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SOUTH ASIA NUTRITION KNOWLEDGE INITIATIVE

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Supply- and demand-side factors influencing uptake of anemia interventions: *Systematic review of evidence from low-and-middle income countries*

About this note

This *Research Note* summarizes findings from a systematic review that included published papers and reports from 27 low-and-middle income countries on barriers and facilitators to uptake of interventions to address anemia. The findings from this review, could inform programs and policies across sectors to strengthen delivery and uptake of interventions for reducing anemia.

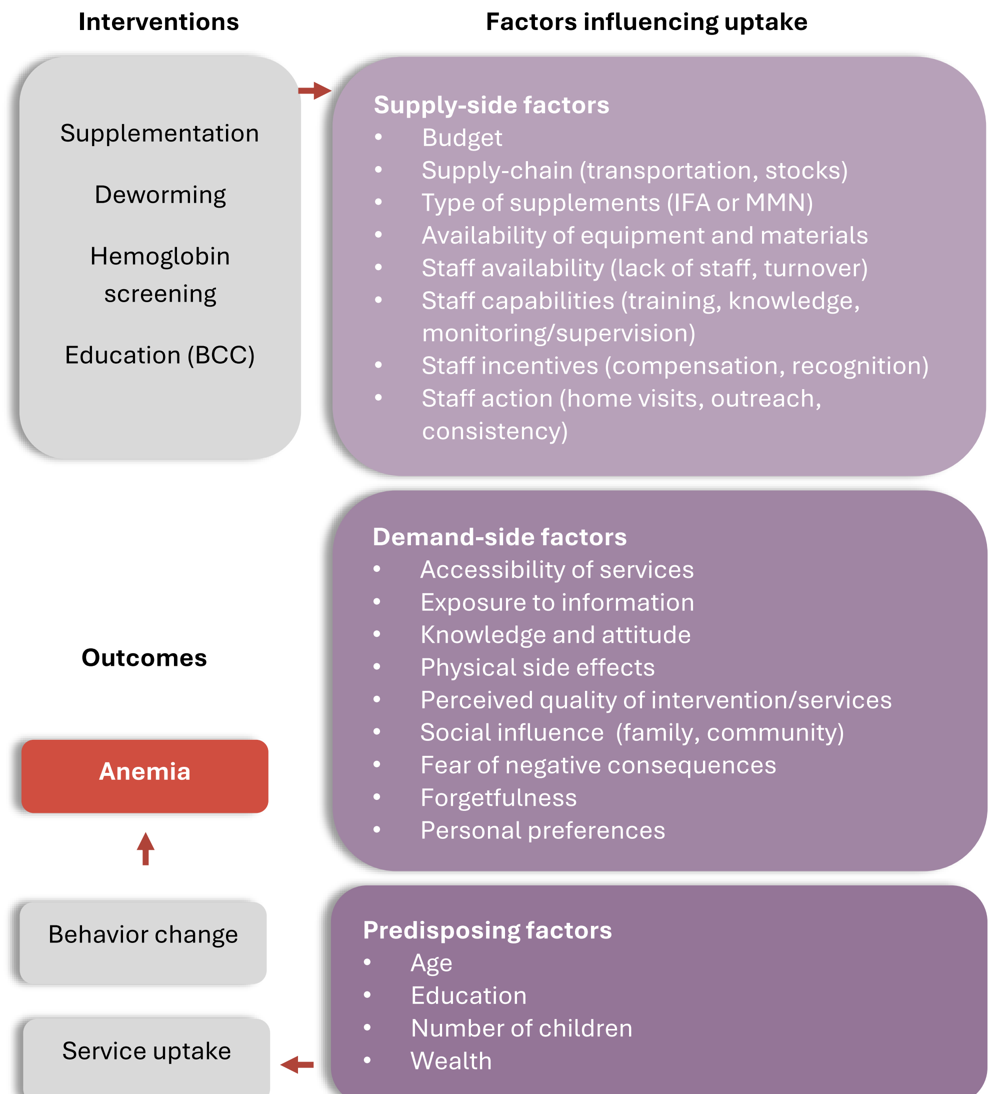


Figure 1. Conceptual framework of factors influencing uptake of anemia interventions.This framework illustrates how a set of supply- and demand-side factors, as well as predisposing factors at individual and household levels, can affect service uptake, behavior change, and finally anemia. Supply-side factors range from budget adequacy to supplies and staff. Demand-side factors include beneficiary access, knowledge, perceptions, and preferences. Predisposing factors such as education or household wealth can also influence service uptake, but are distinct from supply- and demand-side factors since predisposing factors cannot be immediately addressed by anemia control programs. All factors need to be taken into consideration to achieve positive effects on outcomes of interest.

