in February 2020 in Washington, DC, and events and activities at the Micronutrient Forum 5th Global Conference in Thailand, which are outlined below.¹³

Micronutrient Forum 5th Global Conference 2020

Postponed as of February 24th, 2020

Originally Scheduled for March 23-27, 2020

The Micronutrient Forum 5th Global Conference was originally scheduled to take place March 23-27, 2020 in Bangkok, Thailand. More than 1,000 researchers, program implementers and policymakers were expected to attend the conference to explore the theme “Building New Evidence and Alliances for Improving Nutrition”. When rescheduled, the conference will highlight research (related to biology, efficacy, safety, and effectiveness), implementation, and policy/enabling environment work related to micronutrients. In addition, the conference will take a deep dive into how micronutrients might be optimized and protected within food systems. Goals include driving greater participation from the agriculture, manufacturing, processing and distribution, and retail and culinary sectors to widen the conversation and increase multi- sectoral innovation on sustainable solutions.

Conference topics include:

- The delivery of large-scale nutrition-specific interventions, including supplementation, fortification, and biofortification.
- Addressing data gaps and issues with current estimates of micronutrient malnutrition as well as how new techniques and software can help to routinely collect information on micronutrient intakes and biomarkers in large scale surveys.
- The challenges and opportunities for addressing the double burden of malnutrition (micronutrient nutrition, obesity) and noncommunicable diseases.

- How micronutrients might be optimized and protected within food systems, as well as the interactions between agriculture and climate change, and their impact on health and nutrition.¹⁴

As part of the official conference activities, a spotlight will be cast on MMS through two events, including: i) a session by experts (including Dr. Chris Sudfeld, Dr. Gilles Bergeron, and Dr. Reina Engle-Stone) in which the latest evidence and the decision-making process around the adoption of MMS will be presented; and ii) a MMS plenary session to provide an update on the *Healthy Mothers, Healthy Babies* Accelerator. Beyond these conference events, there are opportunities to position MMS more prominently through additional activities and events including:

- At the Welcome Event and Reception bring attention to and build interest for MMS activities at the conference, and describe the importance of MMS.
- Two separate sponsored MMS symposium sessions based on the *Sight and Life MMS Special Report* to: (1) summarize MMS evidence and the policy landscape, (2) present findings from MMS implementation projects, (3) publicize MMS related events and activities at the conference, and (iv) showcase MMS tools and resources.
- An MMS networking lunch to encourage engagement from conference delegates interested in advancing MMS policy.
- An MMS “ask the experts” learning session for more in-depth, one-on-one discussions for conference participants to take a deeper dive into MMS-related topics.
- A *Healthy Mothers, Healthy Babies* Accelerator lunch plenary with presentations that may include updates on Accelerator commitments, next steps, announcements of new donor commitments, and discussion of the synchronicity of Accelerator commitments to drive progress, calls to action to address gaps and needs, provide an update from donor consultation meetings, and the latest implementation research and its impact on country decision making.¹⁵

Nutrition for Growth (N4G) 2020

Postponement under review

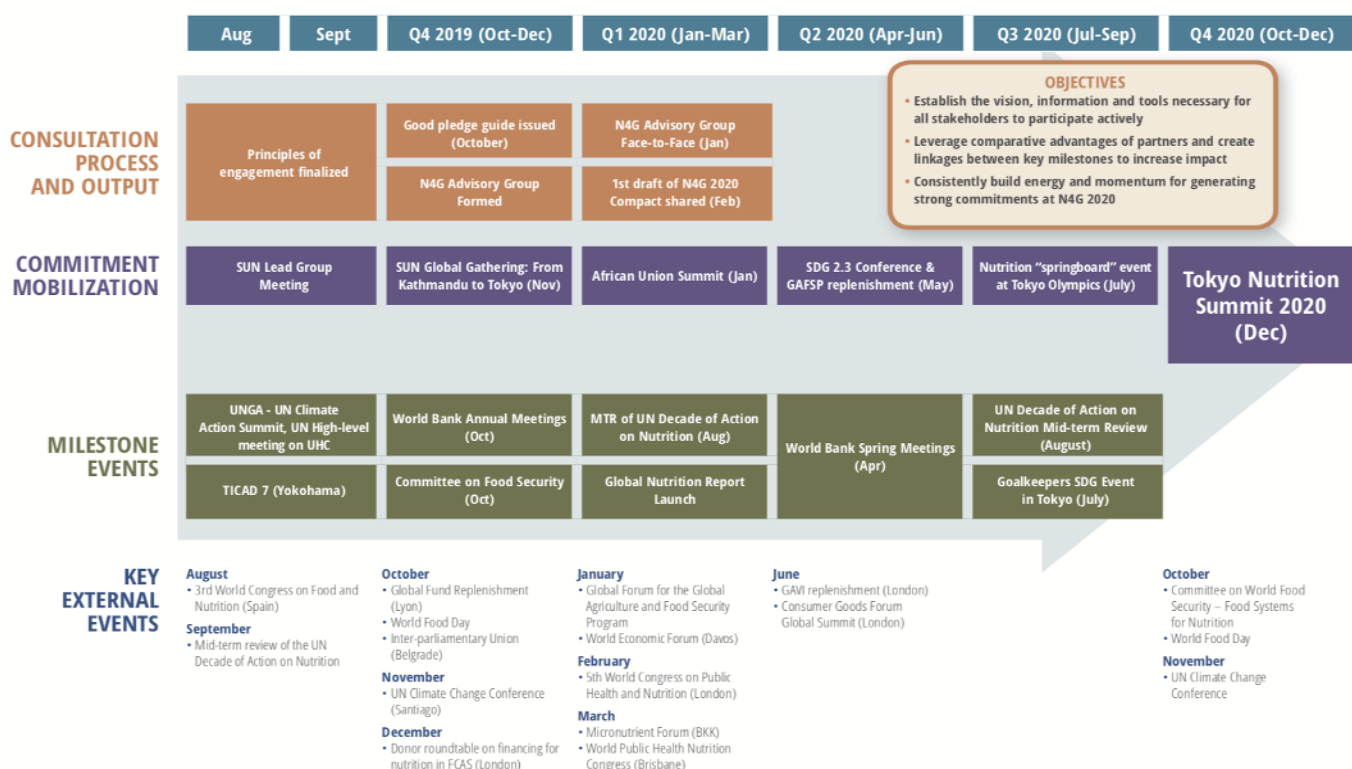
Currently scheduled for December 2020

The Tokyo N4G Summit is scheduled for December 2020, coinciding with the halfway point of the UN’s Decade of Action on Nutrition. The Summit’s vision is to maintain momentum in achieving SDGs, deliver on unfinished goals with the recognition of new challenges such as climate change, coordinate sectors and stakeholders to reach targets such as ending malnutrition in all its forms by 2030. The Summit will ask the global community to commit to three areas:

1. Health: Making nutrition integral to UHC for sustainable development.
2. Food: Building food systems that promote safe, healthy diets and nutrition, ensure livelihoods of producers, and are climate-smart.
3. Resilience: Address malnutrition effectively in fragile and conflict-affected contexts.¹⁶

Figure 1. Preparation for the N4G Summit is Extensive and Involves Consultation, Commitment Mobilization, and Milestone Events

TOKYO NUTRITION SUMMIT 2020 — ROADMAP



Source: Tokyo Nutrition for Growth Summit 2020. Vision and Roadmap. August 2019.

Brief Context of MMS Supply

Definition

For this landscape analysis, MMS supply is defined as high quality, reliable supply manufactured based on the open-access UNIMMAP-MMS product specifications designed to be adapted to any globally recognized regulatory and quality standards as defined in the specifications document.¹⁷ The goal of the open access product specification is to ensure a standardized and affordable global supply of MMS product that meets international quality standards.

United Nations International Multiple Micronutrient Antenatal Preparation (UNIMMAP)

UNIMMAP is the recommended formula by the MMS Task Force, developed in 1999 during a workshop of the WHO, UNICEF, and the United Nations University.¹⁸ A consensus open-access UNIMMAP-MMS product specification was recently achieved at a November 2019 technical consultation hosted by the Forum and NYAS. The Product Specification for UNIMMAP-MMS is open-access to make UNIMMAP-MMS an affordable product consistent with international quality standards. UNIMMAP-MMS tablets are based on the UNIMMAP formulation, come packaged in 180 count bottles, and can be available at cost parity with IFA tablets.¹⁷ Recent information from Clayton Ajello, Technical Subject Matter Expert, indicates that UNIMMAP-MMS tablets also have at least a 30-month shelf life. UNICEF provided MMS product is currently available in bottles of 100 or 1,000 tablets. However, there is currently insufficient supply of UNIMMAP-MMS tablets for several reasons, including low public-sector demand (in part due to a lack of a robust recommendation for its use by WHO), limited production (given only a few manufacturers are producing the product), and fluctuations in healthcare funding. Nevertheless, product demand outstrips existing supply and as demand builds, the challenges to product availability are likely to abate.¹⁹

Figure 2. UNIMMAP -MMS Formula, Courtesy of New York Academy of Sciences¹⁷

Component	Chemical Entity*	Amount
Vitamin A	Retinyl Acetate	800 mcg RAE
Vitamin C	Ascorbic Acid	70 mg
Vitamin D	Cholecalciferol	5 mcg (200 IU)

Vitamin E	Alpha Tocopheryl Succinate	10 mg a-TE
Vitamin B1	Thiamine Mononitrate	1.4 mg
Vitamin B2	Riboflavin	1.4 mg
Vitamin B3	Niacinamide	18 mg NE
Vitamin B6	Pyridoxine HCl	1.9 mg
Folic Acid	Folic Acid	680 mcg DFE (400 mcg)
Vitamin B12	Cyanocobalamin	2.6 mcg
Iron	Ferrous Fumarate	30 mg
Iodine	Potassium Iodide	150 mg
Zinc	Zinc Oxide	15 mg
Selenium	Sodium Selenite	65 mg
Copper	Cupric Oxide	2 mg

*These chemical entities may be replaced by other chemical entities if they demonstrate equal or better performance (e.g., stability).

Costs and Manufacturing

The benchmark price for UNIMMAP-MMS is \$0.01 per tablet, which would put it on par with the cost for IFA supplements. Currently, UNICEF's MMS product is twice the price of IFA supplements, largely due to low volume purchases and administrative costs.¹⁸ To reach the benchmark price point, purchases from a single manufacturer needs to reach 3-5 million 180 count bottles of UNIMMAP-MMS product production per year.¹⁷ Recent information from Clayton Ajello, Technical Subject Matter Expert, indicates that the current available global supply of MMS is 5.5–6 million 180 count bottles – sufficient to support the same number of pregnant women per year, but the need for MMS in LMIC alone is 197 million pregnancies per year. With current initiatives creating momentum and energy around the issue, demand will at least double over the next several years. Already, demand equals or surpasses available global supply.¹⁸

There are currently only two or three manufacturers of UNIMMAP-MMS that meet high-quality standards set in the open-access UNIMMAP-MMS product specifications. Kirk Humanitarian and VA are major suppliers of UNIMMAP-MMS and source from Contract Pharmacal Corp (CPC); and UNICEF, another supplier of UNIMMAP-MMS, sources from two suppliers. Each of these agencies procure supplements in compliance with the open-access UNIMMAP-MMS product specifications. Kirk Humanitarian and VA procure product that has been verified by the USP, and is consistent with the *Oil-and-Water Soluble Vitamins with Minerals* monograph.¹⁹ More manufacturers are needed to fill rising demand, and the process to start manufacturing at a new facility can require material lead time. DSM has designed a standardized pre-mix of MMS that should enable manufacturers to shorten the lead time to manufacturing start up and still produce a safe, high-quality UNIMMAP-MMS product consistent with the open-access UNIMMAP-MMS product specification. DSM is developing MMS manufacturing capabilities (stability study ongoing) in both USA and South Africa, to make use of its global footprint.



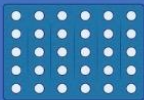

UNIMMAP-MMS is a “custom” product that needs a longer lead time for new manufacturers to produce initially because of the need to undertake product development, test manufacturing, and stability testing. The open-access product specification is intended to help lower initial development costs and time to regularized production. Where a single domestic market seeks to have a local supplier/manufacturer, MMS should be produced by “qualified” manufacturers. Qualified manufacturers should: (1) possess tablet or capsule manufacturing experience; (2) manufacture to internationally recognized quality standards; and (3) manufacture consistent with the open-access UNIMMAP-MMS product specification.¹⁸ For first time manufacturers, purchasers should utilize an independently operated verification program to ensure quality.¹⁷

The effect of a lack of manufacturers is shown in a 2018 situation analysis of MMS procurement and production in 12 lower and upper middle-income countries. Despite the availability of MMS, none of the surveyed countries had a product adhering to the UNIMMAP-MMS formulation.²⁰


Packaging

Packaging of UNIMMAP-MMS should consider cost, environmental implications, and whether packaging has an effect on patient compliance, and/or whether it improves compliance with the recommended antenatal care visit schedule.¹⁹ Currently, the MMS Task Force, a group of experts in nutrition, public health, economics and statistics convened by NYAS and BMGF, suggests using high-density polyethylene bottles with 180-count bottles and use beginning as early in pregnancy as possible.¹⁸

Figure 3. UNIMMAP-MMS Packaging Options, Cost and Environmental Impact, Courtesy of Kirk Humanitarian

UNIMMAP MULTIPLE MICRONUTRIENT SUPPLEMENTS (MMS) FOR PREGNANT WOMEN PACKAGING OPTIONS, COST AND ENVIRONMENTAL IMPACT				
	 180 Count	 30 Count	 30 Count	 Bulk ¹
PACKAGING FEATURES	Child-resistant cap and tamper evident seal HDPE bottle	Child-resistant and tamper-proof HDPE bottle	Child-resistant and tamper-proof Aclar film with foil	No child-resistant or tamper-proof features
PRODUCT COST Per tablet ^{2, 3}	1.1 cents Palletization costs an added .05 cents per bottle.	2 cents Palletization costs an added .01 cent per bottle.	1.7 cents Palletization costs an added .01 cent per card.	0.9 cents Repackaging costs are variable.
ENVIRONMENTAL IMPLICATIONS Per million women (180 doses each) ⁴	Total waste: 22,900 kg	Total waste: 98,400 kg	Total waste⁵: 38,856 kg	Total waste⁶: Variable
AVAILABILITY	Available now. Approved in the U.S. and commercially available now.	Not currently available. Each variation to the core UNIMMAP MMS product (180-count bottle) is considered a "custom" product that will require new stability studies and significant manufacturing preparation to make that will vary by country regulatory requirements. Variations from currently available units are estimated to take at least 18-24 months until obtainable for commercial use.		

COURTESY OF



KIRK
HUMANITARIAN

¹ MMS shipped in bulk requires repackaging before dissemination (business-to-business (B2B) option).
² Prices are based on high-volume production. Product cost is higher for customers who buy the MOQ (minimum order quantity) of 100,000 bottles.
³ The current MMS Taskforce recommendation for MMS dosing is 180 tablets per pregnancy beginning as early as possible.
⁴ Data provided by Contract Pharmaceutical Corporation (CPC), 2019.
⁵ It is more difficult and more costly to recycle Aclar film and foil than it is to recycle HDPE bottles.
⁶ Waste amounts are variable, contingent on both bulk configuration and required repackaging. Excluding repackaging waste, bulk generates the least waste.

UNIMMAP multiple micronutrient supplements (MMS) contain 15 vitamins and minerals consistent with antenatal micronutrient standards that women need to help ensure a healthy pregnancy and a healthy baby.

Regional Production

Some countries are considering developing regional or local manufacturing of UNIMMAP-MMS to fill local demand. Local manufacturing should be encouraged where justified – usually based on whether there is a sufficient need for MMS to warrant local manufacturing at a reasonable cost per beneficiary. Ideally, local pricing should be within range of the benchmark price. However, it may be difficult for countries and local manufacturers to achieve the benchmark price of \$0.01 per tablet. Few countries have high enough demand, most manufacturers don't have the volume capacity needed, and most governments don't allow single-source procurement, which makes it challenging for a country or local manufacturer to achieve economies of scale.

In addition, LMIC manufacturers will need to import ingredients, and the associated fees and taxes, if unadjusted for public health program use, will increase the price of the finished MMS product.¹⁷ Monterrosa et al. report highly variable import taxes across regions, with African countries having the highest tax rates for nutritional products (38-40% in Ghana), while countries like India have lower tax rates for vitamins, and higher tax rates for minerals and vitamin-mineral blends. Some countries, like Colombia and Mexico, have exemptions for raw materials or nutrition ingredients imported from certain countries or for a certain time period.²⁰ These regulations must be considered when planning for regional manufacturing.

