



An enabling policy environment for multiple micronutrient supplementation: Lessons from Bangladesh

July 2024

CASE STUDY

SUMMARY

This case study explores the processes and key actors behind the successful integration of multiple micronutrient supplements (MMS) for pregnant women into Bangladesh's public health strategies and policies. It outlines the steps taken, including creating technical guidelines and engaging stakeholders to address concerns. The study highlights the influence of evidence from MMS trials on national strategies. It also emphasizes the roles of high-level political leaders, mid-level bureaucrats, scientists, and grass-roots implementers. Key factors in the success included leveraging evidence-based recommendations, collaboration platforms, global guidance, lessons from past experiences, and empowering advocates. Ethical considerations and methodological rigor underpin the findings, providing a robust framework for understanding the Bangladesh policy development process.

CONTEXT

Pregnant women and adolescent girls need nutritious diets and access to routine antenatal care services (ANC) to ensure their well-being as well as that of their babies. However, in many low- and middle-income countries (LMICs), health systems are weak, and diets are staple-based and lack diversity, leading to insufficient intake of essential micronutrients (Gernand, 2016). This results in high risks of deficiencies in iron, thiamine, riboflavin, niacin, vitamins B-6, B-12, and zinc (Bourassa, 2019).

Maternal malnutrition increases the risk of maternal morbidity and mortality and the likelihood of giving birth to low birthweight (LBW) infants, due to being born small-for-gestational age (SGA) or premature. These LBW babies face increased risks of long-term adverse health outcomes from impaired growth and development in early childhood to chronic diseases in adulthood (UNICEF, 2019).

In settings where dietary quality is poor, micronutrient deficiencies are common, and anemia and LBW are public health problems, daily multiple micronutrient supplementation (UNIMMAP-MMS) containing iron and folic acid (IFA) has been proven to prevent maternal anemia and reduce adverse pregnancy outcomes. Compared to IFA supplementation alone, MMS reduces the risk of LBW, SGA babies, stillbirths, and pre-term births (Smith et al., 2017; Keats et al., 2019).

Furthermore, replacing IFA with MMS is considered a top investment for healthy pregnancies and babies worldwide, with a return of over \$37 on each dollar spent (Larsen et al., 2023).

National governments must decide on integrating new interventions, such as MMS, into their policies and strategies, before implementation. This is often a lengthy and complicated process.

UNIMMAP MMS COMPOSITION

Vitamin A	800 µg
Vitamin D	200 IU
Vitamin E	10 mg
Vitamin C	70 mg
Thiamine	1.4 mg
Riboflavin	1.4 mg
Niacin	18 mg
Vitamin B6	1.9 mg
Folic Acid	400 µg
Vitamin B12	2.6 µg
Copper	2 mg
Iodine	150 µg
Iron	30 mg
Selenium	65 µg
Zinc	15 mg

The United Nations International Multiple Micronutrient Antenatal Preparation (UNIMMAP) MMS is an internationally accepted and standardized formulation that contains 15 essential vitamins and minerals, including iron and folic acid in recommended doses (WHO, UNICEF; UNU, 1999). In 2021, UNIMMAP MMS was included in the [WHO's model list of essential medicines](#) based on the evidence that it is effective and safe.

This case study describes Bangladesh's experience, providing valuable lessons for countries contemplating the integration of MMS or other new interventions into their health services. It summarises the essential events, processes, and the role of organizations and actors involved in creating an enabling policy environment for the introduction of MMS in Bangladesh.



OBJECTIVES

The main objectives of this study were to:

- Describe the process of formulating policies and strategies for integrating antenatal MMS in Bangladesh, including key events, processes, and roles of various organizations and actors.
- Identify and analyze the strategic actions and key factors that influenced this process, highlighting the engagement and coordinated efforts of national and international stakeholders.

The information presented is based on a thorough desk review of Bangladesh's policies, strategies, plans, and program documents, along with 15 key informant interviews with representatives from government, non-government organizations, implementing organizations, and academia undertaken by Bangladeshi researchers.

Meeting minutes, working documents, and emails shared by key informants were also reviewed. Ethical permission was obtained from the Institutional Review Board of the Institute of Health Economics, University of Dhaka* and the case study was reviewed by renowned national and international experts.

THE PROCESS

KEY ACTORS AND EVENTS

Bangladesh has emerged as a leader in introducing MMS for pregnant women. The country's commitment towards MMS has strengthened over the years, demonstrating progress in various aspects.

