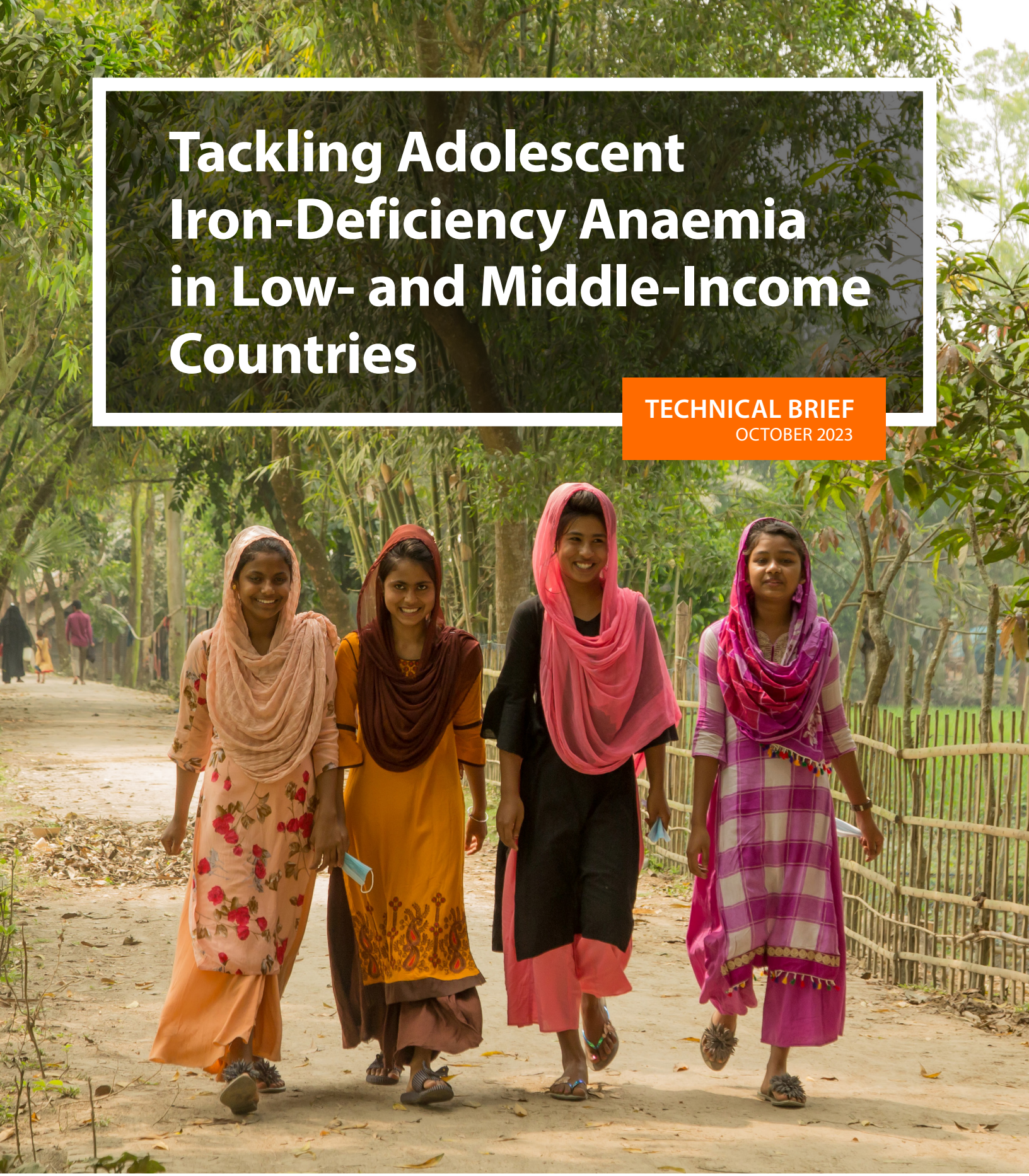
Tackling Adolescent Iron-Deficiency Anaemia in Low- and Middle-Income Countries

TECHNICAL BRIEF
OCTOBER 2023



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ACRONYMS

IFAS	Iron-Folic Acid Supplementation
LMIC	Low- and Middle-Income Countries
MMS	Multiple Micronutrient Supplementation
SDG	Sustainable Development Goal
WHO	World Health Organization

1. PROBLEM STATEMENT

Over one billion adolescent girls and women worldwide have anaemia, significantly overlapping with other micronutrient deficiencies in the same group (1). The inadequate prioritisation for adolescent girl nutrition within implementation of policies and programming is an urgent gap that must be addressed to achieve key Sustainable Development Goals (SDGs) to eliminate malnutrition for all and the World Health Assembly target of 50 per cent reduction of anaemia among women and girls of reproductive age by 2030 (SDG 2.2) and attain gender equality for all (SDG 5). Although there are multiple causes of anaemia, including malaria and soil-transmitted helminths, 60 per cent of the total global burden of anaemia is due to iron deficiency (2). Thus, iron deficiency anaemia is one of the leading causes of disability-adjusted life years lost globally among girls and boys aged 10 to 14 years and adolescent girls aged 15 to 19 years (3). Iron deficiency remains the most common micronutrient deficiency, resulting in missed opportunities for healthy physical growth, mental health, cognitive development, and overall well-being. When adolescent girls and young women have access to a healthy diet and nutrition services that are tailored to their specific gender-related needs, they are more likely to attend school regularly and perform better academically. In addition, the ability to manage their own nutrition status through self-efficacy can empower them to reach their full potential in various aspects of life.