Domestic manufacturing is justified in certain cases, including the existence of qualified domestic manufacturers with moderate- to high-volume capacity, or when the number of pregnancies reaches 3-5 million per year.¹⁸ When the decision is made to transition to local manufacturing of UNIMMAP-MMS, a proposed pathway is to:

- Include a transition period utilizing donated MMS products from reputable international donation programs while engaging in a demonstration program on strengthening existing ANC services and conducting implementation research.
- Engage a local manufacturer in the importation and re-distribution of a finished product. This involves qualified local manufacturers in importation and re-packaging while they build out their capacity to manufacture the product locally, which creates incentive and provides a role for them early in the process.
- Purchase UNIMMAP-MMS from a local manufacturer once they successfully show they can manufacture to the open-access product specification. It often takes 12-36 months or more to reach local manufacturing potential.¹⁷

This three-step process (1) allows for immediate activation of MMS and access to a high-quality product manufactured to international quality standards; (2) creates a process for systematic development of a domestically produced product while giving manufacturers time to begin test manufacturing, demonstrate a viable, high-quality, and stable product, and understand foreign export market potential; and (3) incentivizes manufacturers by engaging them as partners early on.¹⁸

Overall, variability of the market, manufacturing capacity and policies across and within regions will affect local production of UNIMMAP-MMS in different countries. Monterrosa et al. found that some countries like Ghana and Nigeria have smaller consumer markets that prefer imported products that will make it difficult to implement local production. These countries would need to have local manufacturers invest in effective marketing campaigns to compete with international brands. These authors also recommended leveraging trade agreements and technology transfer to encourage local affordable supply of MMS.²⁰

Brief Context of MMS Implementation Science

Definition

Applied research in the context of implementation is essential for strategically advancing evidence-based delivery of MMS. Implementation science includes the study of the most effective methods to promote the systematic and global uptake of MMS into routine practice and thereby improve health outcomes. Delivery of MMS encompasses holistic program implementation to increase coverage and promote compliance including: (1) integrating with public and private health systems to promote ANC standards; (2) training for health workers; and (3) behavior change communication to improve compliance. In order to optimize delivery for MMS, implementation research is needed that generates the operational knowledge and documented experiences to ensure high MMS program coverage, adherence, and fidelity at the beneficiary level.

Implementation Research Priorities in MMS²¹

In 2019, a diverse group of 25 researchers assembled as a part of an MMS TAG. This included individuals from NYAS, VA, JHU, UNICEF, the Global Alliance for Improved Nutrition (GAIN), the Forum, and Harvard among other organizations. The MMS TAG used the Child Health and Nutrition Research Initiative methodology to inform the strategic direction and resource investment needed to support the global implementation of MMS for pregnant women across LMIC. This group of international experts developed and then ranked research questions that most imperatively and urgently need to be addressed for the successful global implementation of antenatal MMS interventions.

A total of 73 research topics were reviewed, analyzed, and consolidated into 35 remaining questions. Four criteria were used to score and prioritize the top ten research areas that focused specifically on strategies to increase ANC attendance and MMS adherence, as well as the methods that can identify beneficiaries who will be most impacted by MMS. Ultimately, these 35 research questions were identified as critical for promoting MMS among pregnant women in LMIC.

The research areas that received the highest priority were those that included behavioral change and counseling strategies for CHWs to increase ANC attendance and adherence to MMS, including for difficult to reach populations. Additionally, the researchers gave significant attention to the most field-friendly and cost-effective indicators and methods that are needed to prioritize beneficiaries who are most vulnerable. While the expert consultation did not consider the cost implications of the research questions and the process was notably biased towards academics, the analysis identified several questions that need to be urgently addressed to advance MMS and the wellbeing of women and children globally.

The compiled 35 research questions were categorized into four domains: description, delivery, development, and discovery. The majority of questions fell into the discovery domain. The top five questions are listed below.

1. What strategies (cash transfers, easier ANC access, free MMS, pharmacy vouchers, quality service delivery, mass media, social and behavior change communication interventions, SMS text messages, etc.) can best increase ANC attendance and adherence to MMS, including in hard-to-reach populations? (Delivery)
2. What limited set of biomarkers of nutritional status (e.g., hemoglobin) and their cutoffs can be used to identify populations that will benefit from prenatal MMS? (Description)
3. If MMS were continued through lactation, are there additional benefits for the mother and child (e.g., reduced mortality, infection, improved development, etc.)? (Discovery)
4. Can community workers help identify pregnancies in the first trimester and facilitate timely ANC attendance that leads to earlier initiation of MMS? (Delivery)
5. What is the burden of micronutrient deficiencies among pregnant women? (Description)

Table 2. Sight and Life's Special Report

Recent compelling evidence has found that MMS for pregnant women has better birth outcomes compared to IFA alone. Given this, Sight and Life is putting together a Special Report on MMS for pregnant women, originally scheduled to be launched at the Micronutrient Forum 5th Global Conference in Bangkok in March 2020, now launched digitally on April 28, 2020. The contents of this Special Report will include:

- An overview of what has been accomplished to date in different settings (humanitarian, development, market-based, hierarchical, and grassroots approaches)
- Practical guidance to support program implementers and decision-makers as they consider the deployment and scale-up of MMS in their countries/programs

The intended audience of this Special Report is country governments and their influencers (advisors to the government) and it will bring together all of the evidence, country experiences, and resources for scaling-up that will help a country government in kickstarting an MMS program. Sight and Life plans to share all of the collected and synthesized information in a package format that can be used to make policy decisions.

The MMS Cost-Benefit Tools

Launched in October 2019, the MMS Cost-Benefit Tool is an open access, user-friendly, online analytical tool that supports governments' use of country-specific data in their decision-making on whether investing in antenatal MMS rather than IFA is better value for money. The tool applies a rigorous methodology based on a study by NI and Limestone Analytics that was published in the *Journal of Nutrition*.²² The simple to use tool can generate estimates for the health impact (stillbirth, neonatal mortality, preterm birth, low birth weight, small for gestational age, maternal mortality, and maternal anemia), number of disability-adjusted life years (DALYs) averted, budget impact (cost), and benefit-cost ratio of transitioning to MMS from IFA. The tool is available for free on the [NI website](#), alongside pre-set analyses for 27 countries and a *User Interface and Interpretation Guide*.²³

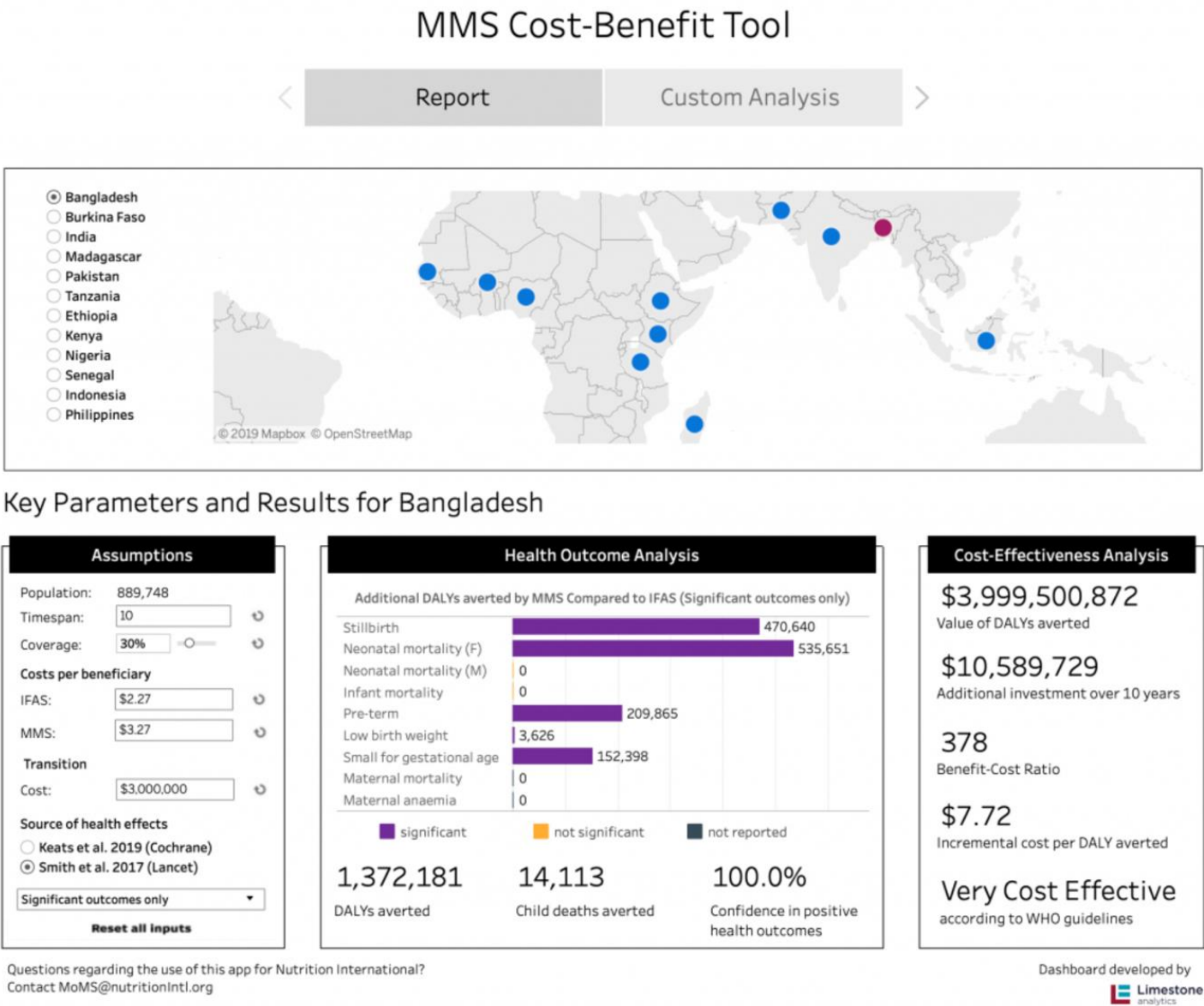
The MMS Cost-Benefit Tool's default supplement unit costs for 180 IFA and 180 MMS tablets are reported from the 2018 UNICEF supply catalogue. There is ongoing work to reduce the cost of the supplement and the tool is designed to allow the user to enter their costs. The user can easily modify the cost of the supplements by entering a value in the Assumptions box in the tool (see Figure 4).

In the 12 country analyses, the findings show with high certainty that MMS is very cost-effective, has a high return on investment, and leads to additional significant positive health outcomes for newborns compared with IFA. Countries can input their specific data points to generate a customized analysis and adjust parameters such as population of pregnant women, coverage, and supplement cost in order to build context-specific investment cases. The tool is being deployed widely as a public resource to facilitate the strategic use of data for policy decisions and investments concerning the introduction of MMS. For example, it is being used to inform decision-making in India, Indonesia, South Africa, Madagascar, Pakistan, Tanzania, Burkina Faso, and Bangladesh. The tool is intended to lead to more efficient use of resources, improvements in birth outcomes, and better overall health, survival, and equality for women.

The information gained from the roll-out of this MMS Cost-Benefit Tool is also being disseminated at national and global forums, conferences, publications, and meetings. NI is currently undertaking cost-effective analyses for 15 additional LMICs; the data from this will be publicly available by March 2020 by accessing the tool online. At the request of the WHO, the MMS

Cost-Benefit Tool was used to conduct additional analyses that were included in the evidence to decision framework for updating the WHO recommendation on the use of MMS in pregnancy.

Figure 4. Sample Analysis from Nutrition International’s MMS Cost-Benefit Tool²⁴



Haiti has demonstrated its commitment to reducing the prevalence of anemia through IFA supplementation for pregnant women, but the prevalence of anemia has remained consistent. Understanding why IFA policy has not translated into an improvement in maternal anemia could inform a more successful implementation of MMS. Following WHO guidelines, pregnant women receive nutrition counseling and the provision of micronutrient supplements during ANC visits.⁵ In Haiti, 90% of pregnant women attend at least one ANC visit during their pregnancy, but only approximately 67% of pregnant women attend the recommended four ANC visits.^{31, 32} In reality, just 62% of women attending an ANC visit in Haiti will receive nutrition counseling.³² A rapid assessment found that of pregnant women attending at least one ANC visit, 83% received IFA tablets.³³ However, only 12% of those women consumed the recommended minimum dose of 180 IFA tablets; most often, women took less than 45 tablets during their pregnancy.³³ This research indicates that the design of MMS interventions should take into account adequate clinical supply of supplements and supplement adherence.

USAID explored the challenges of IFA supply and IFA adherence using data from the Haiti Demographic and Health Survey 2016-2017 and the 2013 Service Provision Assessment. They found that IFA adherence was linked to IFA supply at nearby clinics with adherence tending to increase with highest availability. IFA supply was more available in urban areas: only two-thirds of rural ANC clinics supplied IFA compared to three-fourths of urban facilities. Researchers also found that access to IFA supplements was associated with utilization of ANC services.³⁴

Political Landscape of Micronutrient Supplementation

Currently, Haiti does not have any legislation on MMS for pregnant women. There is an ongoing conversation around including MMS in the National Nutrition Policy, which is currently under review. Haiti's National Guiding Health Plan has laid the foundation for combating micronutrient deficiencies in its Strategy 2.3.6. This action plan outlines micronutrient supplementation for pregnant women and nutritional surveillance for pregnant women.³⁵ The National Guiding Health Plan does not specify which micronutrients are included in the intervention, but it can be assumed based on assessments mentioned above that it is referring to IFA supplementation. As part of Haiti's National Strategic Plan (2013-2018), the government outlined its commitment to preventing micronutrient deficiencies under Strategy 1.2: Prevention and Combating Micronutrient Deficiencies.³⁶ The plan laid out activities used to follow through on this Strategy including the strengthening of routine micronutrient supplementation services. Technical nutrition committees and sectoral groups exist in ten departments and are regularly working with local authorities and outside organizations to ensure better integration into communities. However, according to SUN, the National Strategic Plan was never financed by the government and was excluded from national budget planning.³⁷

UNICEF supports the Haitian Ministry of Public Health and Population (MSPP) in rolling out the SUN roadmap of scaling evidence-based nutrition specific interventions with a focus on the 1,000 days of life from conception through a child's second year. In 2018, UNICEF provided over 5,000 pregnant and lactating women with micronutrient supplements. While it is unspecified whether these provided capsules were MMS or IFA, it is assumed that they are IFA only.³⁰ In 2020, UNICEF's programming will focus on treating acute malnutrition in children directly and does not include targets for improving micronutrient deficiencies in pregnant women.³⁸

SUN has been highly involved in stakeholder alignment and documenting structural progress within the Haitian government. Funding is a recurring issue affecting nutrition legislation. SUN lists several challenges in moving forward on nutrition legislation in the country, including limited government capacity to identify deficits in the budget, unkept promises in funding disbursement, and no common results framework. SUN's priorities for the coming year include continued financial resources and integrating nutrition into donor funding.³⁷

VA, JHU, Haitian Health Foundation, and the MSPP have been conducting implementation research to inform the program implementation and scale-up by: (1) developing and field testing social and behavior change communication (SBCC) strategies and tools intended to support the uptake and adherence of MMS among pregnant women; (2) field testing the provision of MMS, including the distribution platform, supply chain, and cost; and (3) identifying and implementing a methodology to evaluate acceptance, coverage, and adherence to MMS among pregnant women.^{39,40} With guidance from Sight and Life, the team has conducted a desk review including a literature review, a stakeholder analysis, a political, economic, social, technological, legal, health and environmental factors (PESTLHE) analysis, and a program context analysis, which informed their subsequent formative research in the field.

Table 3. Stakeholder Support Key to Vitamin Angels' Work in MMS Implementation

VA has been closely coordinating with the MSPP on nutrition programming for the past 10 years. From the beginning, VA initiated a high level of involvement among key players from multiple MSPP departments, including the Director of Nutrition, Dr. Joseline Marhonne-Pierre, who is also a principal investigator on the MMS implementation project. MSPP has demonstrated interest and support for introducing MMS into ANC practices.

As a result of the MSPP's interest, VA has co-hosted two workshops with key stakeholders, including representation from all ten geographic departments, to move the process forward. The first workshop in June 2018 aimed to review current micronutrient practices and programs for pregnant women and conceptualize effective introduction of MMS into programming. The second workshop in October 2019 reviewed preliminary research findings.⁴⁰

Support and buy-in from MSPP has been crucial to gaining ground in MMS implementation in Haiti. The close relationship between VA and MSPP functions as a result of early and continued involvement during each stage of the process. Political unrest within Haiti has challenged maintaining a timeline on MMS implementation, but the close working relationship between VA, MSPP, and other stakeholders has enabled forward movement despite roadblocks.

Five communes within the Grand-Anse department were selected as the research project sites, based on the high rates of anemia among women of reproductive age, an existing ANC delivery platform, and a history of IFA supplementation. Formative research included in-depth interviews with pregnant women and mothers of children under six months, influential family members of women, and community leaders as well as focus group discussions with health care professionals. This research aimed to assess women's overall attitudes toward and experiences with MMS and ANC. An acceptability trial among pregnant women examined the extent to which MMS was deemed suitable, satisfying, or attractive. The acceptability trial consisted of a two-week home trial and was followed up with in-depth interviews to assess how pregnant women reacted to using MMS.