The journey commenced almost twenty years ago and evolved through national and international efforts. Integrating MMS into health policies and strategies demanded significant effort and strategic acumen within a complex political landscape to unite diverse nutrition actors toward a common goal. This included building sustained commitment from high-level political leaders, mid-level bureaucrats, and grass-roots implementers. Coordinated actions from a range of stakeholders contributed to this success.

A chronological mapping of key publications, events, and actors relevant to the policy process revealed the importance of engagement platforms, ongoing dialogue between policymakers and scientists, and proactive engagement by champions who seized pivotal moments for strategic advancement.

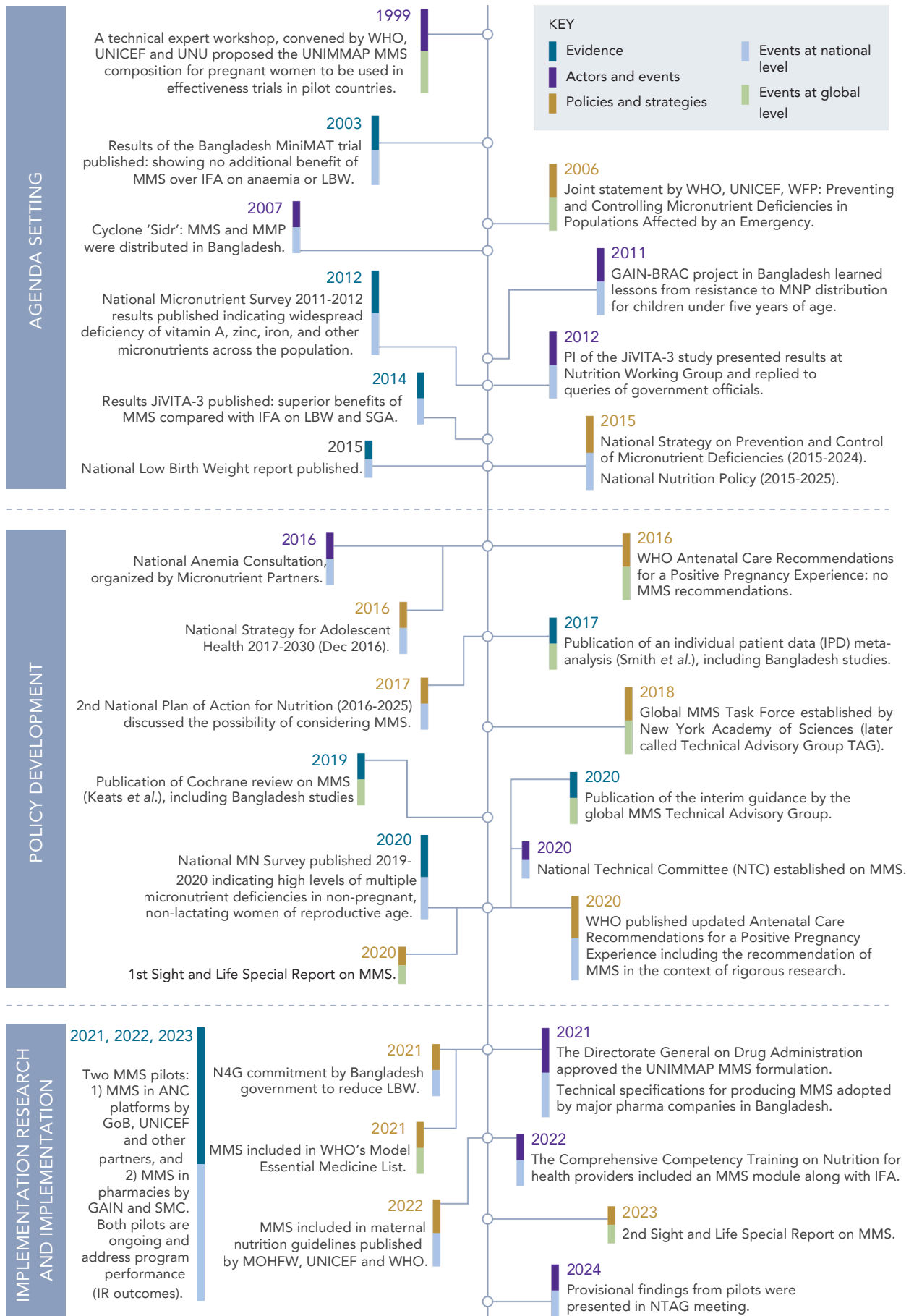
The MMS dialogue was built on strong, pre-existing relationships between credible national and international research institutes in Bangladesh (icddr,b, BRAC University, Institute of Public Health Nutrition), and existing dialogue and trust between scientists and policymakers. The timeline graphic delineates publications, events, and actors at national and international levels.

