DELPHI CONSENSUS
ON
IRON DEFICIENCY ANEMIA
IN
PREGNANCY & LACTATION

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THE SOUTH SOUTH SOUTH CONSENSUS ON IRON DEFICIENCY ANEMIA

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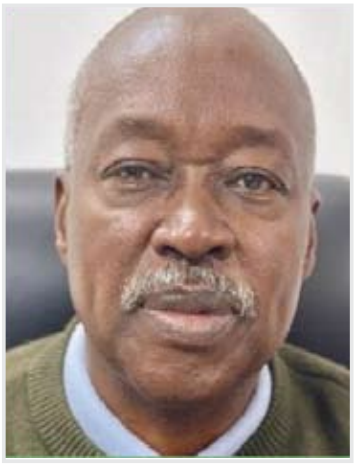
Message from Editors

Dr. Hrishikesh Pai
Trustee for Asia Oceania FIGO



Dr. Blami Dao
Trustee for Africa FIGO

Dr. Nestor Garello
Trustee for Latin America FIGO

Dear Colleagues,

It is with great pride and a sense of global solidarity that I present the DELPHI Consensus on Anemia—a vital international effort to address one of the most pervasive and under-recognized public health challenges of our time. Anemia, especially in women and children, continues to undermine health outcomes and developmental potential across the globe. To effectively confront this silent epidemic, we embarked on a comprehensive, multi-round DELPHI consensus process, bringing together the leading voices from the Asian, African, European, LAtin American and South American continents, with strong representation from FIGO and other key international stakeholders.

Through rigorous discussions and data-driven deliberations, this consensus reflects a rich blend of clinical expertise, regional insight, and shared commitment. The diverse perspectives contributed by experts from across these continents have resulted in guidelines that are not only evidence-based, but also culturally sensitive, scalable, and adaptable to healthcare systems with varying levels of resources.

This publication stands as a testament to what can be achieved through international cooperation and a unified vision. It is more than a clinical document—it is a strategic roadmap to strengthen screening, diagnosis, and treatment protocols for anemia across the life course, particularly in vulnerable populations.

I urge governments, health systems, and clinical leaders to embrace the recommendations set forth in this consensus and to act decisively. By doing so, we move one step closer to a world where no woman, child, or adolescent suffers needlessly from a condition that is both preventable and treatable. Together, let us reaffirm our global commitment to improving maternal and public health through early detection, proactive management, and equitable care.

With shared vision and unwavering commitment.

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Dr Blami Dao

Dr. Nestor Garello

Dr. Sunita Tandulwadkar

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Insights from Two Rounds -
Delphi Consensus on IDA in Pregnancy & Lactation

Round 1 at FOGSI South South Conclave 2025

FOGSI South South Conclave 2025, held in New Delhi on 10th April 2025, was led by Hrishikesh Pai and Blami Dao, FIGO Trustees for Asia-Oceania and Africa region respectively along with Sunita Tandulwadkar, Rishma Pai, Nandita Palshetkar, Suvarna Khadilkar and Hema Divakar. The Conclave witnessed the participation from 14 FIGO Member Societies (7 from Africa and 7 from Asia) for strengthening Afro-Asian Collaboration and the representatives were Abdulfetah Abdulkadir & Hailemariam S Abawollo (Ethiopia), Blami Dao (Burkina Faso), Ditas Cristina Duque Decena (Philippines), Farhana Dewan (Bangladesh), Hrishikesh Pai (India), Justus Barageine (Uganda), Litia Narube (Fiji), Sanath Akmeemana (Sri Lanka), Sarikapan Wilailak (Thailand), Saroja Karki Pande (Nepal), Sunday Dominico (Tanzania), SY Telly (Guinea), Victor Muela Difunda & Dieudonne Sengeyi (Congo) and Youssouf Traore (Mali). All the 14 representatives of FIGO Member Societies had an interactive session where each of the country's Vision, Challenges, Solutions and Initiatives in OBGYN were discussed.