Outcomes of interest included maternal satisfaction, perceived positive or negative side effects of supplements, desire to continue use, adherence, facilitators and barriers to the daily MMS regimen. Preliminary findings, based on the desk review and formative research, revealed individual, interpersonal, community, health system, and policy barriers to MMS adoption (e.g., taste, social norms, misconceptions, cost, access) and enablers (e.g., family support, doctor guidance, CHWs, availability, ANC services offered). The next steps in this research (February 2020-October 2020) will be to develop and test SBCC tools and a strategy, conduct a baseline survey to measure supplement coverage and adherence, field test MMS implementation based on the developed SBCC strategy, and conduct a subsequent end line survey.⁴⁰

MMS Case Study: Indonesia

Background

Indonesia—the world's largest island country—is a rapidly growing LMIC and a prime example of micronutrient supplementation research and implementation. With a population of over 260.5 million from over 300 ethnic groups speaking 730 languages across over 17,000 islands, the Indonesian health system faces unique challenges.⁴¹ In the four decades leading up to the turn of the century, the country's centralized health system made significant gains in life expectancy, infant mortality, and the total fertility rate as medical care infrastructure grew dramatically. However, the national health system's centralized structure was not able to meet the needs of the complexity, dispersion, and diversity in the population. Decentralization of governance into districts (over 500 at present) reflected the diversity of the country's geography and population, yet included continued challenges in the ability of the health system to meet the entire population's needs and equity gaps.⁴²

In 2014, Indonesia introduced the world's largest Universal Health Coverage (UHC) system, which focused on accommodating diversity by incorporating adaptive implementation approaches grounded in evidence-based research. The UHC expanded quickly and now reaches 203 million people (nearly 80% of the population) making it the largest single-payer scheme in the world, and it has successfully achieved improvements in health equity and service access. Challenges remain, namely reaching the group of individuals who fall within the middle wealth quintiles, and adequately reaching children from birth to four years. Nonetheless, Indonesia's system is ripe for improved coverage and use of services, efficiency of service delivery, and achievement of health and nutrition targets with reduced service fees.⁴¹

While Indonesia has been identified as one of the most rapidly transforming societies with respect to health and nutritional status, in part due to the introduction of the UHC system, maternal deficiencies of MMN remain prevalent and have

motivated several research trials examining the emerging evidence of the benefit of MMS on maternal and neonatal outcomes.

Table 4. Key Research Trials on Micronutrients in Indonesia

<p>The Supplementation with Multiple Micronutrients Intervention Trial (SUMMIT)⁴³ <i>Effect of maternal multiple micronutrient supplementation on fetal loss and infant death in Indonesia: a double-blind, cluster-randomized trial</i></p> <p>SUMMIT, a double-blind, cluster-randomized trial in Lombok, Indonesia, assessed the effect of maternal supplementation with MMN, compared with IFA, on fetal loss and infant death in the setting of routine ANC services. A total of 262 midwives were randomized to distribute IFA or MMN supplements to 31,290 pregnant women through government ANC services that were enhanced through quality training and community-based advocacy. Women took supplements daily, from enrollment to 90 days postpartum.</p> <p>The research found that supplementation during pregnancy with MMN reduced 90-day infant mortality by nearly 20% as compared with IFA (35.5 deaths per 1000 live births vs 43 per 1000; relative risk [RR] 0.82, 95% CI 0.70–0.95, p=0.010). Infants whose mothers were undernourished or anemic at enrollment had a reduction in early infant mortality of 25% and 38%, respectively. Decreased risk of low birthweight was found for those in the MMN group, with a 33% decrease for infants of women who were anemic at enrollment.</p> <p>The study concluded that maternal MMN, compared to IFA, can reduce early infant mortality, especially in undernourished and anemic women. The trial highlighted that maternal MMS may therefore be an important part of overall strengthening of ANC programs.</p> <p>Operations Research on Community Facilitators for MMS Behavior Change⁴⁴ <i>Programmatic effects of a large-scale multiple micronutrient supplementation trial in Indonesia: Using community facilitators as intermediaries for behavior change</i></p> <p>Early formative research on health-care delivery and health-seeking patterns in Indonesia revealed the need for a more direct channel of communication between SUMMIT activities and pregnant women. This led to the development of the community facilitator (CF) role, which became a central component of SUMMIT activities. An operations research analysis published in 2009 documented the programmatic impacts of CF's field activities from the 31,290 SUMMIT enrollees.</p> <p>The role of CFs was to provide information regarding health issues, encourage the women to replenish their stocks of supplements, and assist with social marketing activities. The regular visits of CFs were instrumental in maintaining pregnant women's interest in consuming the supplements as well as addressing any barriers to consumption that may exist.</p> <p>The impact of the CF on compliance levels was effective in both the MMN and the IFA groups. The CFs played a central role in improving health-seeking; however, the quality of the CF's performance was associated with the impact of the micronutrient supplement on infant health. Better-performing facilitators were found to markedly improve the overall impact of the MMN on early infant mortality. There was a 30% reduction in early infant mortality if the CF performed well or above average compared to 22% reduction in the cohort of adequately performing CFs. If a CF performed below average or poorly, little or no impact of the intervention was seen.</p> <p>Therefore, if CHWs, such as CFs, are employed to implement a specific intervention, those benefits will only be realized if the CHW is functioning effectively and is able to obtain regular feedback and support to improve their skills. The data revealed that the more competent the CHW, the greater the overall health impacts can be.</p>
--

Follow-Up of the SUMMIT Trial⁴⁵

Maternal Multiple Micronutrient Supplementation and Other Biomedical and Socioenvironmental Influences on Children's Cognition at age 9-12 years in Indonesia: follow-up of the SUMMIT randomized Trial

A follow-up study of the SUMMIT randomized trial in Indonesia aimed to examine the impact of maternal MMS and other biomedical and socioenvironmental determinants on children's brain and cognitive development. Of 27,356 infants from birth to 3 months in 2001–2004 whose mothers were enrolled in the original SUMMIT trial, 70% (19,274) of children were re-enrolled nine years later, at ages nine to 12 years. The effects of MMN and associations of biomedical (e.g., maternal and child anthropometry, hemoglobin, and preterm birth) and socioenvironmental determinants (e.g., parental education, socioeconomic status, home environment, and maternal depression) on the child's general intellectual ability, declarative memory, procedural memory, executive function, academic achievement, fine motor dexterity, and socioemotional health were studied.

The study found that children whose mothers were given MMN had higher procedural memory than those whose mothers were given IFA [mean score of 0.11 SD (95% CI 0.01–0.20, $p=0.0319$) higher], equivalent to the increase in scores with half a year of schooling. Children of anemic mothers in the MMN group scored significantly higher in general intellectual ability [0.18 SD (0.06–0.31, $p=0.0047$) higher], similar to the increase with one year of schooling. These findings highlighted the fact that maternal MMN may have long-term benefits for child cognitive development at 9–12 years of age, thereby supporting its role in early childhood development, and policy change toward MMN.

Advocacy Efforts

The Indonesian Ministry of Health (MOH) is among the national health services interested in learning more about MMS as a potential replacement for IFA as part of routine antenatal care services. VA conducted an initial assessment to understand how to best support the introduction and scaling of MMS in Indonesia. Through that assessment, VA and the MOH identified the need to review and disseminate recent evidence on MMS to catalyze the introduction of MMS within the national health system, and to support the procurement and manufacturing of a high-quality, low-cost MMS in Indonesia.⁴⁶

Based on these findings, VA partnered with two Indonesian universities (Hasanuddin University and Airlangga University) to co-sponsor a symposium at the ACN in Bali, Indonesia in August 2019 to update participants on global MMS policy and the most recent evidence of the benefits of MMS use as compared to IFA supplementation. Following the symposium, VA hosted a two-part technical consultation to provide participants with an opportunity to:

- Seek guidance from international experts on maternal health and nutrition strategy to inform MOH strategy and policy pertaining to MMS use
- Explore issues, challenges, and opportunities related to immediate access to a standardized MMS product while local capacity is created to meet long-term demand.

MMS Policy Adoption

To build on the momentum and progress generated following the ACN conference and technical consultations, VA sponsored the Indonesian Nutrition Institute's (INI) convening of experts in Indonesia in January 2020 with participants from government, local universities, UNICEF, and other key stakeholders. The primary objective of this meeting was to generate consensus regarding a recommendation pertaining to the adoption of an MMS policy. Key outputs included:

Consensus regarding findings related to MMS use in Indonesia in the following areas:

- **Evidence:** Ample evidence exists to support the consensus regarding the efficacy and safety of MMS in the Indonesia setting, and that evidence is consistent with evidence from more than 20 clinical (efficacy) trials conducted in more than a dozen other countries. Collectively, the available global evidence demonstrates that MMS for pregnant women provides women and their babies with a positive pregnancy experience and her child, a healthy start to life beyond that which can be achieved with IFA alone.^{47, 48, 49}
- **Cost-effectiveness:** Convincing and growing evidence of the cost-effectiveness of MMS interventions as among the most cost-effective ANC interventions available. During the INI MMS Expert Meeting, a portion of this evidence was effectively communicated, and additional available evidence is consistent with the information that was provided.⁵⁰

- **Affordability:** MMS is also demonstrated as affordable with the recent work done in the United States and Europe showing that the contract price for MMS (not including shipping, import fees, and taxes) is on par with IFAS. The global price for UNIMMAP-MMS is about US\$0.01 per tablet when purchased at a volume of 3-5 million, 180 count bottles. VA's survey of manufacturers in Indonesia suggests that locally produced UNIMMAP-MMS can be available for about the same price as imported UNIMMAP-MMS after including shipping and import fees. It was also confirmed through a survey that local IFA supplement prices range from US\$0.03 to US\$0.34 per tablet – suggesting the UNIMMAP-MMS may be less expensive than locally available IFA supplements.
- **Challenges affecting implementation:** Based on the experience with IFAS, participants at the INI MMS Expert Meeting identified that the MMS implementation strategy should anticipate that MMS will inherit some of the same challenges that affect the existing IFAS program, along with some new challenges. This suggests that the MMS implementation strategy should include implementation research to address key challenges along with other initiatives to address critical barriers. Among the key challenges identified are:
 - **Adherence:** While coverage of IFAS is very high (in excess of 90%), the adherence rate of women to the regimen of IFAS is exceedingly low (i.e., 6.7%). Nonetheless, a shift from IFAS to MMS should not be delayed, because the health benefits of MMS use are so much greater than that experienced with IFAS – at any level of IFAS use and adherence. The reasons for lack of adherence to IFAS are, in the main, due to: forgetfulness, women's general lack of interest to consume IFA, and side effects. To neutralize low level of MMS adherence, there is a need to undertake implementation research to: (1) draw on the demonstrated potential of SBCC to identify strategies and messages that can be used to increase acceptance and adherence, and (2) explore the interaction between SBCC and packaging of the MMS product to find more effective and efficient ways to deliver MMS in the context of antenatal care services.
 - **Product Supply:** Symposium participants came to a consensus on the need to use the UNIMMAP-MMS product in Indonesia because it is clinically proven. Participants developed a newfound understanding and consensus that gaining access to a UNIMMAP-MMS product supply is a rate-limiting step to policy implementation. There appears to be consensus on a need for a strategy to secure both immediate and long-term access to product supplies, and that this strategy should include importation of UNIMMAP-MMS product supplies to allow immediate implementation of an MMS policy (i.e., immediate introduction including implementation research), and that during the introduction period, steps should be taken to develop domestic (or local) capacity to manufacture UNIMMAP-MMS.
- **Consensus regarding a need for a formal recommendation that leads to the formation of MMS policy:** Stakeholders at the INI Expert Meeting appeared to be in broad agreement that MMS should be adopted as a matter of health policy in Indonesia, and should be used to replace IFA.
- **Development of an Indonesian MMS Roadmap and Taskforce to support policy adoption:** There appears to be broad consensus that policy formation will be complicated, but there was agreement on the formation of an Indonesia MMS Taskforce, created and led by INI and the Indonesian Academy of Sciences (IAS). The task force would be charged with:
 - Finalizing a “proposed” MMS policy (based on the pre-policy document), and
 - Recommending to the government that it adopt a MMS policy and develop a corresponding implementation strategy.

The policy document should address the intention of the government to shift from IFA to UNIMMAP-MMS, provide broad guidance on the nature of the program, and outline the role of the MOH Research and Development Center to lead a process of forming an implementation strategy to operationalize the policy.

Implementation Strategy

There appears to be an emerging consensus among stakeholders on the components of an implementation strategy that spans a three to five-year period. The initial shape of an implementation strategy for which there is support includes:

- **Phase I: Pre-Policy Phase (1–6 months)**
 - Formation of a technical resource document
 - Creation of a pre-policy resource document that provides guidance to those helping to shape a policy document. This could be done by the MOH.
 - Action by both INI and the IAS to formalize a compendium of the technical evidence and a technical argument for the introduction of UNIMMAP-MMS into Indonesia. This may be in the form of a published journal article.
 - Formation of an Indonesia MMS – Task Force charged with the task of coordinating efforts to formulate an MMS policy for Indonesia that can be recommended to the MOH.
- **Phase II: Initial Introduction (36 months)**

- Shift from IFAS to MMS use in a large population with distribution of UNIMMAP-MMS for 250,000 to 500,000 pregnant women on an annual basis through ANC services in selected districts of the nation. During this phase, use may be made of donated/imported product and/or direct purchase of UNIMMAP-MMS from a global manufacturer that produces consistent with the consensus open-access UNIMMAP-MMS product specification.
- Plan and conduct implementation research to find more effective and efficient ways to improve adherence rates for MMS over the rates achieved with IFAS.
- Based upon implementation research, develop content for communications initiatives, and plan and execute a social campaign and continuing education program for health care workers that aims to increase adherence to the MMS regimen by pregnant mothers.
- Initiate engagement with local manufacturers to ascertain interest, capabilities, and pre-qualify manufacturers to bid; define a pathway to UNIMMAP-MMS product registration, and activate a process for achieving the inclusion of UNIMMAP-MMS on the Indonesian essential medicines list.
 - Explore the inclusion of UNIMMAP-MMS in insurance schemes.
 - Define a procurement process that can be launched as soon as manufacturers demonstrate their ability to manufacture a UNIMMAP-MMS product that meets the product specifications laid out in the consensus open-access UNIMMAP-MMS product specification.
- Phase II: Scaling (starts in month 36, or sooner if feasible)
 - Gain final approval of a locally produced UNIMMAP-MMS product supply
 - Scale use of MMS in districts with high prevalence of anemia
 - Complete scaling with introduction of MMS to all remaining districts

Emerging Role of Technology to Support MMS Scale-Up in Indonesia

In 2007, the SUMMIT Institute of Development (SID) was developed by several former Senior Management Team Members of the SUMMIT trial in order to achieve sustainable improvements in community-level health in Indonesia through participatory evidence-based decision making.⁵² In 2019, the Global Financing Facility (GFF) announced an award of approximately \$6 million USD to SID as a part of the Innovation-to-Scale initiative to scale proven innovations for reduction of maternal and newborn mortality around the time of birth.⁵³ The funding will support the scaling of a tablet-based, open-source, decision-support digital registry system, known as Open Smart Register Platform (OpenSRP), developed by the Adaptive Networks for Care for Scale (ANCS) consortium and a part of SID's Technologies for Health Registers, Information, and Vital Events (THRIVE) Indonesia initiative.

OpenSRP aims to provide an integrated health platform to improve frontline workforce efficiencies, data quality, and timeliness of reproductive, maternal, neonatal and child health interventions (RMNCH) including MMS. The application combines data collection, client management, and reporting workflows into one linked mobile interface which enables CHWs to actively track, enroll, and coordinate care plans through algorithms that automatically identify gaps in care. This allows for the exchange of information among several different healthcare workers, revolutionizing front line care to be integrated and to achieve high coverage and quality.

The first phase of the pilot testing included formative and field assessment research to adapt the OpenSRP platform to Bangladesh, Indonesia, and Pakistan, followed by a quasi-experimental field-testing to assess the deployment to determine the factors necessary for high fidelity implementation, perceived value, worker performance, and health system effect from the OpenSRP platform. Initial implementation has shown significant impact.

The recently funded trial will specifically utilize the app that SID is co-developing with the WHO Department of Reproductive Health for enhanced ANC, delivery care, and PNC. Dr. Anuraj Shankar, Technical Subject Matter Expert with a long history with SID, indicated in an interview with M&IHC that this innovative app includes the integration of MMS and will be scaled-up across 20 districts throughout the country for 15 million people. Further, the app is designed for global deployment by integrating with large government programs designed to achieve UHC as a means of operationalizing the WHO 2016 ANC guidelines and the emerging evidence base on the benefits of MMS on maternal and neonatal outcomes. As of early 2020, the app is actively undergoing further field testing in Indonesia and Brazil, including modification of the platform to support MMS deployment in Indonesia as a standard part of ANC. This would link in decision-making for MMS distribution and tracking of compliance and impact as part of the analytics.