As early as 2015, several Bangladesh nutrition and health strategies and action plans started mentioning MMS, including the National Strategy on Prevention and Control of Micronutrient Deficiencies (2015-2024) in 2015 (MoHFW, 2015), the National Strategy for Adolescent Health 2017-2030 (MoHFW, 2016) and the Second National Plan of Action for Nutrition (2016-2025) (MoHFW, 2017). This early interest in MMS was sparked by evidence from MMS trials in Bangladesh and bolstered by the recommendations of a National Anemia Consultation in 2016, which advocated for MMS with a lower dose of iron (i.e., 30 mg per day instead of 60 mg in IDA) considering the country's low prevalence of iron deficiency.

* Ethical permission reference number : IHE/IRB/DU/44/2022/Final, 03 Nov 2022.



A TIMELINE OF EVENTS



ENABLING FACTORS AND CATALYTIC EVENTS

Several factors and events facilitated the successful introduction of MMS into Bangladesh's policies, strategies, and healthcare platforms.

1. A Clear Need

The 2011-2012 National Micronutrient Survey revealed significant micronutrient deficiencies in Bangladesh (IPHN, 2014), accounting for billion-dollar losses in national GDP and increased risks of LBW. This necessitated a re-evaluation of strategies, leading to the development of the National Strategy on Prevention and Control of Micronutrient Deficiencies 2015-2024. This marked the first step toward policy considerations for MMS during pregnancy (IPHN, 2015).

2. Context-specific Framing

Framing the maternal nutrition issue around anemia and LBW, proved critical for the acceptance of MMS as a solution to improving birth outcomes and engaging key actors. The 2015 LBW Survey (MOHFW, 2015) reported that a staggering 22.6% of babies in Bangladesh had LBW. The Government's commitment to reducing LBW and anemia at the 2021 Nutrition for Growth Summit in Japan further supported the introduction of MMS for pregnant women.

Trust in science at the national level is a longstanding and exceptional feature of both the government and the program community in Bangladesh.

This has laid the foundation for enabling research and reporting, encouraging discussions about the implications of research findings, and driving the government's readiness to act based on scientific results.

3. National and Global Evidence

Numerous Bangladeshi and international studies provided growing evidence on the positive effects of MMS on LBW and pre-term births, informing discussions between development partners and policymakers.

While the first study in Bangladesh (MINIMat, Maternal and Infant Nutrition Interventions, Matlab) showed the effectiveness of MMS during pregnancy in reducing infant mortality compared to IFA supplementation, there was no effect on maternal anemia or LBW (Persson et al., 2012). The findings were not published immediately and therefore not considered by policymakers.

However, the 2014 publication of the JiVitA-3 trial provided compelling evidence on the benefits of MMS (West et al., 2014), attracting the interest of government officials. These results were presented at the 2016 National Anemia Consultation, organized by the Micronutrient Partner's Group, alongside the publication of the Bangladesh LBW Report. This highlighted the potential of MMS to prevent not only anemia and other micronutrient deficiencies but also LBW, piquing the interest of government officials.

These studies from Bangladesh also contributed to the global evidence base on MMS. Similar findings were observed in trials in Southern Asia (Shankar et al., 2008). Meta-analysis of multiple MMS trials worldwide consistently showed that MMS offers additional benefits over IFA in reducing the risk of LBW, SGA birth, pre-term birth, and stillbirth (Smith et al., 2017; Keats et al., 2019). Other studies contributed to developing evidence-based arguments and solid responses to concerns about the safety and costs of MMS (Ahmed et al. 2018, Nutrition International 2019, Gernand 2019).



4. National Collaboration

Collaboration platforms facilitated consensus-building among stakeholders throughout the process of integrating MMS for pregnant women in Bangladesh, leveraging pre-existing trusting relationships. The Nutrition Working Group and the Micronutrient Partners Group organized meetings to present study results and prepare documents to raise awareness or address concerns.

National actors received support from global experts upon request. In 2018, the global MMS TAG (NYAS, 2018) developed a policy brief explaining the benefits of transitioning from IFAS to MMS in Bangladesh. In October 2019, Nutrition International published a brief on the cost-effectiveness of this transition (Nutrition International, 2019).