The Conclave featured dynamic scientific program comprising of insightful speaker sessions, engaging panel discussions, and interactive round table meetings where Round 1 of Delphi Consensus on IDA in Pregnancy & Lactation took place. The participants were:

Delphi Consensus : Round 1 Participants

Leela Ambience, Gurugram, New Delhi - 10th April 2025

Editors	:	Dr. Hrishikesh Pai, Dr. Blami Dao
Co-Editors	:	Dr. Sunita Tandulwadkar, Dr. Rishma Pai Dr. Nandita Palshetkar, Dr. Suvarna Khadilkar Dr. Hema Diwakar
Convener	:	Dr.Pikee Saxena
Participants	:	Dr. Bhaskar Pal, Dr. Ajay Mane, Dr. Ashish Kale Dr. Deepak Bhagde, Dr. Dilip Gadhvi, Dr. Hemang Shah Dr. Madanjit Pasricha, Dr. Mahesh Gupta Dr. Monika Gupta, Dr. Priyankur Roy, Dr. Rajat Mohanty Dr. Rajnikant Contractor, Dr. Rashmi Kahar Dr. Shilpi Nain, Dr. Suman Yadav
Content Partners	:	Science Integra - S. Subramanian and Pragya Kahar

Round 2 - at FOGSI Femmtek V Conference 2025

FOGSI Femmtek V Conference - New Advances in Reproductive Medicine, Gynaecology & Obstetrics, held in Mumbai from 2nd-3rd August 2025, was led by Hrishikesh Pai FIGO Trustee for Asia-Oceania region and Néstor Garello - Trustee for Latin America along with Sunita Tandulwadkar, Rishma Pai, Nandita Palshetkar, Suvarna Khadilkar and Hema Divakar.
The 13 participants who attended from across the globe were Agnaldo Lopes da Silva Filho (Brazil), Giuseppe Trojano (Italy), Hani Fawzi (UK), Ismail Mete Itil (Turkey), Kenneth B Ruzindana (Rwanda), Muna Tahlak (UAE), Nestor Garello (Argentina), Okechukwu Ikpeze (Nigeria), Pere Bresco & Maria Degollada (Spain), Sambit Mukhopadhyay (UK), Stephen Rulisa (Rwanda) and Unnop Jaisamrarn (Thailand). The meeting brought together these 13 representatives from FIGO Member Societies in an engaging exchange, where they shared their respective country perspectives, including their vision, key challenges, proposed solutions, and ongoing initiatives in the field of OBGYN.

The Conference offered a rich scientific agenda with thought-provoking lectures, stimulating panel dialogues, and collaborative roundtable discussions, during which the second round of the Delphi Consensus on IDA in Pregnancy & Lactation was conducted. The participants included:

Editors	:	**Dr. Hrishikesh Pai, Dr. Nestor Garello**
Co-editors	:	**Dr. Sunita Tandulwadkar, Dr. Rishma Pai Dr. Nandita Palshetkar, Dr. Suvarna Khadilkar Dr. Hema Diwakar**
Convener	:	**Dr. Pikee Saxena**
Participants	:	**Dr. Hrishikesh Pai, Dr Rishma Pai, Dr. Nandita Palshetkar, Dr Anju Soni, Dr Surpiya Jaiswal, Dr Priti Kumar, Dr. Hara Pattanaik, Dr Abha Singh, Dr. Sambit Mukhopadhyay, Dr. Hani Fawzi (UK), Dr. Agnaldo Lopes da Silva (Brazil), Dr. Unnoop Jaisamrarn (Thailand), Dr. Isaimail Mete Itil (Turkey), Dr. Giuseppe Trojano (Italy), Dr. Maria Degollada (Spain), Dr. Pere Bresco (Spain), Dr. Stephen Rulisa (Rwanda), Dr. Nestor Garello (Argentina), Dr. Kenneth B Ruzindana (Rwanda), Dr. Muna A Tahlak**
Content Partners	:	**Science Integra - S. Subramanian and Pragya Kahar**

Iron Deficiency Anaemia in Pregnancy and Lactation: Delphi Consensus Statements

Abstract:

Background: Iron deficiency (ID) is the most prevalent micronutrient deficiency worldwide and the leading cause of anaemia. The World Health Organization (WHO) recognizes iron deficiency anaemia (IDA) as the most serious nutritional disorder of the twenty-first century, disproportionately affecting women. During pregnancy, prevalence ranges from 14% in industrialized nations to 35%–75% in developing countries. In India, the National Family Health Survey-4 (2015–2016) reported anaemia in 45.7% of urban and 52.1% of rural pregnant women. Despite global and national guidelines, gaps persist in the implementation of context-appropriate strategies.

Objective: To develop expert consensus recommendations on the screening, diagnosis, management, prevention, monitoring and follow-up, adherence, and health policies of IDA during pregnancy and lactation.