2. CORE RECOMMENDATIONS TO DECREASE ADOLESCENT GIRL ANAEMIA

2.1. Reducing adolescent anaemia through micronutrient supplementation

In populations where the prevalence of anaemia is 20 per cent or higher, intermittent iron-folic acid supplementation (IFAS) is recommended for all adolescent girls and non-pregnant adult women who are menstruating (4). In contexts where the prevalence of anaemia is 40 per cent or higher, daily IFAS is recommended for the same population (4). School-based intermittent interventions with IFAS are effective in reducing anaemia (5). However, numerous nutrient deficiencies coexist in low- and middle-income countries (LMICs), and multiple micronutrient supplementation (MMS) may confer additional benefits in reduction of anaemia and other micronutrient deficiencies and improve school performance outcomes. A recent individual participant data meta-analysis of 15,283 adolescents within 13 trials in LMICs showed that adolescent girls who received MMS had a significantly reduced risk of low birth weight, preterm births, and small-for-gestational-age births compared to those who received IFAS (6, 7). Emerging evidence from a cluster randomised trial in Burkina Faso found that integrated strategies may be more effective at reducing anaemia than supplementation alone (8).

2.2 Preventing adolescent girl anaemia through consumption of iron-rich foods and equitable intra-household food allocation

The frequent consumption of iron-rich foods, especially animal-based iron-rich foods, is associated with a significantly lower risk for anaemia among adolescent girls (9). However, a heavy reliance on grain and cereal-based diets in many contexts, including among adolescents, also hinders iron absorption (10). Moreover, adolescents often trade foods high in iron and other micronutrients for sugary drinks and ultra-processed foods. A recent UNICEF report found that 42 per cent of adolescents in LMICs consume carbonated soft drinks at least once a day (11). In sub-Saharan Africa, income growth combined with urbanisation is driving the demand for more ultra-processed foods that lack nutritional value (12). Inequitable intra-household food allocation (both quantity and quality) often favours men and boys (13). The nutritional rights and dietary requirements of children and adolescents have often been overlooked within the global food system agenda, making it crucial to address the redesign of the food environment (14). Proximity to fast-food outlets and convenience stores, coupled with a high concentration of such establishments in residential neighborhoods, can significantly increase the likelihood of adolescents buying food from these sources (14).

2.3. Ending child marriage and delaying age of first pregnancy

Adolescence is a critical period of growth, and high fertility rates among adolescent girls compound the challenges for adequate iron stores and prevention of anaemia. An estimated 21 million adolescent girls aged 15 to 19 years in developing regions become pregnant, and approximately 12 million of them give birth every year (15). The global adolescent birth rate has decreased from 64.5 births per 1000 women (15–19 years) in 2000 to 41.3 births per 1000 adolescent girls in 2023 (16). The unequal gender and social norms underly the high fertility rates among this age group, creating urgency to support the sexual and reproductive health rights of adolescent girls and boys with access to comprehensive sexual education, contraceptives, and supportive health services. Further, decreasing adolescent girl anaemia contributes toward improving the nutritional status of newborns. Malnutrition contributes to 45 per cent of deaths in children under five years (17). When undernourished girls give birth early, the intergenerational cycle of anaemia continues. Maternal undernutrition is a known determinant of poor neonatal health outcomes, with undernourished mothers more likely to give birth to low-birthweight babies (18). New evidence published in the Lancet shows that stunting and wasting may already be present at birth, and both peak in the first six months of life (19). Improving the nutritional status of adolescent girls and young women can significantly improve newborns' nutritional status and break the intergenerational cycle of anaemia.

2.4. Preventing adolescent anaemia through formative research and human-centred design interventions

Strategies to address micronutrient deficiencies among women and adolescents have neglected a user-centred design approach in developing guidelines, policies, and strategies to prevent iron-deficiency anaemia. There is a need to change the conversation around anaemia from a biomedical issue to a social justice and health equity issue, especially among vulnerable adolescents in low-resource settings. Thus, agency and the capacity for adolescent girls to have the power to negotiate and exert control over their lives regarding their educational, health, and nutrition practices are important areas to explore. Formative research methodologies and human-centred design approaches can help identify the experiences, needs, priorities, and preferences of adolescent girls and increase the potential for adopting desired behaviours and practices to reduce adolescent anaemia.