In 2020, the establishment of a National Technical Committee (NTC), spearheaded by the National Nutrition Services (NNS) bolstered these efforts. The NTC provides strategic and technical support to the government on MMS implementation, including advocacy and the inclusion of MMS in national standard ANC treatment guidelines and Essential Medicines List (EML). The NTC includes line directors of the Ministry of Health and Family Welfare (MoHFW), representatives from the National Nutrition Council (NNC), the Obstetrical and Gynecological Society of Bangladesh, UNICEF, other development and professional organizations, researchers, and academia.

5. International Guidance

Normative guidance, publications, and global events influenced the MMS policy integration process in Bangladesh, and vice versa.

Development of the UNIMMAP-MMS

formulation - In 1999, in a technical workshop, experts proposed the composition of a multi-micronutrient supplement for pregnant women in LMICs for use in effectiveness trials in pilot countries (WHO, UNICEF, UNU, 1999). This resulted in the formulation of UNIMMAP MMS.

shown to be safe and cost-effective. In 2007, WHO, the World Food Program (WFP), and UNICEF jointly recommended MMS to pregnant and lactating women in emergencies (WHO, UNICEF, WFP, 2007). Consequently, MMS was distributed to pregnant women during the 2007 super cyclone 'Sidr' in Bangladesh (Haque and Jahan, 2016).

Context-specific recommendations by WHO -

WHO's 2016 global ANC guidelines for a positive pregnancy experience did not recommend MMS for pregnant women generally but stated that countries with a high prevalence of nutritional deficiencies might consider providing MMS containing iron and folic acid, given the benefits of MMS on maternal health outweighing the disadvantages.

Initially, the lack of a clear recommendation by WHO hindered the introduction of MMS in Bangladesh. However, in 2020, WHO updated its guidelines and endorsed antenatal MMS with iron and folic acid in the context of rigorous research (WHO, 2020), empowering nutrition actors in Bangladesh to adopt MMS.

Support from Global Technical Advisory

Groups - In 2017, the New York Academy of Sciences (NYAS) established a global task force of international experts in micronutrient deficiencies, public health, nutrition, pediatrics, and health economics, to review the evidence on MMS, creating a global MMS Technical Advisory Group (MMS-TAG).

The TAG facilitated the coordination of actors in the MMS area and solidified the evidence base for MMS through various publications. These included guidance on the use of MMS alongside anemia treatment (MMS-TAG, 2023), iron dose analyses of the effect of MMS vs. IFA on maternal anemia and neonatal mortality (Gomes, 2022a and Gomes 2022b), analyses of the effect of MMS vs. IFA according to the gestational age assessment method (Gomes, 2023) and a cost-benefit tool (Nutrition International).



POINTS OF CONTENTION

Despite widespread interest in MMS, concerns raised by various stakeholders have occasionally hindered progress. These points underscore the need for careful consideration, implementation research, and strategic planning to address safety, efficacy, and broader impacts when introducing new nutrition interventions like MMS.

1. Safety Concerns

The initial distribution of MMS in Bangladesh alongside food rations after Cyclone Sidr in 2008 raised concerns among government officials about potential iodine overdose in women consuming iodized salt and MMS concurrently. Additionally, concerns that higher birth weight might lead to more C-sections were addressed by the Obstetrical and Gynecological Society of Bangladesh (OGSB). The OGSB is working closely with MMS stakeholders to advocate for the intervention and organize scientific seminars to address technical questions from practitioners. As members of the TAG and NTC, they also actively participate in meetings and guide the government in addressing concerns such as high birthweight and low IFA content in MMS.

2. Context-specific Iron Needs

While anemia remains a major public health concern in Bangladesh, some regions have high iron levels in groundwater, raising concerns about the 60 mg of elemental iron levels in the current antenatal IFA supplements. Following the anemia consultation in 2016, recommendations were made to lower iron doses in antenatal supplements guided by the National Micronutrient Strategy (IPHN, 2015) which aligns with the 30 mg dose of iron in the MMS UNIMMAP formulation.

3. Lessons from the Past

Lessons were drawn from the introduction of micronutrient powders (MNP) for children under 5 years of age in Bangladesh by UNICEF, GAIN, and BRAC starting in 2009. Despite successful implementation and promotion of MNPs and better child feeding practices (Afsana et al., 2014), concerns arose about nutrient-nutrient interactions, risks of overconsumption of certain micronutrients, adverse side-effects, displacing food-based approaches, lack of counseling on food-based approaches, and commercial interests of MNP suppliers.