Methods: A modified Delphi process was conducted with a panel of internationally recognized experts in obstetrics and gynaecology to achieve consensus on best practices for the screening, prevention, and management of anaemia in pregnancy and lactation. Fortystatements across key domains were evaluated over two rounds. Panelists rated their agreement and provided feedback, and only statements with a unanimous consensus were retained.

Results: Of the 40 statements assessed, few progressed to Round 2, a few new statements were added in Round 2, and a total of 21 achieved final consensus (Grade U, 100% agreement). Strong consensus was reached on universal screening preconceptionally and during pregnancy, the use of HemoCue for point-of-care diagnosis, pragmatic algorithms in low-resource settings, initiation of treatment at serum ferritin <30 ×g/L, integration of system-level interventions such as supply chain strengthening and digital dashboards, and emphasis on patient education and adherence.

Conclusions: This Delphi consensus provides a consolidated set of 21 retained recommendations that balance global evidence with local feasibility. The consensus emphasizes universal screening, practical diagnostic and therapeutic strategies, patient-centred adherence approaches, and health systems strengthening. By integrating clinical care with policy-level interventions, these recommendations offer a feasible approach to enhance the effectiveness of national anaemia control programs and reduce the burden of maternal anaemia.

Keywords: Iron deficiency anemia, IDA screening, pregnancy and lactation, oral iron supplementation, ferritin, haemoglobin, Delphi consensus.

Introduction

ID is the most common micronutrient deficiency worldwide and remains the leading cause of anaemia.[1] The WHO recognizes iron deficiency anaemia (IDA) as the most serious nutritional disorder of the twenty-first century, disproportionately affecting women.[2]During pregnancy, IDA prevalence ranges from about 14% in industrialized countries to an average of 56% (35–75%) in developing nations.[3]

In India, the NFHS-4 (2015–2016) reported anaemia among 45.7% of pregnant women in urban areas and 52.1% in rural areas. In many developing countries, more than two-thirds of pregnant women are anaemic, with ID responsible for nearly 95% of cases. Additionally, up to 84% of women develop ID within the first postpartum week.[2]

Globally, IDA is a major contributor to maternal and fetal health risks, accounting directly for 20% of maternal deaths and indirectly for about 50% of maternal and feto-maternal morbidity. Oral iron therapy can increase haemoglobin by 0.3–1.0 g per week; however, its effectiveness is often limited by poor compliance (22–64%) due to gastrointestinal side effects. The development of IDA in pregnancy largely depends on maternal iron stores at conception and the amount of iron absorbed during gestation. In low-resource settings, pre-existing deficiencies and heightened physiological demands of pregnancy frequently exceed the maternal iron reserves, making supplementation an essential preventive strategy.[2]

The Delphi methodology is widely recognized as a qualitative approach for achieving consensus in areas where existing evidence is insufficient to resolve uncertainties. In light of the wide variation in clinical practice and the absence of uniform guidelines both in India and globally, a Delphi consensus exercise was undertaken with participation from gynaecologists and obstetricians. The objective was to formulate harmonized, evidence-informed recommendations for the screening, diagnosis, management, and prevention of anaemia during pregnancy and lactation.

Materials and Methods

Study design and expert panel selection

Given the limited high-quality evidence around diagnosis of ID/IDA, prevention, and management during pregnancy and lactation, a two-round Delphi technique was employed. The authors were provided adequate time to review the relevant literature and results of each Delphi round.

Members of the expert panel were selected based on the following criteria: practicing obstetrician–gynecologist with more than 15 years of experience;nationally and globally recognized experts in obstetrics and gynecology; considerable experience in the diagnosis, evaluation, and management of ID/IDA; previous experience as an advisory board member; and an editorial board member for a reputable regional journal.

In Round 1, the expert panel consisted of 15 experts of national and regional repute with vast experience in obstetrics and gynaecology, whereas in Round 2, the panel comprised 10 internationally recognizedexperts. Experts were asked to provide their perspectives on a series of questions in a Delphi survey related to various challenges associated with managing anaemia during pregnancy and lactation in different settings and rate their level of agreement. Topics included screening and diagnosis, prevention strategies, management during pregnancy, special populations and considerations, monitoring and follow-up, and patient education and compliance.

The Delphi survey questionnaireswere administered to the panel between April and August 2025 using Google Forms.

To finalize the consensus during Round 1, a physical meeting was held on April 10, 2025, where a consensus was reached onthe statements. The areas of consensus were identified, and any remaining differences in opinion were noted.

Similarly, to finalize the consensus during Round 2, a physical meeting was conducted on 4th August 2025, where consensus was reached for the statements.