Literature review methods

Steps in literature review

Step 1. Rapid scoping review | As a first pass, a rapid scoping review was conducted to identify existing reviews pertaining to the research question. Based on this exercise, it was decided that conducting a full systematic review was needed.

Step 2. Literature search | We developed a search strategy based on PICOS criteria **(see Table 1)** and searched the PubMed database in April and May 2023. A common search was conducted for several research questions, of which the research questions covered in this note were part. Articles published between January 2000 and April 2023 were considered. We searched the archives of relevant journals inclduing Lancet Global Health, WHO Bulletin, BMJ Global Health, American Journal of Clinical Nutrition, Advances in Nutrition, BMC Public Health, Journal of Nutrition, Plos One, Maternal and Child Nutrition, Public Health Nutrition, Health Policy and Planning. We also examined the following websites: WHO, Gates Foundation, Open Grey, Google Scholar, IFPRI, Nutrition International, Micronutrient Forum, UNICEF, Indian Council of Medical Research, World Food Programme, Anemia Mukt Bharat, and International Federation of Gynecology and Obstetrics.

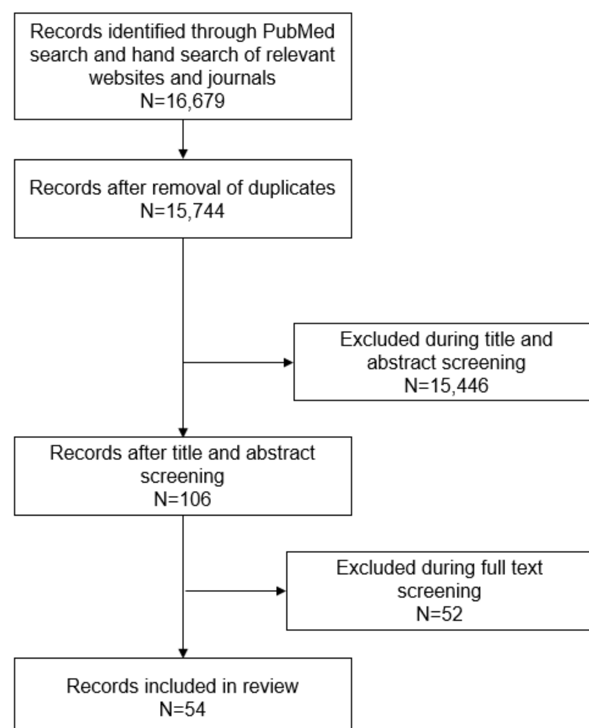
Step 3. Study screening | For screening, we used the *EPPI REVIEWER* software. Articles were initially screened on title and abstract. Articles which cleared the title and abstract screening were subsequently screened on full text. Two reviewers independently screened each article and any differences in screening outcomes were reconciled. The number of articles after each screening stage is shown in **Figure 2** Out of 54 articles, 38 contained information on barriers and facilitators and form the basis for summary in this note.

Step 4. Data extraction | Each article was independently coded by two reviewers who extracted information on characteristics of the study: (country, setting, study design, etc.), interventions (intervention type, channel, personnel involved in delivery, etc.), and outcomes (outcome categories, supply and demand-side barriers and facilitators). Additionally, reviewers extracted stakeholder quotes which were considered relevant for analysis.Extracted data are available upon request.

Table 1. PICOS criteria for study inclusion and exclusion

	Inclusion criteria
Population	1. Adolescent girls 2. Adolescent boys 3. Women of reproductive age 4. Pregnant women 5. Lactating women 6. Children (6-59mo) 7. Children (5y-9y) 8. Frontline workers /health workers 9. Other program level staff
Interventions	Demand side interventions: Behavior change communication, social marketing Health system interventions which are focused on: IFA supplementation (including micronutrient powder and multiple micronutrient supplements with IFA) Deworming Haemoglobin testing Behaviour communication change counselling
Comparison	Impact evaluations: Comparison group has to be a valid control group, which is a business-as-usual group Process evaluation: may not have a comparison group
Outcomes	Implementation outcomes: Barriers and facilitators at program, front line worker and beneficiary level.
Study design and methods	Impact evaluations: Completed evaluations with any evaluative component Experimental – Randomization Quasi-experimental –• Propensity Score Matching,• Regression Discontinuity Design • Difference-in-Difference with matching,• Instrumental Variables,• Multivariable panel regression with fixed effects,• Interrupted times series Completed process evaluations (qualitative and/or quantitative)
Other filters	2000-present; English language