Government officials were hesitant to include MNP for children in national policy and strategy. However, findings from a second implementation phase confirmed the feasibility and potential impact of a market-based MNP distribution model. Combined with child nutrition counseling by community health workers, this model significantly reduced anemia and improved MNP coverage (Sharma et al., 2023).

These concerns led to a cautious approach to MMS despite positive results from JivItA-3 trials in 2014, as global evidence and guidance on MMS for pregnant women were still limited at the time.



Photo Credit © World Bank | Rama George-Alleyne



IMPLEMENTATION RESEARCH

Following WHO's recommendation to implement MMS in the context of rigorous research, the Government of Bangladesh (GoB) initiated two types of demonstration pilots for MMS:

1. A pro-poor model with free distribution of MMS through ANC services, supported by UNICEF, in two target districts.
2. A market-based model with MMS sales through private sector pharmacies supported by the Global Alliance for Improved Nutrition (GAIN), in the remaining 62 districts of Bangladesh.

The purpose of implementation research (IR) is to use scientific methods to understand, quantify, qualify, and improve the performance characteristics of programs.

These studies are not focused on demonstrating the impact on pregnancy outcomes, but rather on specific IR outcomes indicators such as adherence, coverage, feasibility, programmatic efficiencies, and cost differentials.

Both pilots started in 2021, and are ongoing, with initial findings presented to policymakers, non-government agencies, and other nutrition stakeholders in April 2024.

Additionally, efforts are underway to increase the production capacity of high-quality UNIMMAP MMS by Bangladesh pharmaceutical companies. This is crucial not only for the commercial supply through pharmacies but also to meet the growing demand from the public sector health system. Enacting the national MMS policy will require an MMS supply capable of meeting the public sector demand (Ajello et al., 2023).



Photo Credit © pixabay | billycm |



A TWO-PRONGED APPROACH TO MMS DISTRIBUTION IN BANGLADESH

The Government of Bangladesh is supporting pilots for two demonstration models for MMS to identify their feasibility in the Bangladesh context, before exploring further expansion:

1. A pro-poor, public sector model with free distribution of MMS through ANC services

To strengthen maternal nutrition services in the public health ANC platform, a demonstration pilot on the use of prenatal MMS is being implemented in two districts of Bangladesh: Bhola and Kurigram. This pilot is led by the Government of Bangladesh and UNICEF, with support from the Bill and Melinda Gates Foundation, the International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b), Sight & Life, and Pennsylvania State University.

MMS coverage and acceptance were assessed by comparing supplement consumption, pregnancy weight gain monitoring, and dietary counseling in the intervention (MMS) and control (IFA) areas. In the intervention areas, 90% of pregnant women received MMS compared to 52% receiving IFA in the control areas. Higher distribution and consumption levels were measured for MMS (111.8±63 tablets received, 83.2±67.9 consumed) than IFA (70.4±70.4 received, 62.9±68.1 consumed). More pregnant women in intervention areas consumed the recommended 180 tablets (30%) than IFA in control areas (12%).

An implementation pilot in ready-made garment (RMG) factories, comparing IFA distribution to MMS distribution, weight gain monitoring, and nutrition counseling led to an increase in ANC visits by pregnant female workers: 37% of pregnant women received 4 or more ANC visits (up from 23%), with 67% demonstrating high adherence to MMS, 25% medium, and only 8% low.

2. A market-based, private-sector model with MMS sales through private-sector pharmacies

GAIN coordinates the market-based MMS model in partnership with the Social Marketing Company (SMC), and the Sight and Life Foundation (SAL), with support from the Children's Investment Fund Foundation (CIFF). The National Nutrition Service (NNS) provides strategic and technical direction through the National Technical Committee (NTC). Consumer insights research revealed that MMS is acceptable and desirable when promoted effectively and when consumers are willing to pay. A Knowledge, Attitude, and Practices survey helped set the price and determine the packaging and brand name.

Following the Directorate General of Drug Administration's approval of the UNIMMAP formulation in March 2021 with the brand name FullCare, Renata Ltd started the production of FullCare MMS and delivered the first batches by June 2021. From July 2021 to March 2024, SMC distributed FullCare MMS across 62 districts of Bangladesh through more than 40,000 pharmacy outlets, selling over 50 million tablets, and reaching approximately 600,000 pregnant women. FullCare MMS is sold in blister packs, at BDT 4 per tablet, or BDT 780 for the full course of 180 tablets (US\$6.80).