Questionnaire development for Round 1 of the Delphi survey

The statements included in Delphi Round 1 were formulated based on a comprehensive review of the literature from the Medline via PubMed, Cochrane Database of systematic reviews, randomized controlled trials, non-randomized controlled trials, and cohort studies, and international guidelines was conducted. Full-text English-language articles published between 2018 and 2025 were retrieved from the databases using a combination of keywords such as: prevalence of iron deficiency anemia, IDA in pregnancy or pregnant women, anemia during pregnancy and lactation, prevention or prophylaxis, treatment or therapy, assessment or evaluation of iron status, iron supplementation or therapy, iron dose or dosage, guidelines, and consensus. Throughout the Delphi process and the drafting of this manuscript, the expert panel was provided with access to all related literature and materials.

All statements presented in Delphi Round 1, covered key domains such as screening and diagnosis, prevention strategies, management during pregnancy, special populations and considerations, monitoring and follow-up, and patient education and compliance.Each statement was accompanied by a free-text field, enabling panelists to elaborate on their responses and suggest additional statements for consideration in Round 2.

Questionnaire development for Round 2 of the Delphi survey

The outcomes of Round 1 were compiled and used to guide the development of the Round 2 survey. These results were also shared with panel members in Round 2, allowing them to revise their responses to statements that had not reached consensus in the previous round. Free-text fields were also provided in Round 2 to allow panelists to justify and expand upon their responses.

Grading of Statements

After two Delphi rounds, the level of agreement for each statement was evaluated and categorized using a predefined grading scale (Table 1):

Table 1. Grading system

Grade	Level of agreement	Description
Grade U	100%	Unanimous consensus
Grade A	90–99%	Near-unanimous consensus
Grade B	78–89%	Strong agreement with minimal variance
Grade C	67–77%	Moderate agreement
Grade D	<67%	Below consensus threshold

A supermajority rule was applied to determine consensus, defined as agreement by more than 67% of the expert panel on a given statement.

Round 1 consisted of 40 questionnaire items, answered by 13 expert panel members. Over the course of the Delphi rounds and the subsequent in-person consensus meeting, the expert panel removed 15 statements due to redundancy or conceptual overlap.

Our iterative changes throughout the process yielded 21 final statements, all with > 67% consensus, summarized in Table 1.

Results

A total of 40 statements were initially generated across domains of screening and diagnosis, prevention strategies, management, monitoring, patient education, and health system considerations. These statements were rated over two Delphi rounds.

In Round 1, all 40 statements were assessed, of which a few were carried forward for re-evaluation, and a few were newly added in Round 2. After structured discussion and re-rating, the statements that achieved unanimous consensus (Grade U, 100% agreement) were retained in the final set of recommendations.

Statements that did not reach the threshold of agreement were either omitted or dropped post-discussion, particularly those with moderate or conflicting evidence, operational challenges, or significant practice variability.

The progression of statements through each round of the Delphi process is presented in Table 1.

Table 1. Delphi results for statements on screening, prevention strategies and management of IDA during pregnancy and lactation

		Clarified statement	Round 1 rating	Round 2 rating	Grading
Statements on Screening and Diagnosis					
1	Universal screening should be recommended in all women for anaemiapreconceptionally and during pregnancy	Retained	100%	100%	U
2	Screening for IDA should be performed during all trimesters of pregnancy	Omitted in round 2	60%	-	D
3	Hemoglobin thresholds of Hb<11 g/dL in the first and third trimesters, and Hb<10.5 g/dL in the second trimester should be used to diagnose IDA during pregnancy.	Omitted in round 2	40%		D
4	For detecting IDA in low-resource settings, clinical signs and symptoms, hemoglobin with peripheral smear, CBC, and therapeutic trial of iron should be carried out.	Retained	70%	100%	U
5	Hemocue, Sahli's method, Rapid diagnostic ferritin kits, and Smartphone-based hemoglobinometers are the available point-of-care tests for IDA.	Omitted in round 2	70%	---	C
6	Hemocueshould be considered as the point-of-care testing method for hemoglobin estimation, as it has the highest accuracy and correlates best with laboratory standards.	Retained	70%	100%	U
7	Iron therapy can be started without Ferritin levels based on clinical judgment and hemoglobin levels.	Omitted in round 2	80%	----	B
Statements on Prevention Strategies					
8	Treatment for IDA should be initiated at serum ferritin level threshold of <30 µg/L in pregnancy.	Added in round 2	----	100%	U
9	All pregnant women should receive routine iron supplementation during pregnancy.	Omitted in round 2	90%	-----	A
10	Effective preventive strategies to be considered for early detection and management of IDA are: Community-based mass screening & awareness drives (e.g., schools, colleges) Nutrition education on iron-rich food, enhancers during ANC Public-private partnerships for supplementation and fortification Mass deworming programs , malaria prevention & treatment Micronutrient combinations (e.g., folic acid, B12 with iron) Media-based awareness via celebrities and influencers, roadshows Train frontline workers in anaemia classification, counselling, and referral	Added in round 2	----	100%	U

