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# Integrating Multiple Micronutrient Supplementation into Primary Health Care:

## Evidence to inform policy and practice

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## BACKGROUND AND RATIONALE

Maternal micronutrient deficiencies, including anaemia, which affects an estimated 61% of pregnant women nationally and exceeds 70% in some northern states such as Bauchi, remain a major public health challenge in Nigeria.[1] Maternal anaemia increases the risk of maternal mortality and is associated with adverse birth outcomes such as low birth weight and preterm birth, which in turn contribute to poor child growth and survival.

Accumulating global evidence has shown that multiple micronutrient supplementation (MMS), which provides 15 essential vitamins and minerals in a single daily tablet, is effective and cost-effective in improving birth outcomes and offering protection against maternal anaemia. In recognition of this evidence, the World Health Organization (WHO) has recommended that implementation research be conducted in low- and middle-income countries (LMICs) to inform decisions on the introduction of MMS within routine antenatal care (ANC).[2]

In 2021, Nigeria's Federal Ministry of Health approved the use of MMS during pregnancy through its updated National Guidelines for the Prevention and Control of Micronutrient Deficiencies.[3] National stakeholders subsequently identified a critical need for context-specific implementation evidence to understand how MMS can be effectively delivered, accepted, and adhered to within the Nigerian health system, particularly in light of the implementation bottlenecks and adherence gaps previously documented in antenatal iron and folic acid (IFA) supplementation programs.[3] This is particularly important given that achieving high adherence during pregnancy is essential for realizing the health benefits of MMS.[4]

## THE NIGERIA MMS IMPLEMENTATION RESEARCH PROJECT

The Nigeria MMS Implementation Research project was conducted to inform the effective introduction and scale-up of MMS within the public ANC platform and help optimize daily adherence to MMS among pregnant women. By integrating MMS into existing health system platforms and focusing on the experiences of women and frontline healthcare workers (HCWs), the research sought to produce actionable lessons for Nigeria and other resource-limited settings considering the adoption of MMS as the new standard of care for the prevention of anaemia during pregnancy.

### Project design

The project was conducted in Bauchi State and adopted a comparative approach using two MMS delivery packages: the standard introduction package, hereafter referred to as MMS-Core, and the adherence package, hereafter referred to as MMS-Core+. Human-centered design informed the development of the adherence solutions, and mixed-methods implementation research was used to evaluate them.[5]

| | MMS-Core | MMS-Core+ |
|---|---|---|
| **Description** | Represents a foundational introduction package that supports MMS rollout and strengthens the underlying health-system building blocks[6] required for routine implementation | Building on MMS-Core; designed to address barriers beyond the health facility, including behavioral, social, and system-level factors, by incorporating multi-level, human-centered adherence solutions |
| **Components** | Facility level system strengthening, including:<br>• Reliable commodity availability<br>• Capacity-building of ANC providers<br>• Provision of related tools and job aids<br>• Monitoring and supportive supervision | In addition to all components of MMS-Core, MMS-Core+ included:<br>• Capacity strengthening of ANC providers and community members (HCWs, mama-to-mama (M2M) and Ward Development Committees (WDC) members)<br>• Strengthened counselling supported by structured tools and job aids<br>• MMS card to support routine-building and tracking intake<br>• Strengthened M2M home visits using structured counselling tools and referral coordination with health facilities<br>• WDC-led community awareness and sensitization |