Since FullCare is categorized as a drug, advertising to consumers is not permitted. Therefore, demand generation focuses on capacity building for pharmacists and healthcare providers. From 2022 onwards, 5,118 gatherings facilitated primary pregnancy care and nutrition counseling, benefiting 25,518 women nationwide. www.smc-bd.org/testnewup/mms.



CONCLUSIONS AND RECOMMENDATIONS

Integrating MMS into Bangladesh's public health policies and strategies demonstrated the effective interplay between scientific, policy, and implementation perspectives. This case study describes the strategic steps required to overcome barriers for successful integration. For instance, creating technical guidelines for piloting is beneficial before integrating MMS into national maternal and/or adolescent health and nutrition policies and strategies. Technical guidelines provide details necessary for implementation, while policies or strategies offer broader solutions.

Close collaboration and dialogue, and learning from past experiences, have enabled nutrition partners in Bangladesh to identify opportunities for integrating MMS into nutrition policies and strategies while addressing concerns and challenges. This approach has facilitated the simultaneous implementation of a public and private sector demonstration pilot (see Box).

The experiences in Bangladesh demonstrate the importance of strategic collaboration between researchers, who provide the scientific evidence base on the efficacy and effectiveness of nutrition interventions, and decision makers, who develop nutrition strategies and policies. Furthermore, rigorously designed implementation research provides the evidence base for programmatic decisions on the introduction, implementation, and scaling of new interventions.

Recommendations for future nutrition policy development include:

1. Translate scientific evidence into context-specific policy-relevant recommendations.

Researchers should engage with policymakers to address their concerns and foster a shared understanding. Bridge the gap between scientific findings and policy by clearly communicating evidence-based recommendations tailored to specific contexts.

2. Establish and support Technical Advisory Committees or Multisectoral Nutrition Working Groups.

These platforms, chaired by a relevant ministry or directorate, facilitate transparent dialogue among government, researchers, and development partners, supporting consensus-building for national policy and strategy development. Ensure adequate resources for organizing meetings and preparing reports.

3. Empower strategic champions and maintain institutional memory.

Identify and empower advocates who can strategically drive policy advancement. Equip them with evidence-based resources, including policy briefs and presentations in accessible language. Engage broadly across ministries and departments to maintain institutional memory and mitigate turnover challenges.

4. Make strategic use of key global and national moments or events.

Examine policy and strategy planning cycles as well as national or global event calendars. Plan meetings and presentations strategically ahead of key moments.