		Clarified statement	Round 1 rating	Round 2 rating	Grading
11	To ensure uninterrupted iron supplement supplies, states should consider: Implement logistics management information systems (LMIS) to track distribution from central warehouses to last-mile delivery points. Establish Buffer Stocks Decentralize Distribution Channels Capacity Building by training health workers on inventory management, timely requisitioning, reporting formats & quality assurance protocols Public–Private Partnerships (PPP) for bulk procurement and efficient transportation Ensure budget & include iron supplements as essential medicines under public procurement frameworks Digital anaemia dashboards and planning portals Mobile-based IFA consumption apps to monitor supplement distribution, identify defaulters, and enable data-driven supervision	Added in round 2	----	100%	U
12	The recommended dose of iron for prophylaxis in pregnancy for non-anaemic mothers in the Anemia Mukt Bharat initiative is60 mg elemental iron + 500 mcg folic acid	Omitted in round 2	60%	----	D
13	Routine supplementation of iron should be delayed until the second trimester.	Omitted in round 2	60%		D
14	Iron supplementation during the first trimester is associated with increased risk of nausea/vomiting.	Omitted in round 2	50%		D
15	Ganzoni's formula should be used to calculate dose of iron requirement.		80%		B
16	The practical use of the Mentzer index is to differentiate IDA from thalassemia.		80%		B
Management during pregnancy					
17	The preferred route of iron replacement in moderate to severe anemia is IV iron.		50%	--	D
18	The recommended duration of iron therapy in Anemia Mukt Bharat initiative is 180 days during pregnancy and 180 days postpartum.	Retained	80%	100%	U
19	IV iron should be considered when Hb<8 g/dL, the patient has a poor response to oral iron, is intolerant to oral iron, and late gestation with moderate anemia.	Omitted in round 2	90%	--	A
20	Contraindications to using IV iron in pregnancy are allergy to iron formulations, during the first trimester, and the presence of active infections.	Omitted in round 2	60%	--	D
21	Ferric carboxymaltose is the preferred IV iron preparation with respect to safety and compliance.	Omitted in round 2	90%	--	A
22	After IV iron therapy, oral iron can be initiated after 1 week.	Omitted in round 2	60%	--	D
23	The next Hb assessment should be repeated every 3-4 weeks until Hb> 11 g/dl, when the haemoglobin has increased from 7.8 to 9.8 in 3 weeks after giving IV.	Omitted in round 2	80%	--	B