The provincial government of West Nusa Tenggara, the home of the SID, is actively moving ahead with scaling-up of MMS. SID has been collaborating with VA and received an initial one million MMS tablets. They are first targeting distribution via

high performing midwives and for high risk mothers including anemic and malnourished women. The plan is to scale-up the provision of MMN to all women in late 2020 with over 20 million supplements to cover the whole population of the Province (about 5 million people), and then expand to other districts across Indonesia where SID has deployed frontline digital information systems. Based on the outcomes of these initiatives in Indonesia, the developers ultimately hope to expand the use of the app to other countries as part of the roadmap to MMS scaling.

Table 5. Case Study Highlights: Several Factors Impacting MMS Implementation:^{9,54}

Factors for Successful MMS Implementation:

- Key stakeholders understanding the evidence on MMS's efficacy, the evidence on MMS's safety, and the price point parity/comparison between MMS and IFA
- Adequate local and global supply, distribution, and stock monitoring of MMS
- Availability of facility and community delivery platforms
- Promotional materials and job aides at MMS distribution sites
- Strategic communication to gain acceptance by women, families, health workers, and policy makers on the importance and benefits of MMS for all pregnant women
- Capacity building and regular supportive supervision for health workers engaged in MMS
- Involvement of and ownership of MMS by local researchers
- Demand creation of MMS through press and social media
- Uptake of cost-benefit and evidence of safety analyses of MMS among decision makers and policymakers
- Inclusion of MMS on Essential Medication Lists
- Integration with ANC

Potential Barriers to Successful MMS Implementation:

- Lack of explicit global MMS recommendations in WHO policy
- Gaps in understanding drivers of adherence to MMS among pregnant women
- Misconceptions about MMS and its benefits and side effects
- Absence of biomarker data or other indicators of risk of population-level nutritional deficiencies that would increase demand for MMS
- Lack of involvement/recognition of local stakeholders
- Inadequate technical assistance and training for policy makers and implementers
- Barriers in accessibility and delays in first visit of ANC
- Inadequate quality of ANC, in particular quality of health workers' training on MMS guidelines and counseling skills to manage side effects and monitor adherence
- Lack of budget for MMS procurement and distribution
- Misconceptions about and lack of consensus on ideal dose of MMS needed to reap benefits
- Perceived lack of value of MMS by women, families, health workers, and policy makers



Priorities

Priorities

Landscape of Organizational Work and Commitments to MMS

Many organizations are working to improve access and uptake of MMS for pregnant women globally. This section captures the overall MMS work and commitments of those organizations working at global and national levels to address MMS supply, demand, and delivery.

BMGF hosted Goalkeepers 2019, where the *Healthy Mothers, Healthy Babies* Accelerator was launched as a coordinated initiative, led by the Forum, to advance the introduction and implementation of MMS over the next three years. The Accelerator leverages new investments from the private sector, philanthropies, NGOs, and country leadership to save lives and improve the health of millions of women and newborns, address inequity in access to MMS, and make progress toward the SDGs. The Accelerator includes 12 partners, who all have an asterisk placed after their organizational names in the list below as a mechanism to indicate that the respective organization represents an Accelerator partner.

This organizational list has expanded beyond the original Accelerator partners to include those invited to the MMS Stakeholder Consultation in Washington D.C. on February 5th and 6th, 2020. This list is not exhaustive. Specific organizational financial commitments and expenditures were not included in this document for multiple reasons, including confidentiality and a rapidly changing landscape.

- 1,000 Days
- Asia Philanthropy Circle (APC)
- Bill & Melinda Gates Foundation (BMGF)*
- Children's Investment Fund Foundation (CIFF)*
- DSM*
- Emergency Nutrition Network (ENN)
- The Eleanor Crook Foundation (ECF)*
- Family Larsson-Rosenquist Foundation (FLRF)
- Global Affairs Canada (GAC)
- The Global Alliance for Improved Nutrition (GAIN)
- GMMB
- Harvard T.H. Chan School of Public Health (Harvard)
- Helen Keller International (Helen Keller)
- Johns Hopkins University (JHU)
- Kirk Humanitarian (Kirk)*
- Micronutrient Forum (Forum)*
- The New York Academy of Sciences (NYAS)*
- Nutrition International (NI)*
- Power of Nutrition
- Republic of the Union of Myanmar (Myanmar)*
- Sight and Life*
- Summit Institute of Development (SID)
- UNICEF*
- USAID
- Vitamin Angels (VA)*
- The World Bank
- World Food Programme (WFP)
- World Vision

1,000 Days

1,000 Days is a U.S.-based nonprofit that leads the fight to make the well-being of women and children in the first 1,000 days a policy and funding priority. Their work is guided by the science that shows that nutrition early in life sets the foundation for a person's lifelong health and well-being and by the conviction that every child—regardless of where they are born—deserves the best start to life and the opportunity to reach their full potential.

Through strategic partnerships, communications, and advocacy efforts, 1,000 Days seeks to influence policy and practice and build public awareness to improve nutrition for women and children around the world. The hallmark of 1,000 Days' work is building and leading coalitions of diverse stakeholders and aligning groups around a common agenda for action. Since their inception in 2010, 1,000 Days has mobilized advocates, thought-leaders, policymakers and their network of partners to improve nutrition for women and children in the U.S. and globally.

1,000 Days is a longstanding champion of MMS, and looks forward to exploring how it can continue to engage in the MMS space to advance its advocacy.

Asia Philanthropy Circle (APC)

APC is a membership-based platform for philanthropists to exchange, coordinate and collaborate, to advance a better Asia. Founded in 2015 by philanthropists for philanthropists, its mission is to accelerate private action for the public good by addressing systemic challenges through collaborative philanthropy. One area that APC members have collectively come together to work on is in the space of nutrition and MMS. The Thousand Days Fund is driven by a collective of APC members and is the first impact focused pooled philanthropic fund for Asia that addresses stunting. APC has partnered with the Power of Nutrition to multiply donor funds by 4 times by working with a variety of government agencies and nonprofits to unlock and leverage funds for greater impact. Through a consultative and participatory programme design process with APC over the past two years, the Power of Nutrition has developed a consortium of implementing partners to co-fund, design, and deliver a programme to fight stunting in Indonesia, where 8.7 million children,⁵⁵ or half of the Association of Southeast Asian Nations (ASEAN) region's burden, suffer from stunted growth.

The fund will support the implementation of the \$10 million Better Investment for Stunting Alleviation (BISA) programme. BISA is designed to address a specific set of challenges that pose serious barriers to better nutrition among women, adolescent girls, and children in Nusa Tenggara Timur and West Java through three main objectives and activities. They are:

1. Improving practices at the community level through introduction of SBCC strategies on maternal, infant, and young child nutrition and hygiene practices.
2. Improving government capacity at the district level by providing technical assistance to provincial government and health service providers in their delivery and accessibility of IFA for pregnant women and pregnant adolescent girls.
3. Ensuring better coordination to governments of different levels to improve the allocation and effective use of funding at the provincial, district, and village levels.

The five-year, \$10 million programme aims to enable 3.3 million people, including over 700,000 women, almost 490,000 children under two, and 1.45 million adolescent girls, to access high impact nutrition services.

Bill & Melinda Gates Foundation (BMGF)*

BMGF's Goalkeepers Accelerators bring together partners from different sectors around common agendas for action – seeking to catalyze investments, expertise, and innovation to drive further progress towards the SDGs. Currently, the BMGF launches new Accelerators at the annual Goalkeepers event during the UN General Assembly in New York. The Healthy Mothers, Healthy Babies Accelerator was launched on September 25 at Goalkeepers 2019.

BMGF is interested in addressing the main challenges to scaling-up MMS across all evidence, supply, delivery, financing, and monitoring/surveillance. In addition to BMGF's advocacy work, they currently have the following investments:

1. NYAS (grant period 2017–2022) with the objectives:
 - Assemble a global MMS TAG comprised of international experts in micronutrient deficiencies, public health, nutrition, pediatrics and health economics to (1) compile the evidence on the prevalence of micronutrient deficiencies in pregnant women or women of reproductive age, and (2) review the evidence on the benefits and risks of multiple micronutrient supplements on maternal and perinatal outcomes

- Create a technical assistance guidelines/roadmap guide decisions in countries considering the implementation of MMS
2. UNICEF (grant period 2018–2021) with the objectives:
 - Lead the development of operational experiences on MMS use among pregnant women living in four countries: Bangladesh, Madagascar, Burkina Faso, and Tanzania
 - Use the introduction of MMS as an opportunity to address other barriers to the provision of antenatal nutrition services to pregnant women and to spur increased attention to addressing maternal nutrition among national governments in the four countries
 - At the global level, UNICEF is seeking to create an affordable supply of MMS through their Supply Division and national governments with the MMS TAG
 3. The Center for Human Nutrition at JHU (grant period 2016–2020) with the objectives:
 - “JiVitA-5” is a cluster-randomized, double-masked, placebo-controlled trial currently underway among nulligravid newlywed women in Bangladesh to assess the efficacy of preconceptional-through-first trimester multiple micronutrient supplementation in improving health and birth outcomes in 1st pregnancies.
 - Specifically, the trial is designed to reveal health effects of improving materno-fetal micronutrient nutriture throughout the periconceptional period.

Children’s Investment Fund Foundation (CIFF)*

CIFF is the world's largest philanthropy that focuses specifically on improving children's lives. CIFF works with a wide range of partners, and areas of work include maternal and child health, adolescent sexual health, nutrition, education, deworming, tackling child slavery and exploitation, and supporting smart ways to slow down and stop climate change.

“One MMS a Day and a Healthy Baby is on the Way: An investment to set up a sustainable social business model for multiple micronutrient supplements for pregnant women through pharmacy networks in Bangladesh”

Context: Bangladesh has the highest prevalence of low birth weight children in the world at 28% (2019 data). Micronutrient deficiency is a major risk factor for low birth weight. Robust evidence shows that MMS containing 15 essential vitamins and minerals have resulted in a 12% reduction in low birth weight (LBW) and an 8% reduction in Small Babies (small for gestational age) compared to IFA in 14 LMICs. In spite of this evidence, millions of mothers in Bangladesh do not have access to MMS and continue to give birth to small and weak babies.

CIFF and partners had successfully implemented the largest socio-commercial model of micronutrient powder for children in Bangladesh - more than 145 million sachets were sold over five years and this contributed to a 16% point reduction in anemia in the intervention group. Based on CIFF’s prior experience, the government of Bangladesh is ready to work on MMS.

Transformative Proposition: CIFF and partners will set up a sustainable business model where affordable MMS of assured quality is available to every pregnant woman in Bangladesh.

Investment Components: The investment will have two phases. The first two years will be an inception phase for a sustainable business model. Years three to five will be nationwide scale up with a ‘pay for performance’ contract to the partner.

1. Product: CIFF and partners will help shape the market for MMS by getting quality products at the right price. Currently 5 brands of MMS are available in Bangladesh, but none match the UNIMMAP formulation which has shown impact on birth outcomes. CIFF and partners have negotiated with Renata to develop the product. Renata has started developing MMS – a small first batch has been manufactured, verified by lab tests and is currently undergoing shelf life studies.
2. Price: Bangladesh has a thriving pharmaceutical industry. More than 15 million MMS have been produced locally for clinical trials. The Drug Administration has set a price ceiling on supplements, a low import duty of 5% on the straight ingredients and prohibitively high import duty on finished supplements from foreign companies. This creates a favorable regulatory environment for affordable pricing of MMS while enabling local industry. Based on CIFF’s market analysis and product benchmarking, the price of current MMS brands in Bangladesh range from \$1.8

to \$2.1 for a pack of 30 tablets. CIFF and partners have successfully negotiated the price to \$1 for 30 tablets using the UNIMMAP formulation.

3. **Placement:** Distribute the product across SMC's extensive pharmacy network: Green, Blue & Pink Star Providers. CIFF tested the SMC pharmacy model for multiple micronutrient powders (MNPs) during a previous investment and found that pharmacy sales are 2 times more than BRAC's door-to-door sales in the same sub-districts. SMC operates a 12,000 strong social franchising network of community level private medical practitioners and pharmacists who offer affordable public health products and services including medicines. Overall, SMC sales force covers half the network (i.e., 120,000 pharmacies). According to the Bangladesh Demographic & Health Survey, SMC network had more than half of the national sales in established categories such as oral contraceptive pills, condoms, and oral saline.
4. **Promotion:** B2B demand creation with health providers: As pregnant women trust health care professionals, their buy-in is key for successful MMS uptake. Based on successful supplement marketing tactics, strategic B2B engagement at the start of a product launch involves sales pitch by SMC's medical and sales officers, product activation events and branded merchandising. B2C demand creation for consumers and their key influencers: B2C activities will focus on (1) Creating a social norm for prenatal supplementation, (2) Generating a 'buzz' for the product, (3) Creating value in the minds of consumers (as they don't perceive the need), and (4) supporting the formation of a daily supplementation habit. B2B and B2C activities will be strategically integrated and designed based on in-depth human-centered-design research with providers and consumers. A complete customer journey, opportunities for customer segmentation and value creation will be further defined through research.

Digital Interface with Consumers: Mobile phone ownership, especially smartphones, is increasing rapidly and offers an opportunity to engage consumers regularly and increase compliance for MMS. To ensure compliance, SMC's existing consumer facing digital interface will be leveraged to send relevant information on pregnancy and MMS related voice and text messages and collect feedback from consumers.

5. **Policy:** CIFF will support the national-level Technical Advisory Group (TAG) by investing in GAIN to set and harmonize standards, ensure high-quality local production, and advocate for its inclusion in Bangladesh's EML and national standard treatment guidelines. The TAG will be led by the National Nutrition Services (NNS) in collaboration with different Directorates and Departments of Ministry of Health and Family Welfare (MOHFW), different Ministries/Directorates, UNICEF, GAIN, WHO, Sight and Life, icddr, Alive and Thrive, NI, Social Marketing Company (SMC) and partners.

The Bangladesh government is ready to champion the agenda and generate insights and recommendations for WHO. As national policies incorporate MMS, WHO will feel the pressure to revise their guidelines.

DSM*

DSM is a purpose-led, performance-driven multinational active in the fields of health, nutrition, and sustainable living. DSM has long been a supporter in the scale-up of micronutrient supplementation and fortification for the world's most vulnerable. As they are primarily a science-based company, DSM provides innovative nutrition solutions and technical support for food fortification and supplementation programs. The focus of DSM's work in the MMS space is to partner with manufacturers, retailers, INGOs and Governments to provide innovative and cost effective product solutions and technical support and together with partners, to advocate for and build further demand and support distribution of MMS globally.

Initially DSM is working to improve MMS demand and supply in Indonesia. They are executing this through a technology transfer and technical support (using UNIMMAP premix) to local manufacturer(s) to produce high quality and safe MMS in order to help build a domestic network of high-quality MMS producers. They are also fostering demand creation and innovative distribution channels with their partner HaloDoc/Go-Med (Indonesia).

Through telemedicine, HaloDoc can reach over 40 million Indonesians and 45,000 midwives who can order medicines (to be delivered by local partner Go-Jek) to their home, even in the most remote areas of the country. HaloDoc is interested in raising awareness of the importance of antenatal nutrition and the benefits of MMS with its over 40 million users. They also train midwives on maternal nutrition and will aim to provide access to affordable MMS through their network of midwives and 1,000 partner pharmacies and hospitals to HaloDoc's customers.

DSM is also providing technical support to advancing MMS through the development of a standardized premix to universally meet the UNIMMAP formulation specifications. The use of this standardized premix reduces safety concerns and will help ensure local manufacturers will meet international standards (e.g., selenium overdosing when straights are blended locally).

DSM, being a B2B company, has a strong customer base of supplement brand owners, and connections to global and regional retailers. DSM will work to encourage brand owners and retailers to develop and make accessible affordable MMS brands to ensure the availability and accessibility of MMS products to people who need them the most. Together with their global non-profit partners, DSM will continue to advocate for the scale-up of MMS on global and regional platforms.

In certain contexts, DSM may be willing to donate and/or discount certain quantities of premix to jump-start local production for manufacturers supplying MMS to government and social safety net programs. When DSM is in a position to supply the finished product, they may be willing to make MMS donations and/or offer discounted prices based on a minimum volume procured.

Emergency Nutrition Network (ENN)

ENN is an established UK based charity. They work with national governments, UN agencies, NGOs, and research institutions worldwide to look critically at existing policies and practices, raise awareness of issues and drive change so that those working to tackle malnutrition can do the best job possible. ENN connects people designing and delivering programmes in countries with those working at international level in policy, guidance and research, providing invaluable access to cutting edge developments.

To do this, they capture timely in-country learning through their knowledge management portfolio of publications (Field Exchange, Nutrition Exchange) and online platforms (en-net technical forum and Global Media Hub). ENN drives forward research agendas to address gaps affecting the most vulnerable and convene several international expert groups of experienced practitioners and researchers. They are a trusted thought partner, bringing their knowledge and technical expertise to inform and strengthen activities of global organizations.

ENN is interested to explore if and what they can bring to the MMS space in terms of capture and dissemination of experiences, initiatives, priorities and gaps; relevance for their existing technical expert groups; and to build their technical insight into this area.