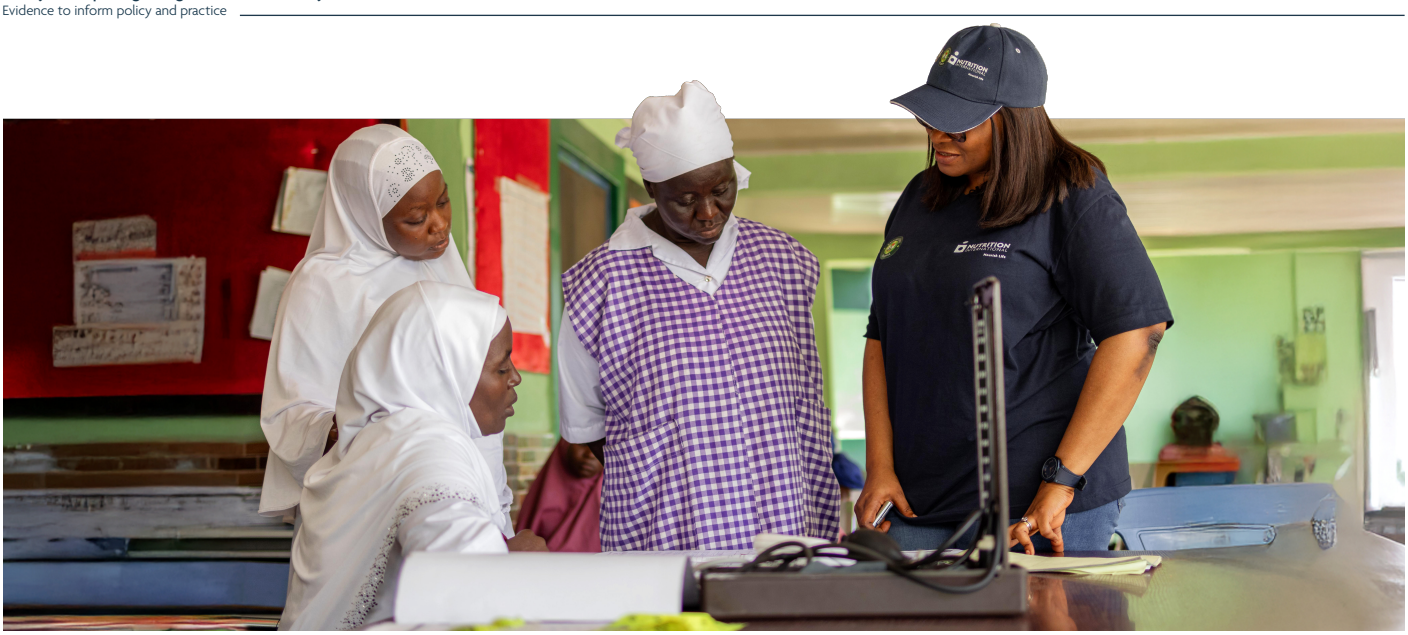
### Evaluation overview

The evaluation combined quantitative and qualitative methods to assess outcomes and implementation processes.

- Outcome evaluation: Population-based cross-sectional surveys conducted at baseline (March 2024) and endline (April 2025) among pregnant women*, husbands, and HCWs.
- Process evaluation: Qualitative research involving pregnant women, HCWs, husbands, and community (M2M and WDC members).

Together, these methods assessed MMS acceptability among key stakeholders; acceptability and perceived feasibility of adherence solutions; women's adherence to MMS; and key enablers and barriers.

*Pregnant women and women up to three months postpartum who had received MMS for at least 30 days.



# KEY FINDINGS

## Acceptability of MMS

Irrespective of the package used, MMS was widely accepted across all stakeholder groups, including pregnant women, husbands, and HCWs.

- The majority of pregnant women (>96%) and husbands (>93%) reported that it is 'important' or 'very important' for pregnant women to take MMS every day.
- Almost all HCWs (>98%) described the introduction of MMS into the health system as 'positive' or 'very positive'.
- Acceptability of MMS remained consistently high at both baseline and endline, without reduction over time.

## Factors influencing MMS acceptability

Perceived benefits of MMS were cited as enablers of its acceptability among stakeholders, including:

- Increased strength and energy during pregnancy
- Improved appetite
- Perceived benefits for fetal growth and movement
- Reduced symptoms such as fatigue and weakness

Some women linked MMS with side effects (e.g., nausea, dizziness, or stomach discomfort), although these were often described as temporary or may have been attributed to pregnancy itself. A small number of women expressed neutral views, indicating neither strong perceived benefit nor harm.