Photo © Getty Images Signature | damircudic



REFERENCES

1. Afsana K, Haque MR, Sobhan S, Shahin SA. BRAC's experience in scaling-up MNP in Bangladesh. *Asia Pac J Clin Nutr*. 2014; 23(3):377-84. doi:<https://doi.org/10.6133/apjcn.2014.23.3.22>
2. Ahmed F, Khan MR, Shaheen N, et al. Anemia and iron deficiency in rural Bangladeshi pregnant women living in areas of high and low iron in groundwater. *Nutrition*. (2018); 51, 46-52. doi: 10.1016/j.nut.2018.01.014
3. Ajello CA, Suwantika A, Santika O, et al. UNIMMAP MMS for National Health Systems: Considerations for Developing a Supply Strategy. https://kirkhumanitarian.org/wp-content/uploads/2022/11/UNIMMAP-MMS-Supply-Paper_Digital-Version-1-FINAL-1-1.pdf. Published November, 2022. Accessed July 12, 2024.
4. 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:<https://doi.org/10.1111/nyas.14121>
5. Gernand AD. The upper level: examining the risk of excess micronutrient intake in pregnancy from antenatal supplements. *Ann N Y Acad Sci*. 2019; 1444(1):22-34. doi:<https://doi.org/10.1111/nyas.14103>
6. Gernand AD, Schulze KJ, Stewart CP, West KP, Christian P. Micronutrient deficiencies in pregnancy worldwide: health effects and prevention. *Nature reviews Endocrinology*. 2016; 12(5):274-289. doi:<https://doi.org/10.1038/nrendo.2016.37>
7. Gomes F, Agustina R, Black RE, et al. Multiple micronutrient supplements versus iron-folic acid supplements and maternal anemia outcomes: an iron dose analysis. *Ann N Y Acad Sci*. 2022; 1512(1):114-125. doi:<https://doi.org/10.1111/nyas.14756>
8. Gomes F, Agustina R, Black RE, et al. Effect of multiple micronutrient supplements vs iron and folic acid supplements on neonatal mortality: a reanalysis by iron dose. *Public Health Nutr*. 2022; 25(8):2317-2321. doi:<https://doi.org/10.1017/s1368980022001008>
9. Gomes F, Askari S, Black RE, et al. Antenatal multiple micronutrient supplements versus iron-folic acid supplements and birth outcomes: Analysis by gestational age assessment method. *Matern Child Nutr*. 2023; 19(3). doi:<https://doi.org/10.1111/mcn.13509>
10. Haque A, Jahan S. Regional Impact of Cyclone Sidr in Bangladesh: A Multi-Sector Analysis. *International Journal of Disaster Risk Science*. 2016; 7(3):312-327. doi:<https://doi.org/10.1007/s13753-016-0100-y>
11. Institute of Public Health Nutrition. National Low Birth Weight Survey (NLBWS) 2015 in Bangladesh. Dhaka, Bangladesh; 2015.
12. Institute of Public Health Nutrition. National Micronutrient Survey 2011-12, Final Report. <https://www.unicef.org/bangladesh/media/4631/file/National>. Published 2014. Accessed February 14, 2024.
13. Institute of Public Health Nutrition. National strategy on prevention and control of micronutrient deficiencies, Bangladesh (2015-2024). <http://iphn.dghs.gov.bd/wp-content/uploads/2016/01/NMDCS-.pdf>. Published 2015. Accessed February 14, 2024.
14. Keats EC, Haider BA, Tam E, Bhutta ZA. Multiple-micronutrient supplementation for women during pregnancy. *Cochrane Database Syst Rev*. 2019; 2019(3): CD004905. doi:<https://doi.org/10.1002/14651858.cd004905.pub6>
15. Larsen B, Hoddinott J, Razvi S. Investing in Nutrition: A Global Best Investment Case. *Journal of benefit-cost analysis*. *Journal of Benefit-Cost Analysis*. 2023;14(S1):235-254. doi:<https://doi.org/10.1017/bca.2023.22>
16. Lauren A, Satria A, Steets A, et al. Sight and Life Special Report: Focusing on Multiple Micronutrient Supplementation (MMS) in Pregnancy. <https://doi.org/10.52439/IZGR8541>. Published January, 2020.
17. Multiple Micronutrient Supplementation Technical Advisory Group (MMS TAG). *Interim Guidance for Concurrent Antenatal Multiple Micronutrient Supplementation and Anemia Treatment in Pregnant Women*. Published 2023. Accessed February 14, 2024.
18. The New York Academy of Sciences. The Benefits of Multiple Micronutrient Supplements in Pregnancy Technical Brief for Policy Makers: Bangladesh. <https://www.nyas.org/wp-content/uploads/2024/02/trm-i-technical-brief-for-policy-makers-draft-1.pdf>. Published 2018. Accessed February 14, 2024.
19. Ntambue A, Flaxman AD, Sanga A, et al. Sight and Life Special Report: Focusing on Multiple Micronutrient Supplementation (MMS) in Pregnancy: Second Edition. <https://doi.org/10.52439/uzng4230>. Published May, 2023.
20. Nutrition International. A tool to aid decision-making transition from IFAS to MMS. <https://www.nutritionintl.org/learning-resources-home/mms-cost-benefit-tool/>. Accessed February 14, 2024.
21. Nutrition International. Cost-effectiveness of transitioning from iron and folic acid to multiple micronutrient supplementation for pregnancy. <https://www.nutritionintl.org/wp-content/uploads/2019/10/MMS-policy-brief-bangladesh-2019-10-18-web.pdf>. Published October 2019.
22. Persson LÅ, Arifeen S, Ekström EC, et al. Effects of Prenatal Micronutrient and Early Food Supplementation on Maternal Hemoglobin, Birth Weight, and Infant Mortality Among Children in Bangladesh: the MINIMat randomized trial. *JAMA*. 2012; 307(19). doi:<https://doi.org/10.1001/jama.2012.4061>
23. Sarma H, Rahman M, Tariqujjaman M, et al. Impact of market-based home fortification with micronutrient powder on childhood anemia in Bangladesh: a modified stepped wedge design. *Front. Nutr*. 2024;10. doi:<https://doi.org/10.3389/fnut.2023.1271931>
24. Shankar AH, Jahari AB, Sebayang SK, et al. Effect of maternal multiple micronutrient supplementation on fetal loss and infant death in Indonesia: a double-blind cluster-randomised trial. *Lancet*. 2008; 371(9608):215-227. doi:[https://doi.org/10.1016/s0140-6736\(08\)60133-6](https://doi.org/10.1016/s0140-6736(08)60133-6)
25. Smith ER, Shankar AH, Wu LSF, 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:[https://doi.org/10.1016/s2214-109x\(17\)30371-6](https://doi.org/10.1016/s2214-109x(17)30371-6)
26. UNICEF-WHO. Low Birthweight Estimates: Levels and trends 2000-2015. <https://www.unicef.org/media/53711/file/UNICEF-WHO%20Low%20birthweight%20estimates%202019%20.pdf>. Published May, 2019.
27. West KP Jr, Shamim AA, Mehra S, et al. Effect of Maternal Multiple Micronutrient vs Iron-Folic Acid Supplementation on Infant Mortality and Adverse Birth Outcomes in Rural Bangladesh. *JAMA*. 2014; 312(24):2649-2649. doi:<https://doi.org/10.1001/jama.2014.16819>
28. World Health Organization. WHO Antenatal Care Recommendations for a Positive Pregnancy Experience. Nutritional Interventions Update: Multiple Micronutrient Supplements during Pregnancy. Geneva: World Health Organization; 2020.
29. World Health Organization; UNICEF; World Food Programme. Preventing and Controlling Micronutrient Deficiencies in Populations Affected by an Emergency. <https://www.who.int/publications/m/item/WHO-WFP-UNICEF-statement-micronutrients-deficiencies-emergency>. Published April 7, 2006. Accessed February 14, 2024.
30. World Health Organization; UNICEF; United Nations University. Composition of a Multi-Micronutrient Supplement to Be Used in Pilot Programmes among Pregnant Women in Developing Countries. <https://apps.who.int/iris/handle/10665/75358>. Published 1999. Accessed February 14, 2024.