Eleanor Crook Foundation (ECF)*

ECF is a U.S. philanthropy committed to research and advocacy to end global malnutrition. ECF is pleased to commit new funding for research and advocacy which will help countries in East Africa generate the additional evidence and solutions they need to make the switch from IFA to MMS. ECF will invest to improve the efficiency and effectiveness of MMS delivery at scale in key East African countries where there's significant governmental interest in scaling up MMS. This may take the form of implementation research or pilot activities to identify and test delivery platforms. It will also involve country-level advocacy activities to ensure the prioritization of MMS delivery in national guidelines as the antenatal standard of care.

Understanding that adherence to IFA supplementation by pregnant women in developing countries is generally low, ECF will also invest to generate demand for MMS from pregnant women in developing countries, once delivery and supply are established. This may take the form of implementation research or pilot activities to identify the enablers and barriers in the countries of focus in support of increased uptake of MMS, and to identify the most successful ways to increase demand from pregnant women.

The work ECF intends to support will be at the national level, with national policy change as a primary end goal. Scalability and sustainability are key priorities for ECF. Therefore, building and sustaining partnerships with key government stakeholders is of utmost importance in order to ensure early buy-in and ownership of improved approaches. Building the capacity of existing government systems is critical to ensuring that any progress made is sustainable in the long-term. ECF will partner with relevant local and national governments at every stage of this investment, as well as other key stakeholders working towards the same objectives around scale up of MMS and adherence to MMS protocols by pregnant women.

Family Larsson-Rosenquist Foundation (FLRF)

FLRF was established in 2013, born from the vision of a world in which every child is granted an optimum start in life through the benefits of breastmilk. Based in Frauenfeld, Switzerland, it is one of the world's only philanthropic foundations dedicated entirely to supporting and promoting breastfeeding and breastmilk.

Backed by sound science, the FLRF's objective is to drive changes in practice that will increase rates of breastfeeding, and improve the health of mothers and children worldwide. They further this objective by contributing to the long-term discovery, dissemination, and deployment of evidence-based knowledge. Together with a global network of leading experts, they are creating publicly available, sustainable resources and educational tools that help healthcare providers, governments, communities and families overcome obstacles and achieve their breastfeeding goals.

About the intrinsic relationship between mother health, breastfeeding, and child health and development:

Research shows breastfeeding is more than just food - it more closely resembles an external umbilical cord, providing the nutrients and protective elements children need to ward off diseases and supports the development of their physical and neurocognitive potential. Thus, just as MMS is crucial during pregnancy for optimal fetal health and development, MMS is equally crucial during breastfeeding for optimal child health and development that could be impaired if critical micronutrients are missing in mothers in low resource settings.

Like those active in the field of MMS, practitioners in the field of breastfeeding are ultimately interested in achieving improved maternal and infant health during the first 1,000 days, where much of the foundation of positive later life health outcomes is determined. As a foundation active in the field of breastfeeding and human milk the FLRF strongly believes in an integrated approach and believes that a more holistic approach to the first 1,000 days is needed. Hence, they believe that a closer cooperation between both fields will help to reach this aim.

The Global Alliance for Improved Nutrition (GAIN)

GAIN is a Swiss-based foundation launched at the UN in 2002 to tackle the human suffering caused by malnutrition. Working with both governments and businesses, GAIN aims to transform food systems so that they deliver more nutritious food for all people. GAIN believes that everyone in the world should have access to nutritious and safe food. They work to understand and deliver specific solutions to the daily challenge of food insecurity faced by poor people. By understanding that there is no 'one-size-fits-all' model, they develop alliances and build tailored programs, using a variety of flexible models and approaches. GAIN builds alliances between governments, local and global businesses, and civil society to deliver sustainable improvements at scale. They are a part of a global network of partners working together to create sustainable solutions to malnutrition. Through alliances, they provide technical, financial and policy support to key participants in the food system. They use specific learning, evidence of impact, and results of projects and programs to shape and influence the actions of others.

GAIN has previously worked on promoting infant and young child feeding (IYCF) including MNPs to meet the micronutrient deficiencies among children from 6-59 months: at the global level, they focused on advocacy (e.g., through the Home Fortification Technical Advisory Group and expert consultations) and at national levels they focused on delivery (particularly market models), and implementation research pertaining to this delivery and understanding the coverage cascade from supply through demand and utilization.

GAIN is building on this accumulated experience with new efforts on MMS. In Bangladesh, they pilot-tested the feasibility of using BRAC's CHWs' platform for the sale of MMS to Pregnant and Lactating Women (PLW) in two districts of Bangladesh. GAIN confirmed that the frontline worker platform has the potential to ensure delivery of MMS for PLW. Sales can be supported through adequate supply and proper training of frontline workers to understand the benefits of MMS including information related to the product and ensuring a profit margin from the sale of MMS.

GAIN is currently a partner on the CIFF supported project "One MMS a Day and a Healthy Baby is on the Way: An investment to set up a sustainable social business model for multiple micronutrient supplements for pregnant women through pharmacy networks in Bangladesh." As a part of this project implemented with SMC; GAIN, UNICEF, and partners in-country will support a government led Technical Advisory Group to harmonize standards on MMS, support a transition to high-quality local production and advocate for its inclusion in Bangladesh's EML and national standard treatment guidelines.

In other geographies, GAIN is pursuing country-led opportunities and partnerships to work across three areas: (1) developing a sustainable business model for delivery, (2) working with the government on national policy and guidance, and (3) conducting implementation research designed to elucidate barriers and facilitators of effective coverage and maximize potential for impact.

Global Affairs Canada (GAC)

Global Affairs Canada manages Canada's diplomatic relations, provides consular services to Canadians, promotes the country's international trade, and leads Canada's international development and humanitarian assistance. In June 2017, Canada launched its "Feminist International Assistance Policy" (FIAP), which recognizes that supporting gender equality and the empowerment of women and girls is the best way to build a more peaceful, more inclusive and more prosperous world. It supports targeted investments, partnerships, innovation, and advocacy efforts with the greatest potential to close gender gaps and improve everyone's chance for success.

The focus of Global Affairs Canada's work in Nutrition:

Canada's Feminist International Assistance Policy identifies the inherent link between nutrition and the attainment of key rights for women and girls, such as education and health. Canada is working to improve gender-sensitive nutrition for the poorest and most marginalized by enhancing access to nutritious food, micronutrients, and comprehensive nutrition services, and contributes to supporting nutrition-sensitive food systems through life. This entails a focus on women, adolescents, and young children to address undernutrition and micronutrient deficiencies first and foremost.

Global Affairs Canada (GAC) is working with partners to accelerate improvements towards the 2025 World Health Assembly (WHA) Global Nutrition Targets by scaling up low-cost and high-impact nutrition interventions. This includes increasing community capacity to produce and access nutritious and diverse foods and supporting multi-sectoral innovative delivery platforms that respond to the nutrition needs of women, adolescents and young children. GAC also encourages new product development and technology transfers to address the remaining barriers to adequate nutrition and seeks to support leveraged investments that increase the provision of micronutrient supplements, including iron and folic acid to reduce the prevalence of anemia among women and adolescent girls and improve birth outcomes. Through our partners, Canada is supporting analyses and context-specific policy guidance on the use of Multiple Micronutrient Supplement (MMS), ensuring it is guided by country-driven decision making, as an opportunity to accelerate progress towards the WHA targets.

GMMB

GMMB is an issue advocacy and communications firm working with organizations around the world dedicated to improving maternal, infant, and young child nutrition. They collaborate with national leaders and global partners to make MMS a priority, increase funding, and maximize the efficacy of existing and emerging programs.

Harvard T.H. Chan School of Public Health (Harvard)

The overarching mission of Harvard is to advance the public's health through learning, discovery, and communication. To pursue this mission, they produce knowledge through research, reproduce knowledge through higher education, and translate knowledge into evidence that can be communicated to the public, policymakers, and practitioners to advance the health of populations.

Harvard is conducting a project in collaboration with Swiss TPH to estimate the human capital gains from scaling up maternal nutrition interventions in pregnancy, including MMS, in over 130 LMIC. The team will estimate the potential years of education gained and lifetime wage returns to scale-up MMS and other maternal nutrition interventions at the national, regional, and global level. Results are expected by May 2020.

Harvard T.H. Chan School of Public Health and Republic of the Union of Myanmar

'Improving Adherence to Multiple Micronutrient Supplementation Among Pregnant Women in Myanmar.'

There are two main objectives of this MMS research project. The first objective is to assess enablers and barriers to high adherence to MMS among pregnant women through a qualitative evaluation. The second objective is to assess the effect of providing a 180 MMS tablets at the first ANC visit as compared to the current standard of giving a 30-day tablet supply of MMS that is refilled at each ANC visit.

The study will have two components: a qualitative study and a cluster-randomized trial. The qualitative component will assess perceptions of maternal nutrition and MMS and barriers and enablers to high MMS adherence. Researchers will also conduct a cluster-randomized trial to evaluate the effect of providing 180 MMS tablets at the first ANC visit as compared to a refillable 30-day tablet supply of MMS at each ANC visit. This mixed methods study will provide data on MMS adherence and provide evidence for decision-making on delivery mechanisms for MMS in Myanmar. The proposed study sites are 16 Health Centers in Naypyidaw Union Territory and Shan State. The current status of this research is planning questionnaires, obtaining IRB approval, and implementation. The estimate to begin enrollment is approximately June of 2020.

Helen Keller International (Helen Keller)

Helen Keller is a global health organization dedicated to eliminating preventable vision loss, malnutrition, and diseases of poverty. Cofounded by Helen Keller—and guided by her fierce optimism and belief in human potential—the organization delivers life-changing health solutions to vulnerable families in places where the need is great but access to care is limited. In the U.S., Africa, and Asia, Helen Keller’s proven, science-based programs empower people to create opportunities in their own lives and build lasting change.

Helen Keller strives to create a world without barriers to sight, health, and human potential. Its programs extend the reach and quality of health services in 12 countries in Africa and 6 in Asia. With respect to its nutrition priorities, Helen Keller takes a comprehensive approach to assuring optimal nutrition and health for women and children in the critical “first 1,000 days” from the beginning of pregnancy to the child’s second birthday, when the foundation for a healthy, productive life is forged. This entails assessing the major causes of poor nutrition and adapting evidence-based interventions to local contexts and capacities. Interventions include improving access to a diversity of nutrient-rich foods; assuring families understand and adopt health and hygiene practices that avoid diseases that sap growth; helping shift social norms to empower women and youth to realize their full potential; and, where food systems fail, assuring access to micronutrient supplements to fill the gaps. Recognizing there is always room for improvement, Helen Keller also strives to evaluate the effectiveness of its programs to strengthen delivery and to develop approaches to scale up the reach of high impact interventions so that all families in need receive them. Helen Keller enjoys a long history of collaboration with the local and national governments and UN actors in the countries in which it works.

Helen Keller’s major nutrition intervention areas include (1) micronutrient supplementation (preschool vitamin A supplementation, antenatal micronutrient supplementation, and where appropriate, micronutrient powders for children 6-23 months of age); (2) social and behavior change to promote essential nutrition and hygiene actions; (3) prevention and treatment of acute malnutrition; (4) large-scale food fortification; (5) biofortification; (6) nutrition-sensitive agriculture through enhanced homestead food production; (7) integration of gender-sensitive and transformative approaches in its nutrition programs; (8) nutrition research and advocacy to shape global and national policies to reduce the inappropriate promotion of foods to infants and young children; and (9) implementation research to improve the reach and quality of nutrition interventions delivered at scale.

Based on a review of global evidence, Helen Keller supports the transition from antenatal IFA to MMS. It feels this transition can best be achieved by including MMS in a broader strategy that refocuses, reprioritizes, and re-energizes essential services for women’s health and nutrition—including improved diets.

To date, Helen Keller’s engagement with MMS includes:

- Participating and presenting on Demand Generation at the 2018 2nd Task Force on MNS in Pregnancy organized by NYAS
- Knowledge sharing of MMS findings across Helen Keller’s countries

Relevant MMS publications with Helen Keller contributions include:

Bourassa MW, Osendarp SJM, Adu-Afarwah 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;1444(1):6–21. <https://nyaspubs.onlinelibrary.wiley.com/doi/full/10.1111/nyas.14121>

Johns Hopkins Bloomberg School of Public Health (JHU)

JHU is dedicated to the improvement of health for all people through discovery, dissemination, and translation of knowledge, and the education of a diverse global community of research scientists, public health professionals and policy makers to advance the public’s health. Researchers in the Center for Human Nutrition and Dept of International Health have been investigating the prevalence and public health impact of preventing micronutrient deficiencies in children and mothers for 40 years.

Initially focused on discerning effects of vitamin A and zinc on reducing child mortality and morbidity, JHU’s Nutrition faculty extended investigations into the assessment and prevention of maternal micronutrient deficiencies in the 1990s, starting with vitamin A/beta-carotene, iron and folic acid, and expanding to assess the impact of MMS on maternal-fetal and infant health at the turn of the millennium. JHU faculty participated in the 1999 UNICEF workshop in New York that established the formulation of the UNIMMAP supplement used today. Over the past two decades JHU has conducted several randomized controlled trials (RCTs) to reveal the efficacy and safety of MMS in lowering risks of adverse pregnancy outcomes, including low birth weight, preterm birth and stillbirth, and improving postnatal child health, growth, development and survival.

Currently, JHU is conducting an RCT to evaluate effects of pre/peri-conceptional MMS through the 1st trimester of pregnancy among 18,000 nulligravid newlyweds in rural Bangladesh. JHU faculty were members of the NYAS Task Force that published several papers in support of switching from IFA supplementation to MMS in pregnancy and serve on the MMS TAG.

Selected MMS-focused publications include:

- Christian P, Khatry SK, Katz J, Pradhan EK, LeClerq SC, Shrestha SR, Adhikari RK, Sommer A, West KP Jr. Effects of alternative maternal micronutrient supplements on low birth weight in rural Nepal. A double-masked randomized community trial. *BMJ* 2003;326:571-576.
- Christian P, West KP Jr, Khatry SK, LeClerq SC, Pradhan EK, Katz J, Shrestha SR, Sommer A. Effects of maternal micronutrient supplementation on fetal loss and infant mortality: a cluster-randomized trial in Nepal. *Am J Clin Nutr* 2003;78:1194-1202.
- West KP Jr, Shamim AA, Mehra S, Labrique AB, Ali H, Shaikh S, Klemm RDW, Wu LSF, Mitra M, Haque R, Hanif AAM, Massie AB, Merrill RD, Schulze KJ, Christian P. Effect of maternal multiple micronutrient versus iron-folic acid supplementation on infant mortality and adverse birth outcomes in rural Bangladesh: the JiVitA-3 randomized trial. *JAMA* 2014;312:2649-2658.
- Schulze KJ, Mehra S, Shaikh S, Ali H, Shamim AA, Wu LSF, Mitra M, Arguello MA, Kmush B, Sungpuag P, Udomkesmelee E, Merrill R, Klemm RDW, Ullah B, Labrique AB, West KP Jr., Christian P. Antenatal multiple micronutrient supplementation compared to iron-folic acid affects micronutrient status but does not eliminate deficiencies in a randomized controlled trial among pregnant women of rural Bangladesh. *J Nutr* 2019;149:1260-1270.
- Gernand AD, Schulze KJ, Stewart CP, West KP Jr, Christian P. Micronutrient deficiencies in pregnancy worldwide: health effects and prevention. *Nature Rev Endocrinol*, 2016;12:274-289.

Kirk Humanitarian*

Kirk Humanitarian has been at the forefront of driving the MMS agenda for nearly two decades. As one of the only organizations with the sole focus on improving maternal and child health via MMS, Kirk Humanitarian, a 501(c)(3) organization, aims to accelerate the availability, access, uptake, and use of MMS among women at risk of undernutrition during pregnancy to create a healthier and more equitable world. It takes a multi-pronged approach to strengthen supply, demand, and delivery of MMS.

Founded in 2002, Kirk Humanitarian has emerged as the largest supplier of MMS. The organization has donated a supply to cover the duration of pregnancy for well-over 11 million women and has made notable commitments to continue to provide supply. At the 2019 Goalkeepers event, Kirk Humanitarian signed on to the Healthy Mothers, Healthy Babies Accelerator and pledged to donate a supply for an additional 15 million women to LMIC governments and NGOs over the next three years.

In negotiating with manufacturers, Kirk Humanitarian has reduced the benchmark cost of UNIMMAP-MMS four-fold (to \$2.02 USD per 180-count bottle at a high-volume production via CPC), demonstrating that it can be available at cost parity with IFA, while maintaining or exceeding quality standards. The price point includes USP verification, Halal certification, and safety mechanisms including a child-resistant cap. It has also helped equip DSM to produce MMS at \$2.20 USD per 180-count bottle at high-volumes with these standards.

Kirk Humanitarian has also been a notable driver of implementation research, funding research in Bangladesh, Indonesia, and Myanmar conducted by JHU and Harvard. This research will help to ready countries to transition from IFA to MMS and inform program design, so that MMS uptake and adherence are strong. Conducting this research is an important step to better ensure that MMS is introduced in a way that is sustainable and set up to generate maximum impact.