**Policy implication:**

High acceptability across users and providers suggests strong stakeholder support for continued integration of MMS within routine ANC service, while highlighting the importance of reinforcing counseling to address perceived side effects.

## Acceptability and perceived feasibility of adherence solutions

Components of the adherence solutions implemented within MMS-Core+ were generally well received by stakeholders.

- Almost all pregnant women (>92%) indicated finding it 'acceptable' or 'very acceptable' for a community member (i.e. M2M member) to visit a pregnant woman at her home to discuss MMS.
- More than 94% of pregnant women reported that it was 'acceptable' or 'very acceptable' for their husbands to support them in taking MMS.
- The majority of husbands (>96%) reported that it 'acceptable' or 'very acceptable' for them to support their wives in taking MMS.
- The proportion of pregnant women who reported receiving counselling from HCWs on ways to support daily MMS intake increased over time.
- Approximately 95% of HCWs 'agreed' or 'strongly agreed' that they could effectively engage husbands or family members regarding MMS adherence.

**Policy implication:**

Adherence solutions building on family and community engagement were acceptable among both pregnant women and implementers (HCWs). Providers generally reported confidence in delivering these approaches, reflecting perceived feasibility within routine services.

## Adherence to MMS

Overall adherence to MMS was high and sustained over time.
Nearly all women (≥97%) who received MMS initiated consumption.

Average adherence among pregnant women (i.e. number of tablets consumed divided by number of tablets that should have been consumed) significantly increased from approximately 78% at baseline to 81% at endline, and improvements were observed with both MMS-Core and MMS-Core+.

Sustained MMS use (≥90 tablets)*:

- There was a statistically significant increase in the proportion of women reporting consumption of at least 90 MMS tablets between baseline and endline: Increases were observed with both MMS-Core (26% to 48%) and MMS-Core+ (30% to 42%).
- This level of consumption appears higher than what is typically observed for IFA consumption in Nigeria, where, nationally only around 30% of women, and in Bauchi State about 23% consumed ≥90 IFA tablets in their previous pregnancy.[1]

## Adherence patterns and interruptions

Despite high overall adherence, intermittent discontinuation was common:

- Approximately 2 in 5 women stopped taking MMS at some point during their pregnancy.
- The most common reasons for stopping were perceived or experienced side effects and forgetting.

Importantly, most women resumed MMS use, often due to:

- Reminders from husbands or other family members
- Advice and reassurance from HCWs
- Addressing perceived side effects with proper counseling

## Enablers and barriers to MMS adherence:

Enablers of adherence included:

- Support from family members, especially husbands
- Access to free or low-cost services
- Consistent availability of commodities
- Perceived benefits of MMS
- M2M engagement
- Use of counseling-derived adherence strategies such as linking supplement intake to daily routines, placing the MMS bottle in visible locations, and use of MMS Card

Barriers to adherence included:

- Distance to facilities
- Women's limited autonomy in health decision-making
- Rumors and misconceptions around the safety and health effects of MMS

**Policy implication:**

Both MMS-Core and MMS-Core+ achieved high adherence, suggesting that integrating MMS into strengthened routine ANC can effectively support supplement use. Reliable MMS supply and uninterrupted access are essential for sustaining adherence, highlighting supply as a program priority. MMS-Core helped establish the foundation for strong initial uptake and adherence within routine ANC services. Building on this foundation, the adherence solutions implemented as part of MMS-Core+ contributed additional gains in facilitating adherence behaviors via family engagement, community support (M2M), and structured counseling tools.


* Based on a sub-sample of women who had sufficient time to consume ≥90 tablets; estimates are not directly comparable with DHS data

## SUMMARY OF KEY FINDINGS FOR POLICYMAKERS

MMS introduction through routine ANC is acceptable, feasible, and well-received by women, families, health providers, and communities.

High MMS adherence is achievable in real-world ANC settings when supported by strong health system implementation, including reliable supply, quality counselling, capacity building, monitoring, and supportive supervision.

Even with overall strong adherence, temporary discontinuation is common, underscoring the importance of follow-up counseling and social support.