		Clarified statement	Round 1 rating	Round 2 rating	Grading
24	Slower-than-expected rise in haemoglobin after oral iron therapy is usually due to vitamin B12/folate deficiency, haemoglobinopathy, or intake with calcium/phytates.	Omitted in round 2	80%	--	B
25	Blood transfusion in iron deficiency anaemia is indicated when haemoglobin is <6 g/dl, <7 g/dl with symptoms, or <8 g/dl in late pregnancy.	Omitted in round 2	70%	--	C
26	The expected rise in haemoglobin after one PCV transfusion is approximately 1 g/dL.	Omitted in round 2	80%	-	B
27	Oral iron therapy should be stopped at least 24 hours before initiating intravenous iron therapy.	Omitted in round 2	70%	-	C
28	Intravenous iron in pregnancy is indicated for women with moderate to severe anaemia who are non-compliant with oral therapy, those with poor response or intolerance to oral iron, or those with malabsorptive conditions impairing gastrointestinal absorption.	Omitted in round 1	-	100%	U
29	Parenteral iron should not be administered in early pregnancy, in patients with prior allergic reactions, active infections, abnormal liver function, or anaemia not caused by iron deficiency.	Omitted in round 1	-	100%	U
30	Pregnant women with severe anaemia (Hb<7 g/dL) should be considered high-risk and promptly referred to higher-level care facilities.	Omitted in round 1	-	100%	U
31	Treatment for iron deficiency anaemia in pregnancy should be initiated when serum ferritin is below 30 µg/L.	Retained	90%	100%	U
32	Combining multiple micronutrients, such as folic acid and vitamin B12, with oral iron is a rational treatment strategy for pregnant women with iron deficiency or iron deficiency anaemia	Retained	70%	100%	U
Special populations and considerations					
33	In women with pre-existing conditions, iron is avoided in thalassemia traits unless iron deficiency anaemia exists, and referral to a specialist is required.	Omitted in round 2	40%	-	D
34	Oral iron therapy should be continued for 180 days during pregnancy and 180 days postpartum.	Omitted in round 1	-	100%	U
35	Postpartum CBC testing is indicated for women with moderate to severe anaemia or those who had postpartum haemorrhage prior to discharge.	Omitted in round 2	80%	-	B
36	Women with moderate to severe postpartum anaemia should be administered parenteral ferric carboxymaltose (FCM) before discharge, and haemoglobin should be reassessed after 6 weeks to confirm correction of anaemia	Omitted in round 2	70%	-	C
Monitoring and follow-up					
37	Successful treatment and therapeutic trial of oral iron is defined by haemoglobin rise >1 g/dl in 2–4 weeks, rise in reticulocyte count within 5–7 days, improvement in symptoms, and haemoglobinnormalisation in 8 weeks	Omitted in round 2	80%	-	B
38	Reticulocyte response occurs post therapy at 5–7 days with oral iron, 3–5 days with intravenous iron, and 2–3 days after blood transfusion.	Omitted in round 2	90%	-	A
39	Post therapy, haemoglobin should be monitored at 2–4 weeks and ferritin at 6–8 weeks.	Omitted in round 2	60%	100%	U

		Clarified statement	Round 1 rating	Round 2 rating	Grading
Patient education and compliance					
40	Strategies to improve adherence to oral iron therapy include counselling on benefits and side effects, splitting the dose, addressing gastrointestinal side effects, providing reminders or aligning with routine activities, and use of adherence checklists.	Retained	100%	100%	U
41	Side effects of oral iron can be minimized by using lower doses (30–60 mg), taking tablets 1 hour after meals, avoiding interfering foods and medications (e.g., antacids, calcium, tea), alternate-day dosing, and changing formulation.	Retained	80%	100%	U
42	Deworming in pregnancy is done with a single dose of albendazole, preferably during the second and third trimester.	Omitted in round 2	80%	-	B
43	The first trimester poses the highest risk for irreversible neurodevelopmental effects in the fetus due to maternal iron deficiency anaemia.	Omitted in round 2	80%	-	B
44	Among forms of iron, sodium iron EDTA (NaFeEDTA) is considered the most suitable for fortifying staple foods to prevent iron deficiency and iron deficiency anemia. Ferrous sulphate, ferrous fumarate, or elemental iron can also be used for fortification, and the choice may also depend on the food vehicle and population.	Omitted in round 2	60%	-	D
45	After correction of anaemia, continuation of iron–folic acid (IFA) supplementation for 3 months is appropriate.	Omitted in round 2	60%	-	D
46	Anaemia prevention and management should be integrated into routine antenatal care, with haemoglobin assessed in each trimester.	Omitted in round 1	-	100%	U
47	After parenteral iron therapy, haemoglobinshould be reassessed at 4 weeks and ferritin at 4–8 weeks.	Omitted in round 1	-	100%	U
48	Low-dose daily iron supplementation (30–60 mg elemental iron) is effective and better tolerated than high-dose regimens (100–200 mg) for preventing iron deficiency anaemia in pregnant women.	Omitted in round 1	-	100%	U
49	Strengthening healthcare workforce capacity through training in screening, diagnosis, and management of iron deficiency anaemia should be a national priority.	Omitted in round 1	-	100%	U
50	National anaemia control programs should include measurable key performance indicators (KPIs), conduct quarterly reviews, and adopt adaptive strategies to enhance program outcomes.	Omitted in round 1	-	100%	U

Screening and diagnosis

Consensus was reached on several key statements regarding screening and diagnostic approaches for anaemia and iron deficiency anaemia (IDA) in pregnancy:

- **Universal screening** for anaemia was unanimously endorsed both preconceptionally and during pregnancy (100% agreement; **Grade U**).
- Although there was initial support for screening in all trimesters, this statement was omitted in Round 2 due to insufficient consensus (<67%; **Grade D**).
- For low-resource settings, experts achieved unanimous consensus that **clinical evaluation, hemoglobin measurement with peripheral smear, complete blood count (CBC), and therapeutic trial of iron** should be used to detect IDA (100%; **Grade U**).
- Among point-of-care tests, **HemoCuewas retained as the preferred method** due to its high accuracy and correlation with laboratory standards (100%; **Grade U**).