Kirk Humanitarian is also working with LMIC governments, including the Republic of the Union of Myanmar, to establish national MMS programs. In doing so, Kirk Humanitarian has become integral in supporting some of the largest MMS programs, so that women in need can access MMS now.

Finally, Kirk Humanitarian helps to lead global advocacy, as a key funder of stakeholder convening and conferences and as a commissioner of reports (including this landscape analysis and Sight and Life's Special Report on MMS). Kirk Humanitarian is committed to breaking down silos and encouraging the exchange of information across sectors to smartly accelerate action.

Kirk Humanitarian operates with urgency, knowing that millions of women and children around the world need MMS now and will need MMS in the years to come. ANC must improve, especially for women in LMICs, and ensuring that women have access to and take MMS rather than the less efficacious IFA during pregnancy is paramount to usher in a new, more equitable era.

The Micronutrient Forum (Forum)*

The Forum is a micronutrient expert organization that facilitates dialogue and collective action to ensure efforts to support micronutrient health are evidence-based, comprehensive, cost-efficient, and effective. The Forum seeks to ensure that all pregnant women who need it have access to MMS by; coordinating action; advocating for broad adoption of MMS as the standard of care; and ensuring strong demand, prevalent high-quality supply, and effective delivery.

The Forum is committed to coordinating action on the scale-up of MMS, including harmonizing and disseminating efforts globally, leveraging their network to address any technical barriers, and participating in advocacy for the national and global normative adoption of MMS. The Forum serves as the tentpole partner for the 2019 Goalkeepers Accelerator, *Healthy Mothers, Healthy Babies*. It solicited and organized commitments, and is developing a monitoring system to track and socialize progress.

The Forum works with a broad set of stakeholders to address key technical barriers such as guidelines for procurement and integration into national health systems. The Forum also partners with other global scientific, implementing, research, and advocacy organizations to promote MMS as the standard of care for pregnant women.

New York Academy of Sciences (NYAS)*

The Nutrition Science Program at NYAS is dedicated to advancing nutrition science research and knowledge, and applying their work in the field to mobilize communities. Following the release of the 2016 WHO Antenatal Care Guidelines, NYAS assembled a scientific task force comprised of international experts in micronutrient deficiencies, public health, nutrition, pediatrics and health economics with support from BMGF. This task force worked to compile the evidence on the prevalence of micronutrient deficiencies in pregnant women or women of reproductive age and review the evidence on the benefits and risks of MMS on maternal and perinatal outcomes. The findings from the first phase of this initiative show micronutrient deficiencies and adverse birth outcomes are widely prevalent, especially in LMIC, and that there are substantial benefits, in terms of reducing mortality and adverse outcomes, by shifting from IFA to MMS in antenatal care programs. The outcomes of the task force, including an analysis of the risks of reaching the upper limit and the cost-effectiveness, were published in a 2019 special issue of the *Annals of the New York Academy of Sciences*.

Currently NYAS is hosting and facilitating the MMS TAG whose goal is to provide technical and informational support to countries contemplating whether to switch from IFA to MMS during pregnancy and to advocate for the benefits of MMS on birth outcomes. As part of the MMS TAG's efforts, NYAS conducted a research prioritization exercise using the Child Health and Nutrition Research Initiative (CHNRI) methodology to identify key knowledge gaps in the implementation of MMS interventions. To follow-up on one aspect of the results of the CHNRI exercise, NYAS is now leading a systematic review to identify interventions that improve adherence to supplementation during pregnancy. Along with the Forum, NYAS is also working to develop a product specification that will be released in March 2020. Lastly, the NYAS website serves as a platform for dissemination of information and resources created by the MMS TAG (www.nyas.org/MMS).

MMS-TAG members include:

Rina Agustina, Clayton Ajello, Sufia Askari, Obey Assery, Gilles Bergeron, Nita Bhandari, Robert Black, Jennifer Busch-Hallen, Parul Christian, Kathryn Dewey, Shams El Arifeen, John Hoddinott, Klaus Kraemer, Roland Kupka, Saskia Osendarp, Anuraj H. Shankar, Emily Smith, Marleen Temmerman

Relevant Publications include:

- 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;1444(1):6–21. <https://nyaspubs.onlinelibrary.wiley.com/doi/full/10.1111/nyas.14121>

- Gomes F, Bourassa MW, Adu-Afarwuah S, et al. Setting research priorities on multiple micronutrient supplementation in pregnancy. *Annals of the New York Academy of Sciences*. 2019;n/a(n/a). doi:10.1111/nyas.14267 <https://nyaspubs.onlinelibrary.wiley.com/doi/10.1111/nyas.14267>
- Bourassa MW, Osendarp SJM, Adu-Afarwuah S, et al. Antenatal multiple micronutrient supplementation: call to action for change in recommendation. *Annals of the New York Academy of Sciences*. n/a(n/a). doi:10.1111/nyas.14271 <https://nyaspubs.onlinelibrary.wiley.com/doi/10.1111/nyas.14271>

Nutrition International (NI)*

NI has been working directly with governments in Africa and Asia to strengthen the foundation for maternal nutrition and IFAS programming over the last decade. Alongside government, NI has focused on building the components required for programmatic success for micronutrient supplementation during pregnancy, including budgeting and finance, policies, product and supply, delivery, evidence-informed behaviour change interventions and timely forecasting, ordering and distribution of stocks. This work, through health systems strengthening, has provided an opportunity to collectively understand what is needed to overcome barriers affecting IFAS coverage and adherence and foster sustainable scale-up of maternal health programmes in different contexts. Building on this experience and responding to requests from countries for more practical guidance on MMS particularly around the cost effectiveness of transitioning to MMS, NI has committed to advancing maternal nutrition, including supporting governments to translate evidence to action on MMS.

NI's Accelerator Commitment: 'The MMS Cost-Benefit Tool'. Launched in October 2019, the MMS Cost-Benefit Tool is an open access, user-friendly, online analytical tool that supports governments' use of country-specific data in their decision-making on whether investing in antenatal MMS rather than IFA is better value for money. The tool applies a rigorous methodology based on a study by NI and Limestone Analytics that was published in the *Journal of Nutrition*.²³ The simple to use tool can generate estimates for the health impact (stillbirth, neonatal mortality, pre-term birth, LBW, small for gestational age, maternal mortality and maternal anemia), number of Disability-Adjusted Life Year (DALY) averted, budget impact (cost), and benefit-cost ratio of transitioning to MMS from IFA. The tool is available for free on the [Nutrition International website](#), alongside pre-set analyses for 12 countries and a 'User Interface and Interpretation Guide'.

In the 12 country analyses, the findings showed with high certainty that MMS is very cost-effective, has a high return on investment, and leads to additional significant positive health outcomes for newborns compared with IFA. Countries can input their data to generate a customized analysis and adjust parameters such as population of pregnant women, coverage and supplement cost to build context-specific investment cases. The tool is being deployed widely as a public resource to facilitate the strategic use of data for policy decisions and investments concerning the introduction of MMS. For example, it's being used to inform decision making in India, Indonesia, South Africa, Madagascar, Pakistan, Tanzania, Burkina Faso and Bangladesh. The tool is intended to lead to more efficient use of resources, improvements in birth outcomes, and better overall health, survival and equality for women.

The information gained from the roll-out of this *MMS Cost-Benefit Tool* is also being disseminated at national and global forums, conferences, publications and meetings. NI currently has 27 LMIC Cost-Effective Analyses posted. At the request of the WHO, the MMS Cost-Benefit Tool was used to conduct additional analyses that were included in the evidence to-decision framework for updating the WHO recommendation on the use of MMS in pregnancy.

NI and UNICEF's Accelerator Commitment: Country Driven Decision Making for MMS. Both NI and UNICEF have an active presence in country and are committed to continuing to work with governments and their stakeholders to strengthen comprehensive maternal nutrition programming including the transition of MMS. NI and UNICEF are focused on supporting governments to make informed policy decisions and strengthen the enabling environment for sustainable maternal nutrition programming including the introduction of MMS. For example, NI conducted cost-effectiveness analyses to complement the operational studies supported by the BMGF and UNICEF, on MMS use in four countries: Bangladesh, Burkina Faso, Madagascar and Tanzania. Together NI and UNICEF aim to shift the global, regional and country-level discourse and policy landscape on MMS using new evidence, tools, and advocacy.

The Power of Nutrition

The Power of Nutrition is a charitable foundation that was launched at N4G conference in 2015 to leverage urgently needed increased funding to work at scale to prevent child undernutrition in Sub-Saharan Africa and Asia. The mandate is to focus on proven interventions for impact on nutrition, initially coming from evidence presented in the 2008/2013 Lancet series on Maternal and Child Nutrition.

In all programmes, as one part of a package of interventions, they support IFA supplementation supplied through the government system to pregnant women. In many programmes this is being expanded to include adolescent girls.

With increasing evidence and interest from implementing partners to move to MMS, The Power of Nutrition is now developing opportunities to test this to enable governments to make an informed decision as to whether and how they can make the transition from IFA to MMS.

Although WHO has not fully endorsed MMS there is widespread understanding in the context they work, that any potential risks in the formulation are outweighed by the benefits when compared to IFA. However there is concern about the affordability and sustainability in the short, medium and long term where governments will need to include the costs in their annual budgeting once donations cease.

The Power of Nutrition is well placed to work with partners and national governments to help with the transition and to achieve this at scale, but evidence gaps do still exist both in terms of safety, cost and ongoing supply.

Republic of the Union of Myanmar* (Myanmar)

Myanmar is a South-East Asian country with the 24th largest population. The country's under-5 mortality rate is now 44 per 1,000 live births, a significant reduction in the past two decades. There are indicators of undernutrition in the country, including a stunting rate of 29% and a 9% rate of low birthweight. With a crude birth rate of 17.7 and a population of over 55.6 million people, Myanmar has approximately 1,000,000 pregnancies each year.

The Ministry of Health and Sports (MOHS) for Myanmar are a *Healthy Mothers, Healthy Babies* Accelerator partner committed to implementing MMS as the antenatal standard of care for the country's health system, with the ultimate goal of reaching the entire population of pregnant women. Beginning in October of 2019, the MOHS has moved forward with its goal to scale-up MMS to reach 50% of the pregnant woman in Myanmar (approximately 500,000 women) by year three of this commitment (2022).

The goal of this commitment is to improve the Myanmar MOHS' understanding of how to deliver MMS to pregnant women to ensure effectiveness including (1) health workers adhere to the care standard; (2) women begin supplementation as early in gestation as possible; and (3) pregnant women adhere to the full dosage of supplementation. Ensuring that implementation is as effective as possible will increase the health benefits to women and their children. The goal of this commitment is to identify implementation strategies that are the most effective in increasing adherence within the health systems context.

The Myanmar MOHS is also in the process of executing a research project to improve the efficiency and effectiveness of MMS delivery by testing how packaging and presentation of MMS and improved counseling could improve program efficiency and effectiveness. This research will be co-led by investigators from the Myanmar MOHS and Harvard.

Since 1980, the Myanmar MOHS has supplied IFA for pregnant women in their iron deficiency control program. In 2016, Myanmar began a MMS consultation with UNICEF. In 2017, this was handed over to the MOHS and there were challenges in getting the supplement from outside Myanmar. In September of 2019, Myanmar received their first shipment of MMS from Kirk Humanitarian, which covered approximately 237,000 women (23-24% of pregnant women). Kirk Humanitarian and the Government of Myanmar are committed to a 5-year relationship supplying MMS to pregnant women, with the second shipment currently on its way to Myanmar.

Approximating that 70-75% of all pregnant women demand MMS and that 23-24% of the supply is currently met, the government is looking to find other sources to fill the gap for approximately 50% of women. They have already ordered a procurement of MMS from a local pharmaceutical manufacturer. As of 2018/2019 the local industry can manufacture MMS, and the MOHS can procure them if the MOHS orders them well in advance. The price of locally produced MMS is 2200 MMK (~ \$1.5 USD) for one bottle containing 100 tablets. However, there are some challenges in ensuring that MMS is prioritized among other health needs (immunizations, family planning) within the health budget.

Sight and Life*

Sight and Life is a global nutrition organization working to innovate towards eradicating all forms of malnutrition. Since 2008, SAL has been supporting JHU's community-based MMS distribution through the JiViTA trials in Bangladesh, which includes

local production of high-quality MMS. Sight and Life has also conducted research on production and procurement in 12 LMIC and uses global advocacy/policy research to build the case for MMS. SAL is contributing to an effectively functioning market for MMS that is characterized by the widespread and consistent use of high-quality MMS which are affordable, reliably delivered and readily available to all pregnant women in LMIC. In doing so, it leverages both technical expertise and financial resources to catalyze this ready-to-implement solution.

Sight and Life is working with key partners on MMS in several countries, including Bangladesh, South Africa, Indonesia, Madagascar, Burkina Faso, and Tanzania. In Bangladesh, Sight and Life is working with ClIFF to create the first-ever sustainable business model to ensure that quality MMS is made accessible and desirable to every pregnant woman in the country through pharmacy channels. Also in Bangladesh, along with Burkina Faso, Madagascar, and Tanzania, Sight and Life is mobilizing resources and expertise to undertake a situational analysis on the procurement and production of MMS, as well as formative research on adherence and uptake of MMS, as one of the partner organizations for UNICEF's demonstration pilots. To support decision-makers in 27 countries, they will conduct an MMS production and procurement analysis.

Sight and Life is leading purpose-driven global advocacy for MMS. At the global level, with the support of Kirk Humanitarian and FLRF, they are mobilizing resources toward the creation of a Special Report on MMS that will document the latest evidence, experiences, and resources for scale-up for key decision-makers in their countries and programs. This report will be digitally launched at the end of April 2020. SAL is a member of the MMS TAG convened by the NYAS and is committed to leveraging technical expertise to create buy-in for MMS at two high-impact conferences each year, from 2019-2023.

At the regional level, Sight and Life will lead advocacy efforts to re-introduce MMS into South Africa's EML through technical support, a peer-reviewed publication and an in-country workshop for government and key influencers. SAL also pledges to advance the evidence base for MMS by making additional research grants available for the Jivita trials in Bangladesh.

Summit Institute of Development (SID)

SID is an Indonesian NGO focused on local and global research and development through community engagement and collaboration with government, the private sector, and academic community. SID fosters equity in science and policy through participatory evidence-based decision-making and sustainable action at scale. Core areas of work include reduction of maternal and child mortality, child growth and cognitive development, nutrition, and infectious disease detection treatment. SID emphasizes modern and innovative approaches to challenging and unsolved problems in public health to catalyze sustainable and resilient systems to accelerate human development. This includes human resource development via novel knowledge- and practice-based training of professionals from LMIC, and creation of information technology systems such as the OpenSRP, a globally deployed front line mobile information system co-founded by SID. Large scale randomized trials and programmatic interventions at scale are core capabilities, and their work has led to local, national and global impact on policy and practice.

Beginning in 2020, SID and local and global partners will deploy its intervention known as ANCS. With ANCS the OpenSRP decision-support and client record system will be scaled to 20 districts covering over 15 million persons, and enable client-centered care delivery by coordinated teams comprised of midwives and multiple cadres of community health workers. The innovative approach of ANCS allows real-time cross cadre information sharing to ensure continuity of care with high coverage and quality, including monitoring and demand-side client incentives, and integration with universal health coverage. While ANCS addresses the Indonesian context with a population of over 270 million spread over 17,000 islands and 514 districts, its systems apply to most LMIC where frontline workers can be optimized for high impact.

UNICEF*

UNICEF's activities include generating demand for MMS, increasing global supplier base and availability of quality MMS supplies; and building operational experiences.

1. Generating demand for MMS.

- UNICEF's vision is that MMS is integrated as part of a comprehensive, systems strengthening approach to improving the diets, practices, and services for all women in UNICEF's *new* Nutrition Strategy (2020-2030). The goal is to build operational experiences on MMS use across countries to inform country scale up.
- UNICEF-supported MMS distribution in over 20 countries in 2017-2018. Moreover, in 2019, UNICEF initiated MMS programming in 4 high-burden countries of Asia and sub-Saharan Africa (Bangladesh, Burkina Faso, Madagascar and Tanzania) as part of an approach to strengthen antenatal care and community-based delivery platforms.

- Discussions are ongoing to introduce MMS in 3-5 additional countries (2020) with a high prevalence of nutritional deficiencies. This approach focuses on partnerships with governments using systems strengthening approaches at national or sub-national levels.
2. Increasing global supplier base and availability of quality MMS supplies.
 - MMS is an established product in UNICEF's Supply Catalog. Since 2006, UNICEF has procured over 2.5 billion MMS tablets.
 - UNICEF has 2 approved suppliers supplying MMS in various pack sizes and will soon introduce blister packs in customized languages and labels.
 - UNICEF has undertaken market assessment activities to increase access to low-cost, high-quality MMS and support innovations – such as through improved packaging – to improve women's adherence to supplementation recommendations.
 - In 2019, a global tender was launched to identify additional MMS suppliers with a focus on LMIC. Over 60 MMS suppliers responded. In addition to identifying new qualified sources for MMS, the tender explored the potential for different packaging formats.
 - Efforts are ongoing with Sight and Life to establish local MMS production in 2 countries and formative research on women's preferences and packaging in 4 countries.
 - A global MMS forecasting exercise is ongoing to consolidate MMS forecasts (January 2020).
 3. Building operational experiences.
 - Measurement and documentation are an important part of UNICEF-supported MMS programming and are intended to yield key information on what constitutes successful MMS programming.