3. STRATEGIC OPPORTUNITIES

3.1 Evidence-building for the efficacy of MMS versus IFAS among non-pregnant adolescent girls

Building evidence for the efficacy of MMS versus IFAS among non-pregnant adolescent girls is a first step to supporting its use in national policies. The evidence for use of daily IFAS in contexts where anaemia prevalence is very high (>40%) among menstruating adult women and adolescent girls and intermittent IFAS in contexts where prevalence of anaemia is high (20–39%) among the same target groups have supported these interventions as a strong recommendation from the World Health Organization (20, 21). Intermittent iron supplementation among school-aged children is also a strong recommendation from WHO (22). There are still gaps in evidence for MMS among non-pregnant adolescent girls, but some emerging evidence is available from a large-scale cluster-randomised trial in Burkina Faso found that weekly IFAS or daily MMS alone was insufficient to effectively address anaemia (8,22). There are still gaps in evidence for MMS among non-pregnant adolescent girls, but some emerging evidence is available from a large-scale cluster-randomised trial in Burkina Faso found that weekly IFAS or daily MMS alone was insufficient to effectively address anaemia (8).

3.2 Evidence-building for integrated package of interventions to support efficacy of MMS and IFA interventions to reduce anaemia among non-pregnant adolescent girls

Addressing the multiple causes of adolescent anaemia may support increased efficacy of micronutrient supplementation interventions with MMS and IFAS, as noted in the study in Burkina Faso (8). Identifying the minimum intervention packages for various contexts (e.g. contexts of high disease burden, such as with malaria, soil-transmitted helminths, schistosomiasis and diarrhoea; contexts with high proportions of haemoglobinopathies, etc.) to reduce adolescent anaemia are needed, including the role of iron-containing supplementation like MMS and IFAS.

3.3 Non-invasive approaches to screen and monitor for anaemia (Rad-67)

Innovative, non-invasive approaches are available for measuring anaemia among adolescents without the complications of using blood samples (23). Where the prevalence of anaemia is high, community-based screening and monitoring of haemoglobin can facilitate early identification and referral of adolescents with moderate and severe anaemia and be used as tool for behaviour change.

3.4 Transitioning from IFAS to MMS

In the 2020 update of the WHO antenatal care recommendations for a positive pregnancy experience, WHO recommends the use of MMS containing iron and folic acid in the context of rigorous research and supersedes the 2016 WHO Antenatal Care guidance (24, 25). The WHO has recently added MMS to its list of essential medicines (26), enabling the facility of procurement and access in countries. Thus, there is a window of opportunity to develop contextualised delivery models of MMS, along with promotion of desired adolescent nutrition behaviours, to decrease adolescent anaemia and to improve outcomes for small and vulnerable newborns (27).

3.5 Leveraging school meals and the whole school environment for anaemia interventions

There is substantial evidence to suggest that regularly providing nutritious and safe meals via school-based programmes offers a range of benefits. These include not only alleviating short-term hunger but also addressing critical micronutrient deficiencies, including iron deficiency. This can be achieved through a multi-faceted approach that encompasses health and nutrition education, dietary diversity, fortification, and supplementation. Schools can also act as a platform for identifying referrals for children, adolescents and their families for social protection schemes and health services.

4. LEADING RESEARCH QUESTIONS AND PRIORITIES

4.1. What is the efficacy of MMS versus IFAS among non-pregnant adolescent girls?
4.2. What complementary interventions are necessary to bundle with micronutrient supplementation interventions to reduce adolescent anaemia?
4.3. What is the cost-effectiveness of these interventions for national policies and scale-up?
4.4. What are the practices, needs, and priorities of adolescent girls 10 to 24 years of age regarding their nutrition and facilitators and barriers (key determinants) to accessing and consuming an iron-rich diet?
4.5. What is the current status of adolescent nutrition interventions in schools, and what are the challenges and opportunities of these programmes?
4.6. Most adolescent nutrition programmes are delivered in schools. How can the whole school environment be leveraged to address adolescent anaemia, nutrition, and well-being in food-secure and insecure settings?
4.7. How can programmes effectively address anaemia among adolescent girls who do not attend school?
4.8. What are the differences in the acceptability and feasibility of MMS interventions compared to IFAS interventions and their effectiveness in decreasing anaemia among adolescent girls?

5. CALL TO ACTION

5.1. Invest in the collective will and investment of private and public sectors to implement policies addressing adolescent anemia to ensure Universal Health Coverage principles of equity and rights.
5.2. Accelerate research on the effectiveness and cost-effectiveness of MMS for adolescent girls living in low resourced and fragile contexts.
5.3. Invest in human-centered design approaches to contextualise and align interventions to adolescent girls' preferences, priorities, and needs.
5.4. Strengthen micronutrient supply chains to ensure the accessibility and utilisation of micronutrients among adolescent girls.

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