ACKNOWLEDGEMENTS

This case study was developed by Mahbubur Rashid, Abu Ahmed Shamim, Md Ruhul Amin, and Sneha Sarwar (consultants), Tareq Hasan and Nilima Azad (GAIN), Isabelle Michaud-Letourneau and Marion Gayard (consultants), Martin Mwangi and Marti van Liere (Micronutrient Forum).

The authors greatly appreciate the contributions of all informants, whose responses were compiled and synthesized to inform this case study. Representatives from the following organizations in Bangladesh were interviewed: the Ministry of Health and Family Welfare, the Institute of Nutrition and Food Sciences, the Bangladesh Breastfeeding Foundation, the Obstetrical and Gynecological Society of Bangladesh, the Social Marketing Company, Renata Limited, FHI360, the Global Alliance for Improved Nutrition, Nutrition International, the United Nations Children’s Fund, and the World Health Organization.

The authors would like to acknowledge the thorough review of this case study by key experts with long-standing experience in Bangladesh: Prof. Keith West, Bloomberg School of Public Health, Johns Hopkins University, Ms. Rudaba Khondker, Bangladesh Country Director GAIN, and Dr. Saskia Osendarp, Executive Director of the Micronutrient Forum.

The authors also extend their gratitude to Rijuta Pandav for designing the document and Terry Nightingale for designing the timeline graphic depicting the key actions and events in Bangladesh’s success story.



Source: Women’s Voices Film - Jahanara, Bangladesh

About HMHB

The **Healthy Mothers Healthy Babies Consortium (HMHB)**, hosted by the **Micronutrient Forum**, is a growing collective of more than 300 organizations and individuals dedicated to improving maternal nutrition. We work collaboratively to accelerate the availability and effective use of affordable multiple micronutrient supplementation (MMS) and other nutrition interventions, such as balanced energy and protein (BEP) dietary supplementation during pregnancy, in low and middle-income countries.

HMHB also hosts global Technical Advisory Groups (TAG) on MMS (**MMS TAG**) and BEP (**BEP TAG**). These TAGs, comprising experts in nutrition, maternal health, and public health, interpret evidence, address knowledge gaps, and provide high-fidelity practical guidance to governments, NGOs, foundations, multilateral organizations, and the private sector.

Visit our [website](#) for the latest knowledge, evidence, guidance, and tools on maternal nutrition. Explore the [World Map on MMS](#), [Knowledge Hub](#), [Advocacy Resource Center](#), [Women’s Voices](#) short films, and [Knowledge Byte](#) videos. Join us in powering women’s nutrition for promising futures. [Become a member.](#)



hmhbconsortium.org



HMHB@micronutrientforum.org



Micronutrient Forum



MNForum