United States Agency for International Development (USAID)

Improving women's access to comprehensive, quality nutrition services and counseling during reproductive, antenatal, and postpartum care is a central component of USAID's investments in maternal and child nutrition. Recent work supported by USAID through the SPRING project and Maternal and Child Survival program (MCSP) include developing a method for rapid assessment of the strengths and weaknesses of IFA supplement distribution and consumption in ANC programs through secondary analysis of Demographic and Health Survey (DHS) data as well as reviewing key strengths and barriers of a community-based distribution model for IFA. Building on past nutrition investments, in September 2018, USAID launched USAID Advancing Nutrition, the Agency's flagship multi-sectoral nutrition project, that draws together global nutrition experience to design, implement, and evaluate programs that address the root causes of malnutrition. USAID Advancing Nutrition strives to fulfill 3 primary goals: 1. Scale-up high-impact nutrition interventions and services; 2. Strengthen country commitment and capacity for multi-sectoral nutrition programming; and 3. Generate evidence and facilitate learning and innovation for improved nutrition.

Vitamin Angels (VA)*

VA is a 501(c) 3 tax-exempt organization, incorporated in the State of California (1998) and headquartered in Santa Barbara, California. VA operates globally in coordination with partners (i.e., governments and NGOs in 70+ countries throughout Africa, Asia, Latin America, North America including the U.S. and Canada, and in the U.K.

Cause: VA is a public health nutrition organization that works to reduce health and economic disparities across the lifespan of underserved populations by effecting delivery of evidence-based nutrition interventions among hard-to-reach populations globally. They focus on filling gaps in coverage for interventions that target the first 1,000 days of life (i.e., from conception through 24 months of age) and children up to five years of age.

What VA does: To alleviate health and economic disparities, VA collaborates with health systems to initiate nutrition services or add to their existing health and nutrition services. Starting with the premise that there are different categories of evidence-based nutrition interventions (e.g., supplemental feeding, commercial fortification, supplementation, combating childhood infections, and promotion of optimal IYCF practices); they work to expand the availability of these evidence-based nutrition interventions to hard-to-reach populations.

How VA delivers results: VA uses its resources to (1) raise awareness to and advocate for evidence-based interventions, (2) provide technical advisory services to effect policy change, and (3) provide technical assistance and product to partners to facilitate launching or strengthening of specific nutrition services. Their partners must have a capacity to design, staff, and execute their own service delivery programs and agree to absorb all local implementation costs.

Focus areas: VA focuses on strengthening, sustaining, or expanding MMS for pregnant women, high-dose vitamin A supplementation for children under five, deworming for children under five, and IYCF.

MMS-specific activities: VA has worked as a leading participant in efforts to accelerate the use of MMS, and become a valued partner able to complement the capacity of other organizations working to introduce MMS services. VA has also established itself as a leading provider of technical advisory services and technical assistance to selected governments supporting MMS initiatives.

Within its MMS focus area, VA's work focuses on: (1) advocacy and advisory services to: raise awareness to the benefits of MMS use; advocate for the use of MMS in place of IFA, facilitate MMS policy adoption; and (2) provide technical assistance in the form of learning solutions, implementation research services, and monitoring and evaluation solutions that support initiatives that grow MMS coverage among pregnant women.

MMS-related accomplishments: Over the past several years, VA has accelerated the access, availability, and use of MMS for pregnant women by establishing itself as a leading and valued partner working to:

- Ensure a global supply of MMS by working with key partners to: (1) support efforts to develop an open-access MMS product specification that can result in an affordable MMS product produced to internationally accepted quality standards; (2) create a donatable, annual product supply of up to 5 million, 180 count bottles of UNIMMAP-MMS product to facilitate MMS introduction; and (3) establish an initial capacity to assist manufacturers to enter into local manufacturing of UNIMMAP-MMS product.
- Create demand for MMS by participating in and co-chairing internationally recognized meetings (e.g., the Women Deliver Conference and the ACN) that raise awareness for MMS, advocate for uptake of MMS, and advance effort needed to support MMS policy and implementation. In conjunction with these initiatives, VA participates in and convenes technical consultations to support policy formation and planning.
- Influence policy and effective programing by conducting implementation research in Haiti to inform the introduction and scaling of MMS within national programs with a focus on developing a replicable approach to developing behavior change communications that help to strengthen adherence to MMS use.
- Support delivery of services to over 2 million pregnant women in 2019 through a network of over 1,200 partners (including 20 governments and NGO field partners in 60 countries). For NGOs, this includes provision of technical assistance to establish an MMS intervention within VA's partners' ANC services and supplying them with a high-quality MMS product. For governments, this includes all they provide to NGOs plus more advanced technical advisory services.
- Act as a catalyst to mobilize governments and other organizations into action to participate in the introduction and scaling of MMS. Examples include a series of technical consultations with the Ministry of Public Health (MSP) in the Dominican Republic to support their exploration of MMS as part of their newly launched national strategy for reducing infant and maternal mortality. Following these consultations, VA provided a supply of MMS for approximately 1,000 women who will receive MMS as part of MSP's pilot "companion program". VA has also engaged key stakeholders in Indonesia to advance the creation of an MMS policy. After co-sponsoring a symposium at the ACN, VA helped convene technical consultations and expert meetings to help generate consensus regarding a recommendation pertaining to the adoption of an MMS policy. This has resulted in consensus regarding current findings related to MMS use in Indonesia, consensus regarding a recommendation that leads to the formation of MMS policy, and the development of an Indonesian MMS Taskforce to support policy adoption.

World Bank

Over the last decade, the World Bank has been a major contributor to dialogue and action on scaling up actions to prevent stunting. The seminal report 'Repositioning Nutrition as Central to Development' brought attention to the issue among key partners and governments. The follow-on 2010 World Bank publication 'Scaling Up Nutrition: What Will It Cost?' provided the world with the first estimates of global nutrition costs, and the SUN launched in 2010 rallied partners around the cause.

Guided by the twin goals of ending extreme poverty and boosting shared prosperity, the World Bank's commitment to investing in the early years of life (early nutrition, early learning and stimulation, and nurturing care and protection from stress) is necessary to build human capital. To date, the World Bank's investments in nutrition have grown dramatically since 2010, and new resources have been made available to support this agenda at both global and national levels—from partners such as BMGF, CIFF, the Japan Trust Fund for Scaling Up Nutrition—which is focused on high-malnutrition burden country

programs, the Dangote Foundation, Tata Trusts, the Power of Nutrition, and the GFF. These and many other partners, including civil society organizations and Parliamentarians, have been working to catalyze further commitment in support of the SDGs.

The World Bank has led the effort to estimate the cost and cost-effectiveness of nutrition interventions to support advocacy and increase investment in nutrition at the global and country levels. At the global level, the World Bank, in partnership with Results for Development, 1,000 Days, BMGF, and CIFF published 'An Investment Framework for Nutrition' which provides a roadmap, including estimates of resources required and possible financing scenarios to achieve the global nutrition targets set out by the WHA and enshrined in the SDGs.

At the country level, the World Bank has conducted a number of studies to support governments in Sub-Saharan Africa and South Asia to plan for and scale up investments in nutrition. The studies provide estimates of the financing needs, impacts and benefits of scaling up a package of evidence-based nutrition interventions proven to improve nutrition outcomes during the first 1,000 days of a child's life—starting from pregnancy to a child's second birthday. The studies consider the current coverage of interventions, available delivery platforms, and unit costs for commodities, monitoring and evaluation, and capacity building. As of January 2017, scale-up studies have been completed for Cote d'Ivoire, Democratic Republic of Congo, Guinea-Bissau, Kenya, Madagascar, Mali, Nigeria, Togo, Uganda and Zambia. Analytic work is underway for Afghanistan and Bangladesh.

In 2020, the Government of Japan will host the next N4G global summit to mobilize and generate commitments from bilateral donors, philanthropies, domestic governments and Civil Society Organizations. The key focus of the N4G summit will be more effective and sustainable financing for nutrition, including synergistic efforts on domestic financing and more catalytic/innovative financing solutions to scale up high-impact interventions, supported by data systems to track nutrition financing and results.

World Food Programme (WFP)

Assisting 86.7 million people in around 83 countries each year, the WFP is the leading humanitarian organization saving lives and changing lives, delivering food assistance in emergencies and working with communities to improve nutrition and build resilience. WFP's development projects focus on nutrition, especially for mothers and children, addressing malnutrition from the earliest stages through programmes targeting the first 1,000 days from conception to a child's second birthday, and later through school meals.

WFP is a UN agency that collaborates with other UN agencies to address micronutrient malnutrition. WFP is primarily focused on food, which includes food fortification and Specialized Nutritious Foods, implemented through food and social protection systems and other agencies such as UNICEF on health sector-based interventions, including MMN supplementation. While WFP does address micronutrient deficiencies through LNS-Small Quantity and MNP, they only distribute MMN directly in case government or other partners do not have the capacity or reach to cover the intended target population.

The Fill the Nutrient Gap (FNG) is a multi-sectoral analysis focusing on the gaps in nutrient intake, taking into account availability, physical access and affordability of nutritious foods. It seeks to identify context-appropriate interventions to fill the gap in nutrient intake for specific target groups. It has two main components: an extensive secondary data review and a Cost of the Diet (CotD) analysis using the CotD software developed by Save the Children. By using CotD, WFP calculates the combination of locally-available foods that for the lowest possible cost fill the nutrient requirements of a model household. Once WFP obtains the cost of a nutritious diet, they model interventions to observe their impact on the cost and affordability of the nutritious diet.

The following FNG analyses modeled IFA and MMS for an Adolescents Girl and a Lactating Woman. As the summary reports highlight, the modeling results show that MMS help reduce the cost of a nutritious diet and provide an important contribution to micronutrient intake in these contexts, when compared to IFA supplements. This has sparked or contributed to the discussions in the health sector on whether the use of IFA supplementation should be replaced by MMS. It has also helped with the understanding of this information from stakeholders outside of the health sector. In addition to the documents highlighted below, there is information on the FNG on WFP's [webpage](#) and [article](#) about the FNG methodology published in Maternal & Child Nutrition last year.

- Uganda, National Analysis: https://docs.wfp.org/api/documents/WFP-0000108062/download/?_ga=2.218231385.1331908036.1579602447-1507840975.1560158470

- Uganda, Karamoja Region Analysis: https://docs.wfp.org/api/documents/WFP-0000108065/download/?_ga=2.187881064.1331908036.1579602447-1507840975.1560158470
- Uganda, Refugee Settlements Analysis: https://docs.wfp.org/api/documents/WFP-0000108066/download/?_ga=2.218231385.1331908036.1579602447-1507840975.1560158470
- Rwanda, Refugee Settlements Analysis: https://docs.wfp.org/api/documents/WFP-0000107045/download/?_ga=2.184614121.1331908036.1579602447-1507840975.1560158470
- Sri Lanka, National Analysis: https://docs.wfp.org/api/documents/WFP-0000103325/download/?_ga=2.184614121.1331908036.1579602447-1507840975.1560158470
- Tajikistan, National Analysis: https://docs.wfp.org/api/documents/WFP-0000099222/download/?_ga=2.184614121.1331908036.1579602447-1507840975.1560158470
- Philippines, National Analysis: https://docs.wfp.org/api/documents/WFP-0000103298/download/?_ga=2.242423746.1331908036.1579602447-1507840975.1560158470
- Mozambique, National Analysis: https://docs.wfp.org/api/documents/WFP-0000100126/download/?_ga=2.242423746.1331908036.1579602447-1507840975.1560158470
- Lesotho, National Analysis: https://docs.wfp.org/api/documents/WFP-0000107436/download/?_ga=2.242423746.1331908036.1579602447-1507840975.1560158470

World Vision

World Vision is a Christian humanitarian organization dedicated to working with children, families, and their communities worldwide to reach their full potential by tackling the causes of poverty and injustice. World Vision serves all people, regardless of religion, race, ethnicity, or gender. Established in 1950, World Vision operates in nearly 100 countries with oversight, fundraising, and implementation branches. Nearly 40,000 staff members (95 percent of whom work in their own countries) work in health, education, livelihoods, food security, child protection, WASH, and economic development programs. WV is an active leader in the global movement of advancing nutrition for vulnerable populations, including involvement at the country-level in the SUN movement, and is committed to the N4G targets.

World Vision implements multi-sectoral nutrition programs across the world, including significant support for vitamin A and deworming among young children. Most of the organization's micronutrient history for pregnant women has been with IFA, but in light of the research findings on MMN, they have identified MMS as an important area for growth. While World Vision does not intend to address the supply challenges on the global landscape of micronutrient supplementation, they are poised to be active in advocacy with governments to encourage demand and implementation research to understand access, marketability, care-seeking behaviors, and delivery platforms. World Vision is also interested in exploring women-centered design for MMS, ensuring that women are active voices at the table in determining the most effective and acceptable ways to adopt MMN at scale.

World Vision has growing partnerships with several key organizations in the micronutrient sector, including Sight and Life, VA, and Power of Nutrition. World Vision is undergoing active conversations with several stakeholders to explore how implementation can begin in early 2020. Zambia has become a country of particular interest for World Vision for expanding into the realm of MMS implementation. This is in part due to World Vision's history of working with the Zambia MOH, the stable political environment, and other strategic funding opportunities.

References



References

1. World Health Organization, World Food Programme, United Nations Children's Fund. Preventing and controlling micronutrient deficiencies in populations affected by an emergency 2007.
https://www.who.int/nutrition/publications/WHO_WFP_UNICEFstatement.pdf. Accessed January 18, 2020.
2. World Health Organization. *Guideline: Daily Iron and Folic Acid Supplementation in Pregnant Women*. Geneva: WHO; 2012.
<http://www.ncbi.nlm.nih.gov/books/NBK132263/>. Accessed January 18, 2020.
3. Peña-Rosas JP, Viteri FE. Effects and safety of preventive oral iron or iron+folic acid supplementation for women during pregnancy. *Cochrane Database Syst Rev*. 2009;(4). doi:10.1002/14651858.CD004736.pub3.
4. World Health Organization. WHO recommendations on postnatal care of the mother and newborn 2013.
https://apps.who.int/iris/bitstream/handle/10665/97603/9789241506649_eng.pdf?sequence=1. Accessed January 18, 2020.
5. World Health Organization. WHO recommendations on antenatal care for a positive pregnancy experience 2016.
<https://apps.who.int/iris/bitstream/handle/10665/250796/9789241549912-eng.pdf?sequence=1>. Accessed January 15, 2020.
6. Haider BA, Bhutta Z. Multiple-micronutrient supplementation for women during pregnancy. *Cochrane Database Syst Rev*. 2015;(11). doi:10.1002/14651858.CD004905.pub4.
7. World Health Organization. Global database on implementation of nutrition action (GINA) 2019.
<https://www.who.int/nutrition/gina/en/>. Accessed January 20, 2020.
8. About. Women Deliver 2019 Global Conference. <https://wd2019.org/about-2019-conference/>. Accessed January 22, 2020.
9. Tuesday 4 June Schedule. Women Deliver 2019 Global Conference. <https://wd2019.org/schedule/?date=4+June>. Accessed January 22, 2020.
10. Welcome. ACN 2019. <https://acn2019.org/welcome/>. Accessed January 22, 2020.
11. Oral Presentation Schedule. ACN 2019. <https://acn2019.org/oral/>. Accessed January 22, 2020.
12. Poster Presentation Schedule. ACN 2019. <https://acn2019.org/poster/>. Accessed January 22, 2020.
13. Micronutrient Forum. Healthy Mothers, Healthy Babies: A 2019 Goalkeepers Accelerator with the Bill & Melinda Gates Foundation. Internal Powerpoint.
14. About the Conference. Micronutrient Forum 5th Global Conference 2020.
<https://conference.micronutrientforum.org/general-information/about-the-conference/>. Accessed January 22, 2020.
15. Micronutrient Forum. Multiple Micronutrient Supplement Activities during the Micronutrient Forum 5th Global Conference, 23-27 March 2020, Bangkok, Thailand. Internal Document.
16. Tokyo Nutrition for Growth Summit 2020. Vision and Roadmap. August 2019. <https://nutritionforgrowth.org/wp-content/uploads/2019/12/Nutrition-for-Growth-2020-Vision-and-Roadmap.pdf>. Accessed January 22, 2020.
17. The Multiple Micronutrient Supplement Technical Advisory Group (MMS-TAG). Expert Consensus on an Open-Access United Nations International Multiple Micronutrient Antenatal Preparation (UNIMMAP) - Multiple Micronutrient Supplement (MMS) Product Specification. Annals of the New York Academy of Sciences; Special Issue: Annals Reports, Technical Report. March 2020 (in press).
18. Ajello CA. Multiple Micronutrient Supplements (MMS) for Pregnant Women: Immediate and Long-Term Supply of MMS for National Programs (including Local Sourcing/Manufacturing). 2020. (in press).