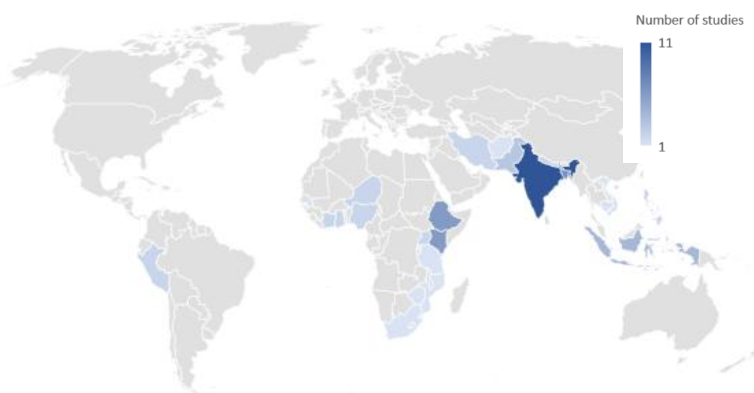
Figure 2. Screening flow diagram



Characteristics of included studies

Context and interventions of included studies

Figure 3. Locations of included studies



Most of the studies were either from the South Asia (n=22) or Sub-Saharan Africa (n=22) regions, with the remaining studies being from the East Asia and Pacific (n=7), South America (n=2), and Middle East and North Africa (n=1) regions. From the South Asia region, most studies came from either India (n=11) or Bangladesh (n=5). Of the 38 studies with contextual information available, 16 were conducted in urban areas, 11 were conducted in rural areas, and the remaining were conducted in both rural and urban areas. Pregnant women were the most studied group (n=30) followed by children below 5 years (n=18), women of reproductive age (n=11), and adolescent girls (n=8). Most studies had a single beneficiary group (n=44) while the remaining had two or more beneficiary groups. The most common interventions were iron folic acid (IFA) supplementation (n=43) and behavior change communication (n=29), often bundled with IFA supplementation. Multiple platforms were used to deliver these interventions including health facility visits (n=40), home visits (n=21), and schools (n=5). Community healthcare providers (n=43) and frontline workers (n=15) were the most common delivery agents for interventions.

Methods used by studies to assess barriers and facilitators

Most (n=43) studies used a qualitative approach while others (n=11) used quasi-experimental or experimental designs. A variety of data collection methods were used including surveying beneficiaries at multiple timepoints and conducting focus group discussion or in-depth interviews with beneficiaries (mostly women of reproductive age) or frontline workers. Respondents ranged from government officials to healthcare providers, school staff, school-going girls, pregnant women, fathers, mothers-in-law, and community leaders. The sample size of respondents varied widely, from a few individuals to nearly 7592 caregivers of children under five years old in one study.

Results - Supply-side factors

The most commonly cited factors were stocks of supplies (15 studies), staff availability (9 studies), and staff training and knowledge (13 studies). Several studies mentioned issues around transportation and infrastructure (4 studies), staff communication (4 studies), staff supervision (3 studies), staff compensation (4 studies), and staff consistency (5 studies) **(Table 2)**. These factors can either enable or hinder uptake of interventions, exemplified by the following illustrative quotes.

Stocks: *“There is no supplier who will supply you the order on time. This problem is always there in the supply chain. If we place an order we get it after 3 months.”* – District official, India[1]

Staff training: *“I understand why we were giving supplements to anaemic, but I did not agree with giving supplements to the healthy.”* -Community health worker, South Africa[2]

Communication: *“The blood enhancing tablets I take them because they are good in that they make it so we have enough blood in our body since this is what the healthcare worker said. Also what is promoted at the clinic are things that are good.”* – Pregnant woman, Zimbabwe[3]

Results - Supply-side factors (continued)

Table 2. Supply-side factors affecting implementation of interventions for addressing anemia