- Other proposed approaches such as Sahli's method, rapid diagnostic ferritin kits, and smartphone-based hemoglobinometers did not reach consensus and were omitted.

Prevention strategies

- Initiation of treatment for IDA at a **serum ferritin threshold <30 ×g/L during pregnancy** achieved unanimous consensus when introduced in Round 2 (100%; **Grade U**).
- A comprehensive set of **preventive strategies** such as community-based screening, nutrition education, deworming, micronutrient fortification, public–private partnerships, and media awareness campaigns was strongly supported (100%; **Grade U**).
- Similarly, **systems-based interventions** such as logistics management information systems (LMIS), buffer stock maintenance, decentralized distribution, capacity building, digital dashboards, and mobile-based IFA monitoring apps were unanimously endorsed (100%; **Grade U**).
- Routine universal iron supplementation in pregnancy and trimester-specific recommendations (prophylaxis dose, timing of initiation) failed to reach consensus and were omitted.

Management in pregnancy

- The **recommended duration of iron therapy** under Anemia Mukt Bharat, 180 days during pregnancy and 180 days postpartum, achieved unanimous consensus (100%; **Grade U**).
- Several statements related to intravenous iron use (indication at Hb<8 g/dL, preferred formulations, contraindications, and post-IV iron monitoring) did not retain consensus and were omitted in Round 2.
- The panel achieved unanimous consensus on broader statements:
- **IV iron is indicated in women with moderate to severe anaemia who are intolerant or non-compliant with oral therapy, or have malabsorptive conditions** (100%; **Grade U**).
- **Parenteral iron should not be used in early pregnancy, in women with prior allergic reactions, active infections, abnormal liver function, or anaemia not caused by IDA** (100%; **Grade U**).
- **Pregnant women with severe anaemia (Hb<7 g/dL) should be considered high-risk and referred to higher-level care** (100%; **Grade U**).

Monitoring and follow-up

- The statements on reticulocyte response timelines, post-therapy monitoring schedules, and criteria for successful oral iron trial did not retain consensus beyond Round 1.
- A retained consensus statement emphasized that after **parenteral iron therapy, Hbshould be reassessed at 4 weeks and ferritin at 4–8 weeks** (100%; **Grade U**).

Patient education and compliance

- Strategies to improve adherence to oral iron therapy—including counselling, side effect management, reminders, and adherence tools—achieved unanimous agreement (100%; Grade U).
- Likewise, measures to minimize side effects of oral iron—such as lower doses, alternate-day dosing, and avoidance of interfering foods/medications—were retained with unanimous consensus (100%; Grade U).

Special Populations and Postpartum

- Several statements relating to thalassemia traits, postpartum testing, and parenteral iron use in the postpartum period did not retain consensus and were omitted in later rounds.
- Unanimous consensus was achieved on:
  - » Continuation of oral iron therapy for 180 days postpartum (100%; Grade U).
  - » Postpartum women with moderate to severe anaemia should be prioritized for parenteral iron where oral therapy is not feasible (100%; Grade U).

Health systems and policy

- The panel reached a unanimous consensus on the need to **strengthen healthcare workforce capacity**,

integrate anaemia prevention into **routine antenatal care**, and include **key performance indicators (KPIs) with quarterly program reviews** to improve national anaemia control programs (100%; **Grade U**).

Discussion

This Delphi consensus exercise provides expert guidance on the screening, prevention, and management of IDA in pregnancy. From an initial pool of 40 statements, and after the addition of new statements, 21 reached unanimous consensus (Grade U, 100% agreement) after two iterative rounds. These retained statements highlight areas of strong agreement, while omitted statements reveal domains where evidence is insufficient, practices are diverse, or operational feasibility remains uncertain.