19. Kapner H. Task Force on Multiple Micronutrient Supplementation in Pregnancy, Meeting 2. The New York Academy of Sciences. 2018. Internal Document.
20. Monterossa EC, Beesabathuni K, van Zutphen KG, et al. Situation analysis of procurement and production of multiple micronutrient supplements in 12 lower and upper middle-income countries. *Matern Child Nutr*. 2018;14(S5): e12500. doi: 10.1111/mcn.12500.
21. Gomes F, Bourassa MW, Adu-Afarwuah A, et al. Setting research priorities on multiple micronutrient supplementation in pregnancy. *Ann N Y Acad Sci*. 2019. doi: 10.1111/nyas.14267.
22. 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 Nutr*. 2019;149(7):1222-1229. doi:10.1093/jn/nxz052.
23. MMS Cost-Benefit Tool. Nutrition International. <https://www.nutritionintl.org/knowledge-centre/mms-cost-benefit-tool/>. Accessed January 22, 2020.
24. United Nations Department of Economic and Social Affairs, Population Division. "Overall total population" – World Population Prospects: The 2019 Revision" (xlsx). *population.un.org* (custom data acquired via website). Accessed January 17, 2020.
25. United Nations Development Programme. Human Development Report 2019. <http://hdr.undp.org/sites/default/files/hdr2019.pdf>. Accessed January 18, 2020.
26. United Nations Development Programme. Human Development Report 2009. http://hdr.undp.org/sites/default/files/reports/269/hdr_2009_en_complete.pdf. Accessed January 18, 2020.
27. 2010 Haiti earthquake: Facts, FAQs, and how to help. World Vision. <https://www.worldvision.org/disaster-relief-news-stories/2010-haiti-earthquake-facts>. Updated November 25, 2019. Accessed January 18, 2020.
28. Institut Haïtien de l'Enfance (IHE) et ICF. Enquête Mortalité, Morbidité et Utilisation des Services (EMMUS-VI 2016-2017). <https://www.dhsprogram.com/pubs/pdf/FR326/FR326.pdf>. Published July 2018. Accessed January 18, 2020.
29. The United Nations Children's Fund. Haiti Factsheets. <https://www.unicef.org/haiti/media/626/file/Fact-Sheet-f%C3%A9vrier-2019.pdf>. Published February 2019. Accessed January 18, 2020.
30. United States Agency for International Development. Haiti: Nutrition Profile. <https://www.usaid.gov/sites/default/files/documents/1864/Haiti-Nutrition-Profile-Mar2018-508.pdf>. Updated February 2018. Accessed January 18, 2020.
31. Antenatal care. UNICEF DATA. <https://data.unicef.org/topic/maternal-health/antenatal-care/>. Updated October 2019. Accessed January 20, 2020.
32. Mirkovic KR, Lathrop E, Hulland EN, et al. Quality and uptake of antenatal and postnatal care in Haiti. *BMC Pregnancy Childbirth*. 2017;17. doi:10.1186/s12884-016-1202-7.
33. Fiedler J, D'Agostino A, Sununtnasuk C. Nutrition Technical Brief: A Rapid Initial Assessment of the Distribution and Consumption of Iron-Folic Acid Tablets through Antenatal Care in Haiti. USAID/Strengthening Partnerships, Results and Innovations in Nutrition Globally (SPRING) Project. <https://www.spring-nutrition.org/publications/briefs/iron-folic-acid-assessment-haiti>. Published September 26, 2014. Accessed January 20, 2020.
34. Wang W, Benedict RK, Mallick L. The Role of Health Facilities in Supporting Adherence to Iron-Folic Acid Supplementation during Pregnancy: A Case Study Using DHS and SPA Data in Haiti and Malawi. *DHS Working Paper*. 2019;160. <https://www.dhsprogram.com/pubs/pdf/AB6/WP160.pdf>. Accessed January 20, 2020.

35. République d’Haïti Ministère de la Santé Publique et de la Population. Plan Directeur de Santé 2012-2022. <https://www.mindbank.info/item/5438>. Published October 2013. Accessed January 18, 2020.
36. République d’Haïti Ministère de la Santé Publique et de la Population. Plan Stratégique de Nutrition 2013-2018. https://scalingupnutrition.org/wp-content/uploads/2013/06/Haiti_Plan-Strategique-Nutrition-2013-2018.pdf. Published February 2013. Accessed January 18, 2020.
37. Scaling Up Nutrition. Haiti Country Report 2019. https://scalingupnutrition.org/wp-content/uploads/2019/10/SUN_Report_EN_2019_Country_Haiti.pdf. Accessed January 18, 2020.
38. Haiti. UNICEF. <https://www.unicef.org/appeals/haiti.html>. Updated December 3, 2019. Accessed January 20, 2020.
39. King SE, Harvey Q, Ajello C, Dacius M, Marhone-Pierre J, Hurkey K. Increasing adherence to MMS among pregnant women in Haiti: Experiences using *Sight and Life’s* process for designing behavior change programs. *Sight and Life*. 2020;34(1):94-98 (in press).
40. Dacius M, King SE, Harvey Q, Ajello C, Marhone-Pierre J, Hurley, KM. Ensuring effective implementation of Multiple Micronutrient Supplementation (MMS) for Pregnant Women in Haiti. *Sight and Life*. 2020 (in press).
41. Agustina R, Dartanto T, Sitompul R, et al. Universal health coverage in Indonesia: concept, progress, and challenges. *Lancet*. 2019;393(10166):75-102. doi:10.1016/S0140-6736(18)31647-7.
42. Wikipedia contributors. Indonesia. Wikipedia, The Free Encyclopedia. January 13, 2020, 07:48 UTC. Available at: <https://en.wikipedia.org/w/index.php?title=Indonesia&oldid=935551833>. Accessed January 19, 2020.
43. The Supplementation with Multiple Micronutrients Intervention Trial (SUMMIT) Study Group. Effect of maternal multiple micronutrient supplementation on fetal loss and infant death in Indonesia: a double-blind cluster-randomised trial. *Lancet*. 2008;f1(9608):215-227. doi:10.1016/S0140-6736(08)60133-6.
44. Shankar AV, Asrilla Z, Kadha JK, et al. Programmatic effects of a large-scale multiple micronutrient supplementation trial in Indonesia: Using community facilitators as intermediaries for behavior change. *Food Nutr Bull*. 2009;30(2):S207-S214. <https://journals.sagepub.com/doi/pdf/10.1177/15648265090302S204>. Accessed January 18, 2020.
45. Prado EL, Sebayang SK, Apriatni M, et al. Maternal multiple micronutrient supplementation and other biomedical and socioenvironmental influences on children’s cognition at age 9–12 years in Indonesia: Follow-up of the SUMMIT randomised trial. *Lancet Glob Health*. 2017;5(2):E217-E228. [https://www.thelancet.com/journals/langlo/article/PIIS2214-109X\(16\)30354-0/fulltext](https://www.thelancet.com/journals/langlo/article/PIIS2214-109X(16)30354-0/fulltext). Accessed January 18, 2020.
46. Steets A, Ajello C, Dacius M, et al. Experiences supporting the introduction and implementation of MMS for pregnant women globally. *The Sight and Life Magazine*. (in press).
47. Keats EC, Haider BA, Tam E, Bhutta ZA. Multiple-micronutrient supplementation for women during pregnancy. *Cochrane Database Syst Rev*. 2019;(3). doi:10.1002/14651858.CD004905.pub6.
48. Smith ER, Shankar AH, Wu LS-F, 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(11):e1090-e1100. doi:10.1016/S2214-109X(17)30371-6.
49. Bourassa MW, Osendarp SJM, Adu-Afarwuah S, 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;1444(1):6-21. doi:10.1111/nyas.14121.
50. 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 NY Acad Sci*. 2019;1444(1):35-51. doi:10.1111/nyas.14132.

51. Horton S, Levin C. Cost-effectiveness in interventions for reproductive, maternal, neonatal, and child health. In: Black R, Laxminarayan R, Temmerman M, Walker N, ed. *Reproductive, Maternal, Newborn, and Child Health Disease Control Priorities*. 3rd ed. Washington, D.C.: International Bank for Reconstruction and Development/The World Bank; 2016.
52. Summit Institute of Development. <https://sid-indonesia.org>. Accessed January 18, 2020.
53. Global Financing Facility and partners announce winners of innovation awards to save the lives of women, children and adolescents [press release]. Washington DC: Global Financing Facility; December 19, 2019. <https://www.globalfinancingfacility.org/global-financing-facility-and-partners-announce-winners-innovation-awards-save-lives-women-children>. Accessed January 22, 2020.
54. Siekmans K, Roche M, Kung'u JK, Desrochers RE, De-Regil LM. Barriers and enablers for iron folic acid (IFA) supplementation in pregnant women. *Matern Child Nutr*. 2018;14:e12532. doi:10.1111/mcn.12532.
55. United Nations Children's Fund (UNICEF), World Health Organization, International Bank for Reconstruction and Development/The World Bank. Levels and trends in child malnutrition: key findings of the 2019 Edition of the Joint Child Malnutrition Estimates. <https://data.unicef.org/resources/jme/>. Published April 2019. Accessed February 20, 2020.
56. Global Affairs Canada. Canada's Feminist International Assistance Policy. https://www.international.gc.ca/world-monde/issues_development-enjeux_developpement/priorities-priorites/policy-politique.aspx?lang=eng. Published February 21, 2017. Accessed January 30, 2020.

Annex

Policies Including Recommendations and/or Action Items on Micronutrient Supplementation

Organization / Country Policy Name Years Active	Policy Includes:	
	Multiple Micronutrient Supplementation (MMS) or Unspecified Micronutrient Supplementation	Iron / Folic Acid (IFA) Supplementation
WHO <u>Joint statement by the World Health Organization, the World Food Programme and the United Nations Children's Fund: Preventing and controlling micronutrient deficiencies in populations affected by an emergency</u> 2007 - Present	<p>"Pregnant and lactating women should be given this supplement providing one recommended nutrient intake (RNI) of micronutrients daily, whether they receive fortified rations or not. IFA supplements, when already provided, should be continued. The MMN supplements should be given until the emergency is over and access to nutrient rich foods is restored. At this time the micronutrient status of the population should be assessed to decide whether further interventions to prevent and control micronutrient deficiencies are needed."</p>	
WHO <u>WHO recommendations on antenatal care for a positive pregnancy experience</u> 2016 - Present	<p>"Recommendation A.6: Multiple micronutrient supplementation is not recommended for pregnant women to improve maternal and perinatal outcomes."</p>	<p>"Recommendation A.2.1: Daily oral IFA supplementation with 30 mg to 60 mg of elemental iron and 400 µg (0.4 mg) folic acid is recommended for pregnant women to prevent maternal anemia, puerperal sepsis, low birth weight, and preterm birth."</p>
Bangladesh <u>Health Population & Nutrition Sector Development Plan (HPNSDP)</u> 2011-2016		<p>"National Nutrition Service: Providing micronutrient supplementation to pregnant women (Iron folate), and Vitamin-A supplementation to mothers and neonates at postnatal period."</p>
Belize <u>United Nations Development Assistance Framework Belize</u> 2013-2016		<p>"Output 2.3. Increase coverage and quality of maternal and child care with emphasis on vulnerable groups (UNICEF, PAHO/WHO, UNFPA, IAEA, WFP, UNAIDS): Number of iron folate or micronutrient supplementation programs for prevention of iron folate deficiency in pregnant and lactating women."</p>
Cambodia <u>National Nutrition Strategy</u> 2009-2015	<p>"Since pregnant women in Cambodia suffer from multiple nutrient deficiencies – not only iron and vitamin A, a policy on the provision of MMN pregnancy supplements instead of the present IFA tablets might be considered, at least in provinces with high rates of vitamin A deficiency."</p>	<p>"In addition, there might be a need to review the policy on iron/folate supplements during pregnancy as the present recommendation of 90 tablets during pregnancy is short compared to the global recommendation of 180 tablets."</p>
Cameroon <u>Plan National de Développement Sanitaire</u> 2011-2015	<p>"2.8 MMS during pregnancy" Phase 1 (2011-2013) - 65% Phase 2 (2013-2015) - 80%</p>	<p>"Maternal health: focused ANC and PNC consultation: micronutrient supplementation (iron, folic acid, calcium, etc.)"</p>
China <u>The National Nutrition Plan</u> 2017-2030		<p>"The project on folic acid supplementation among women in rural areas to prevent neural tube defects shall be implemented continuously; and strengthen supplementation of folic acid, iron, and other micronutrients in pregestational and pregnant women to reduce the prevalence of anemia among pregnant women and to prevent nutritional deficiencies among children."</p>
Ethiopia <u>National Nutrition Programme</u> 2016-2020		<p>"Provide pregnant and lactating women with routine IFA supplementation."</p>

Gambia <u>National Nutrition Policy</u> 2010-2020	<p>“4.4.2 Support the implementation of appropriate micronutrient supplementation programmes for the identified groups at risk (pregnant and lactating mothers, infant and young children, and other vulnerable groups)”</p>	
Guinea-Bissau <u>Politique Nationale de Nutrition</u> 2014-2025		<p>“Prevention of micronutrient deficiencies, in particular: IFA supplementation of pregnant and breastfeeding women.”</p>
Kenya <u>National Nutrition Action Plan</u> 2012-2017	<p>“2.4.3 Strategic Objective 3: To reduce the prevalence of micronutrient deficiencies in the population: Strengthen the national micronutrient supplementation program; Strengthen monitoring and evaluation systems for the micronutrient strategies”</p>	
Madagascar <u>Plan National D'Action Pour La Nutrition II</u> 2012-2015	<p>“Axe 1/ Intervention 7- Micronutrient supplementation: 90% of pregnant and lactating women supplemented with IFA and/or other micronutrients.”</p>	<p>“Axe 1/ Intervention 7- Micronutrient supplementation: 90% of pregnant and lactating women supplemented with IFA and/or other micronutrients.”</p>
Maldives <u>Health Master Plan</u> 2016-2025		<p>“OP 5: Enabled a healthy start in life and childhood: % of pregnant women who receive iron-folate supplements during pregnancy (Iron folate supplements coverage).”</p>
Mauritania <u>Plan National de Developpement Sanitaire</u> 2012-2020		<p>“Iron and other micronutrient supplementation for pregnant women and breastfeeding as a part of prenatal care, and more than 95% of pregnant women who are anemic.”</p>
Mongolia <u>National Programme on Nutrition</u> 2015-2025	<p>“4.2.1.Promote healthy diet for mothers and children, and provide young children with age-appropriate and safe complementary foods: provide MMS for pregnant women, children aged 6-23 months, high dose vitamin A supplementation for children aged 6-59 months, and high dose vitamin D supplementation for children aged 0-36 months.”</p>	
Morocco <u>La Stratégie Nationale de la Nutrition</u> 2011-2019	<p>“Reinforce the strategy on national micronutrient supplementation 15) Update and synchronize national calendar of micronutrient supplementation. 16) Improve the methods of management and supply of micronutrients.”</p>	
Mozambique <u>Plano Estratégico do Sector da Saúde Sector Strategic Plan</u> 2014-2019	<p>“The health sector has been implementing several other initiatives dedicated to nutrition, such as the “child-friendly hospital,” supplementation with ferrous salt, iodine, deworming, administration of MMN to children, pregnant women and adolescents.”</p>	

Nepal
Multisector Nutrition Plan
2013-2017

“The government, in many cases with support of development partners, is implementing a number of programmes that could impact on nutrition. These range from direct or nutrition ‘specific’ programmes such as micronutrient supplements to children under five, to women during pregnancy and lactation.”

Nicaragua
Plan Plurianual de Salud
2011-2015

“Promote interventions to raise awareness among parents and the population in general of the need to preserve health from the beginning of life, including vaccination to prevent diseases as well as deworming and vitamin supplementation with micronutrients”

Panama
Plan Nacional de Seguridad Alimentaria y Nutrición
2009-2015

“Ensure that pregnant mothers are treated at the Ministry of Health facilities so they give birth with an adequate weight and without anemia; deliver IFA supplements to pregnant women at their first consultation and counseling to ensure their consumption.”

Rwanda
National Food and Nutrition Policy
2013-2018

“IFA supplements are available to all pregnant women through ANC services. However, the 2010 Rwanda Demographic Health Survey found that only about 1% of women had used Iron/IFA supplements for 90 days during their last pregnancy as is the recommendation from WHO. Broader and more effective Iron/IFA supplementation among pregnant women requires that supplies be available in health facilities, mothers attend early antenatal clinics, and health staff provide the supplements to every pregnant woman and those women taken them daily as directed.”

Micronutrient Forum
1201 Eye Street, NW
Washington, DC 20005-3915 USA
info@micronutrientforum.org