Factor	No. of studies reporting factor	Additional description of factor
Budget/resources	2[4,5]	Lack of budget for IFA
External support	1[6]	Support from external organizations
Transportation and infrastructure	4[1,4,7,8]	Supplements transportation issues; Poor infrastructure
Stocks of supplies	15[1–4,6–16]	IFA stockout; Poor stock estimation practices; Consistent supply and adherence to distribution protocol
Type/quality of supplement	11[7]	Low quality supplements
Staffing	9[6–9,12–14,18,19]	Lack of staff/staff turnovers; High workload/insufficient time
Staff training and knowledge	13[2,3,6–10,18,20–24]	Lack of training/need for refresher training; Trained and knowledgeable healthcare providers; Poor guidance for counselling materials
Communication	4[2,18,25,26]	Counseling on IFA supplementation
Staff supervision/guidance	3[5,8,13]	Lack of monitoring/supervision
Staff compensation	4[7,15,19,27]	Lack of compensation/reimbursement
Staff recognition	1[19]	Lack of/inadequate recognition
Home visits	1[18]	Provision of supplements through home visits
Community outreach	1[4]	Utilization of outreach sessions for IFA distribution Effective social mobilization
Consistency	5[4,9,14,15,28]	Monitoring of consumption Adherence to protocol distribution

Results - Demand-side factors

More than 20 studies discussed the importance of knowledge and attitudes (21 studies), physical outcomes (23 studies) or social influence (20 studies). More than 10 studies discussed accessibility of services (18 studies), exposure to information (15 studies), and personal routine (12 studies) **(Table 3)**. Fewer than 10 studies mentioned perceived quality of interventions/services (9 studies), interactions with providers (4 studies), and beliefs/personal preferences (4 studies).

Knowledge: *"The doctor advised me to eat well as there is less blood in me. Due to having less blood, there is going to be a problem with the delivery. He [the doctor] told me my blood has to be more than 11."*- Pregnant woman, India[29]

Perceptions: *"Elders in my house advised me not to take tablets, they think that the baby's brain development might get affected or baby might get some disability because of these tablets"*-Mother, India[30]

Forgetfulness: *"I eat very late if I am engaged in household work. So I forgot to take the tablets. Similarly, if there were attending any family function I forgot to take the tablet"*- Mother, India[30]

Results - Demand-side factors (continued)

Table 3. Demand-side factors affecting implementation of interventions addressing anemia

Factor	No. studies reporting factor	Additional description of factor
Accessibility of services	18[2–5,8,14–16,22,23,26,31–37]	• Inconvenient to access health services • Not utilizing ANC • Access to counselling on IFA • Regular visits to facilities distributing IFA (ANC, health centers, AWCs, etc.) • Able to access IFA (includes cost)
Exposure to information	15[2,3,5,8,12–14,17,20,24,29,33–36]	• No or inadequate information on IFA • Aware of counselling for IFA • Aware of programs distributing IFA • Information on IFA disseminated through mass media/community events • Awareness on anemia
Knowledge and attitudes	21[2,3,6,8,10,14,16,18,21–23,26,27,30,32–38]	• Fear of negative consequences • Aware of benefits of IFA • Knowledge, attitude, and perceptions on IFA
Physical outcomes	23[2,3,6–11,13,14,17,18,21,22,26,27,30,32–37]	• Benefits from medication do not meet expectations • IFA side effects • Tangible benefits from consuming IFA • Strategies to overcome side effects or side effects are rare
Perceived quality of intervention/services	9[3,12,15,16,18,27,30,33,36]	• Perceived poor quality of IFA • Trust in/comply with advice receiving through counselling • Characteristics of supplement (taste, combination, trust in brand, method of taking supplement) • Trust in health system
Interactions with providers	4[11,20,21,34]	• Negative interactions with healthcare providers • Regular home visits by CHW/FLW • Regular visits to facilities distributing IFA
Social influence	20[2–6,8,10,12–15,18,19,21,29,32,33,35,36,38]	• Negative Influence by family and peers • Ashamed to reveal pregnancy status • Family support for taking IFA • Community support for taking IFA • Community/beneficiary resistance
Beliefs and personal preferences	4[6,20,21,32]	• Perceived poor quality of IFA • Fear of negative side effects • Refusal to mix powder with food
Personal routine	12[2,3,9,11,14,18,26,30,32,34–36]	• Forgetting to consume IFA • Fixed time for taking IFA/reminder techniques

Key takeaways

1. Both supply- and demand-side factors must be considered for optimal uptake of interventions to reduce anemia (micronutrient supplementation, deworming, hemoglobin screening, behavior change communication).
2. Efforts are needed to strengthen frontline worker training, management of workload and motivation. These efforts will help ensure high-quality knowledge transfer to intended beneficiaries.
3. Beneficiaries must be able to access and trust local health services. They and their families should also be aware of anemia, its consequences, and the importance of micronutrient supplements such as IFA.
4. A clear and targeted behavior change communication strategy tailored to different beneficiary groups is essential for programmatic success.
5. More research is needed on specific population groups (e.g. adolescents) and on innovations to address implementation bottlenecks.

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