Screening and diagnosis of IDA

The consensus on universal screening for anaemia preconceptionally and during pregnancy underscores the recognition that anaemia remains highly prevalent among women of reproductive age in low- and middle-income countries (LMICs).[4,5]

This aligns with global strategies, including the WHO and Anemia Mukt Bharat guidelines, which advocate early detection as a cornerstone of prevention.[6]

While frequent screening may improve detection, resource limitations, competing priorities, and feasibility concerns may constrain its universal implementation.The retained recommendation supporting HemoCue as the preferred point-of-care diagnostic method is notable. HemoCue has consistently demonstrated high accuracy and reproducibility compared to laboratory standards, making it particularly valuable in decentralized or community-based settings. Older methods, such as Sahli's test, and newer but less validated approaches, such as smartphone-based hemoglobinometers or rapid ferritin kits, were omitted due to variable performance and lack of large-scale validation. This highlights a pragmatic preference for tools that combine accuracy with scalability.[7,8]

Another important retained recommendation was the emphasis on practical diagnostic algorithms in low-resource settings—including clinical evaluation, CBC, peripheral smear, and therapeutic trial of iron.[5]

This reflects recognition that while ferritin testing is the gold standard for diagnosing iron deficiency, it is not widely accessible in many primary care or rural facilities. The consensus therefore, prioritizes feasible and context-sensitive approaches.

Prevention of IDA

Initiating treatment when serum ferritin <30 ×g/L in pregnancy ensures early correction of iron deficiency before progression to anaemia.[9]

The panel focused on multi-level preventive strategies: community-based awareness, nutrition education, food fortification, micronutrient supplementation, deworming, and malaria prevention. The consensus also extended beyond clinical measures to systems-based interventions, such as logistics management information systems (LMIS), buffer stock maintenance, public–private partnerships, and digital dashboards. These interventions directly address supply-chain bottlenecks and ensure continuity of supplementation programs, which stock-outs and weak monitoring have been undermined.[10]

Interestingly, trimester-specific supplementation strategies (delaying supplementation until the second trimester or highlighting first-trimester intolerance) failed to reach consensus. This divergence highlights the gap between global recommendations and the realities of implementation, underscoring the need for more tailored, context-specific approaches.

Management of IDA in pregnancy

The panel reached clear consensus on duration of therapy (180 days during pregnancy and 180 days postpartum), reinforcing national programmatic guidelines. This is significant, as adherence to prolonged supplementation has often been poor, and consensus highlights the need for reinforcing compliance through counselling and system-level supports.[10]

The role of intravenous iron (IV iron) was one of the more debated areas. IV iron should be considered for moderate

to severe anaemia where oral therapy is not feasible due to intolerance, non-compliance, or malabsorptiveconditions, and it should be avoided in early pregnancy, allergy, infection, or non-IDA anaemias. This balance reflects both safety considerations and operational realities—given limited availability of IV formulations, inconsistent monitoring infrastructure, and cost differentials across health systems.[5]

Referral of women with severe anaemia (Hb<7 g/dL) to higher-level facilities was another area of unanimous consensus, reinforcing the need for timely escalation of care to prevent maternal and fetal complications.[11]

Monitoring and follow-up, patient education, adherence, and policies

The statement—reassessment of Hb at 4 weeks and ferritin at 4–8 weeks post-parenteral iron therapy—achieved consensus. Proposals for reticulocyte monitoring or frequent Hb checks were not retained, likely reflecting variability in laboratory access and resource constraints. This highlights a critical evidence gap and implementation challenge: while monitoring is essential for treatment efficacy, standardizing protocols across diverse health systems remains difficult.

One of the strongest areas of consensus was around patient education and adherence strategies. Experts unanimously endorsed counselling on benefits and side effects, addressing gastrointestinal intolerance, using adherence checklists, and setting reminders. These strategies help with addressing adherence,which is consideredas a major barrier in anaemia control.[9]

Consensus also emphasized practical strategies to minimize side effects of oral iron, including use of lower doses (30–60 mg), alternate-day dosing, and timing of intake to avoid food-drug interactions. This reflects an important shift from "high-dose supplementation" models toward tolerability-focused regimens, consistent with emerging evidence that lower, intermittent dosing may improve both adherence and absorption.[12]

Experts strongly emphasized integration of anaemia care into routine antenatal services, training of health workers, and embedding accountability mechanisms such as KPIs, quarterly reviews, and adaptive program strategies. These recommendations align with a broader shift toward health systems strengthening in maternal health programs.[10]

The major strength of this Delphi process was the structured methodology that ensured only statements with unanimous consensus were retained, lending to a robust final set of recommendations. The involvement of multidisciplinary experts across clinical, public health, and programmatic domains ensured that the retained statements are evidence-based, supported by national and international guidelines, and implementable.

Conclusion

The findings from this Delphi consensus balance global evidence with local feasibility, emphasize patient-centred care, and underscore the importance of systems strengthening. These consensus-based recommendations provide a practical framework for enhancing maternal anaemia control programs.

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