The implementation of adherence solutions within MMS-Core+ suggests added value beyond the MMS-Core package, provided adequate training of personnel, availability of appropriate tools, and sufficient system investment.

# POLICY RECOMMENDATIONS

Based on the implementation research findings, the following policy and programmatic recommendations are proposed to support sustainable scale-up of MMS in Nigeria and similar contexts.

## State-Level Recommendations:

1. **Institutionalize MMS as a routine standard of ANC**
   - Ensure MMS distribution and counselling are embedded into comprehensive ANC services, starting from early ANC and continuing through follow-up visits.
   - Use MMS-related SOPs and job aids to standardize delivery across facilities.
   - Maintain uninterrupted stock at point of care.

2. **Strengthen counseling quality through health worker training and supportive supervision**
   - Train ANC providers on MMS benefits, side-effect management, missed doses, and counselling techniques, supported by consistent messaging to maintain trust and prevent misinformation.
   - Use health facility supportive supervision visits to reinforce ANC and MMS counselling quality and problem-solving.

3. **Integrate context-appropriate family and community support within ANC delivery**
   - Where feasible, engage community platforms (e.g. M2M) to reinforce messages and support follow-up.
   - Promote husbands and family engagement to support MMS adherence among pregnant women.
   - Strengthen facility and community linkages where possible.

4. **Plan for adherence interruptions and re-engagement**
   - Encourage providers to routinely ask about missed doses and promote restarting MMS.
   - Support providers to counsel on appropriate management of side effects.
   - Train and integrate the use of simple reminder or tracking tools where feasible.

5. **Monitor implementation quality, not only coverage**
   - Track indicators related to counselling quality and stock continuity.
   - Use data for adaptive management and continuous improvement.

## Federal-Level Recommendations:

1. **Integrate MMS within national ANC policies and standards**
   - Incorporate MMS into national ANC protocols and service delivery.
   - Foster alignment across maternal health and nutrition programs and policies.

2. **Establish harmonized national guidance for counselling and adherence support**
   - Standardize counselling guidance that addresses benefits, side effects, missed doses, and the importance of sustained use.
   - Clarify appropriate MMS use for anaemic and non-anaemic pregnant women.
   - Integrate adherence messaging within broader ANC quality-improvement initiatives.

3. **Secure sustainable supply and financing mechanisms**
   - Include MMS in national forecasting, procurement, and supply planning, aligned with the costed national roadmap.
   - Leverage sustainable financing mechanisms and align partner support.
   - Assess the feasibility of quality-assured local production of MMS.

4. **Adopt a phased national scale-up strategy**
   - Begin with nationwide implementation of an introduction package (MMS-Core), supported by health system strengthening efforts, with flexibility for states to adopt enhanced adherence solutions based on context.

5. **Establish national monitoring and accountability for MMS implementation.**
   - Define national indicators on counselling quality, coverage, and stock continuity.
   - Integrate MMS indicators into national reporting systems.
   - Use national data reviews to support state performance improvement.

## WAY FORWARD

Nigeria has generated context-specific evidence showing that MMS can be delivered through routine ANC services, achieve high adherence, and remain manageable for frontline health providers, even in resource-constrained settings. The opportunity now is to act on this evidence through:

- Continued institutionalization of MMS within ANC policies, budgets, and routine service delivery platforms at federal and state levels.
- Consideration of both commodity and additional transition costs in national and state plans and costed roadmaps to support sustainable scale-up and promote early ANC engagement.
- Promotion of high-quality counselling, family engagement, and continuity of care as essential components of effective MMS delivery within comprehensive ANC.
- Focusing MMS delivery on sustained integration within routine ANC, rather than campaign-style platforms, to support ongoing counselling, follow-up, and quality of care.
- Alignment of donor and development partner financing and technical assistance to support phased scale-up, health worker capacity building, and learning systems that prioritize adherence as well as coverage. "
- Building on lessons from Nigeria's implementation experience to inform MMS introduction in other LMICs.

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