Data for Nutrition

Webinar

Can we measure that? A stepwise approach to design valid household survey indicators and questions about nutrition intervention coverage

06 August 2025 8 AM ET

Data for Nutrition

The Data for Nutrition (DfN) Community of Practice provides members with opportunities to share knowledge, experience, and questions relevant to **strengthening the nutrition data value chain** at all levels for the purpose of achieving better nutritional outcomes in low- and middle-income countries.

DfN has been active since 2019. In 2025, we have transition from a previous platform to a LinkedIn group to better connect, collaborate, and grow our community.

We are roughly 400 members on LinkedIn and growing!

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Today's Moderator

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Speakers

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Data DENT

Data for Decisions in Nutrition

Why do we need better nutrition intervention coverage indicators and measures?

Sunny Kim, IFPRI

Intervention coverage indicator (multi-sectoral nutrition)

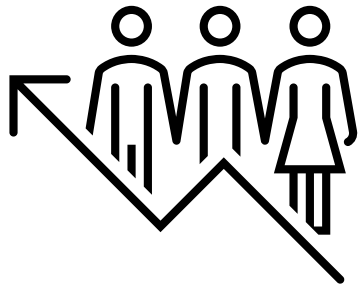
- **Definition**: Proportion of individuals in need of an intervention who actually receive it

- **Indicator:**

$$\frac{\text{\# Individuals in need and receive intervention}}{\text{\# Individuals need intervention}}$$

Why measure nutrition intervention coverage?

- **Track progress in evidence-based intervention delivery** at the country and global level towards national and global (SDGs) targets.
- Assess whether interventions are **reaching those that need it (equity)** and trends over time
- Program planning **prioritization**
- Performance-based **financing**
- Modeling efforts: assess **projected lives saved by certain interventions and health/nutrition benefits** of the programs



Countries use multiple data sources to monitor intervention coverage and quality; each is important for different purposes and types of decision-making

Household level

Facility level

UNIVERSAL PLATFORMS

Population-based surveys (periodic)

E.g.: DHS, MICS, National nutrition survey

Administrative data (routine)

E.g.: HMIS, DHIS-2

PLATFORMS USED IN SOME CONTEXTS

Community-level data (ongoing)

E.g.: *Community DHIS-2, CHW records*

Facility-based surveys (routine)

E.g.: SPA, SARA

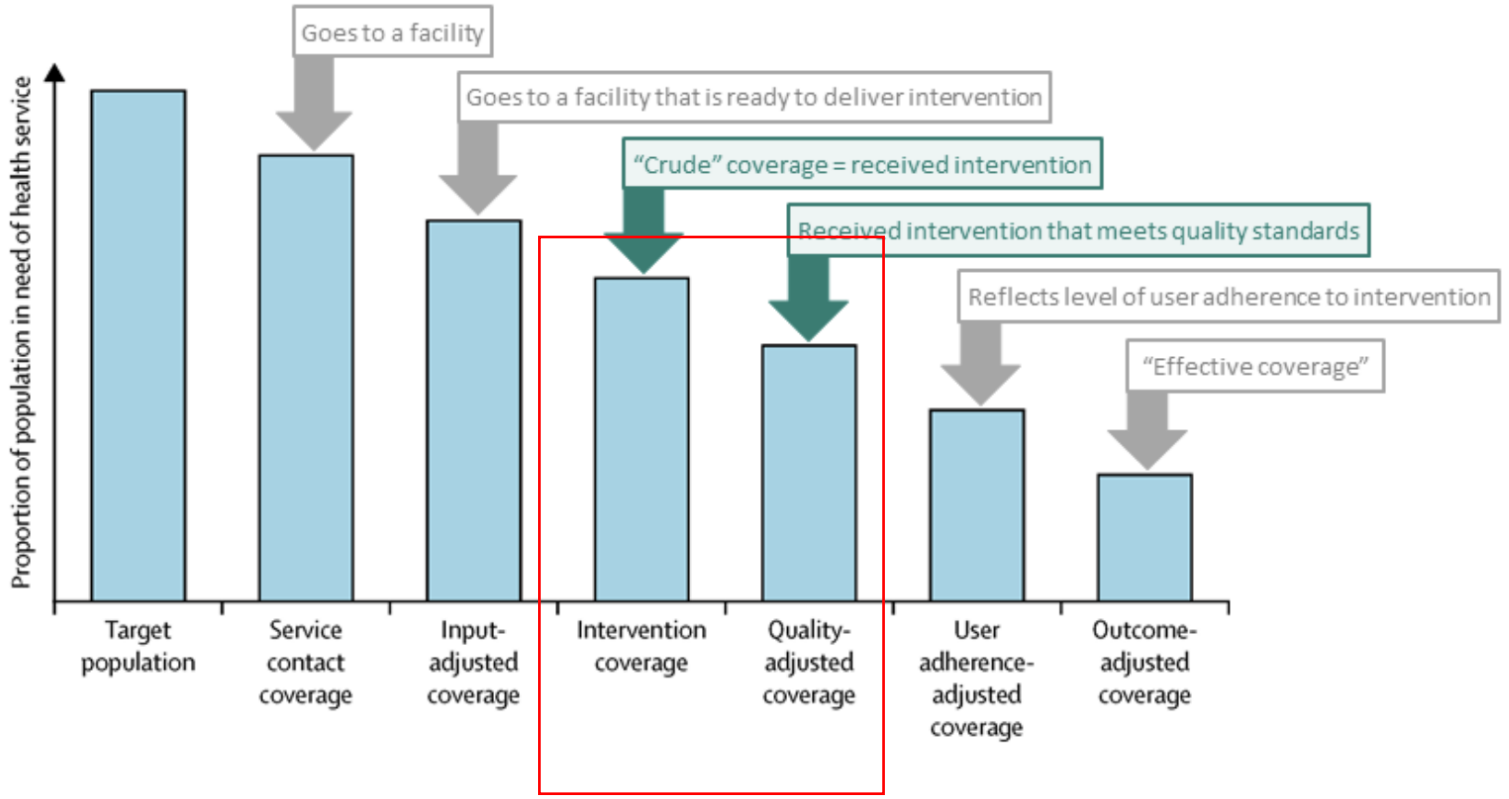
Why do we need better nutrition coverage measurement?

- Limited comprehensive, routine administrative coverage data across sectors for multi-sectoral nutrition interventions in LMIC settings
- High quality, actionable coverage data for all key nutrition actions is limited/not available. (e.g., WRA IFA supp, nutrition counseling during pregnancy, MAM, LSFF)
- Evidence of validity concerns with existing measures due to recall and reporting bias

What is a good population-based coverage indicator?

- Needs **representative** population-based measurement
- **Valid**: the extent to which the indicator is a true and accurate measure of the phenomenon under study
- **Reliable**: the extent to which indicator measurements are consistent and dependable across countries and over time
- **Ability to detect change** within a reasonable period and as a result of program implementation
- Ability to produce data that are **easily interpreted**; useful in guiding program change
- **Consensus-driven:** across global and national actors on key indicators and their components

Coverage indicators can include contact with the service provided to coverage that assesses quality/content of intervention



Heidkamp et al., 2021. DataDENT Blog: https://datadent.org/advancing-the-quality-of-care-measurement-agenda-for-nutrition/.

Creating an indicator

Coverage indicators need to summarize the **population covered** by the intervention and the **time period** to which the indicators apply.

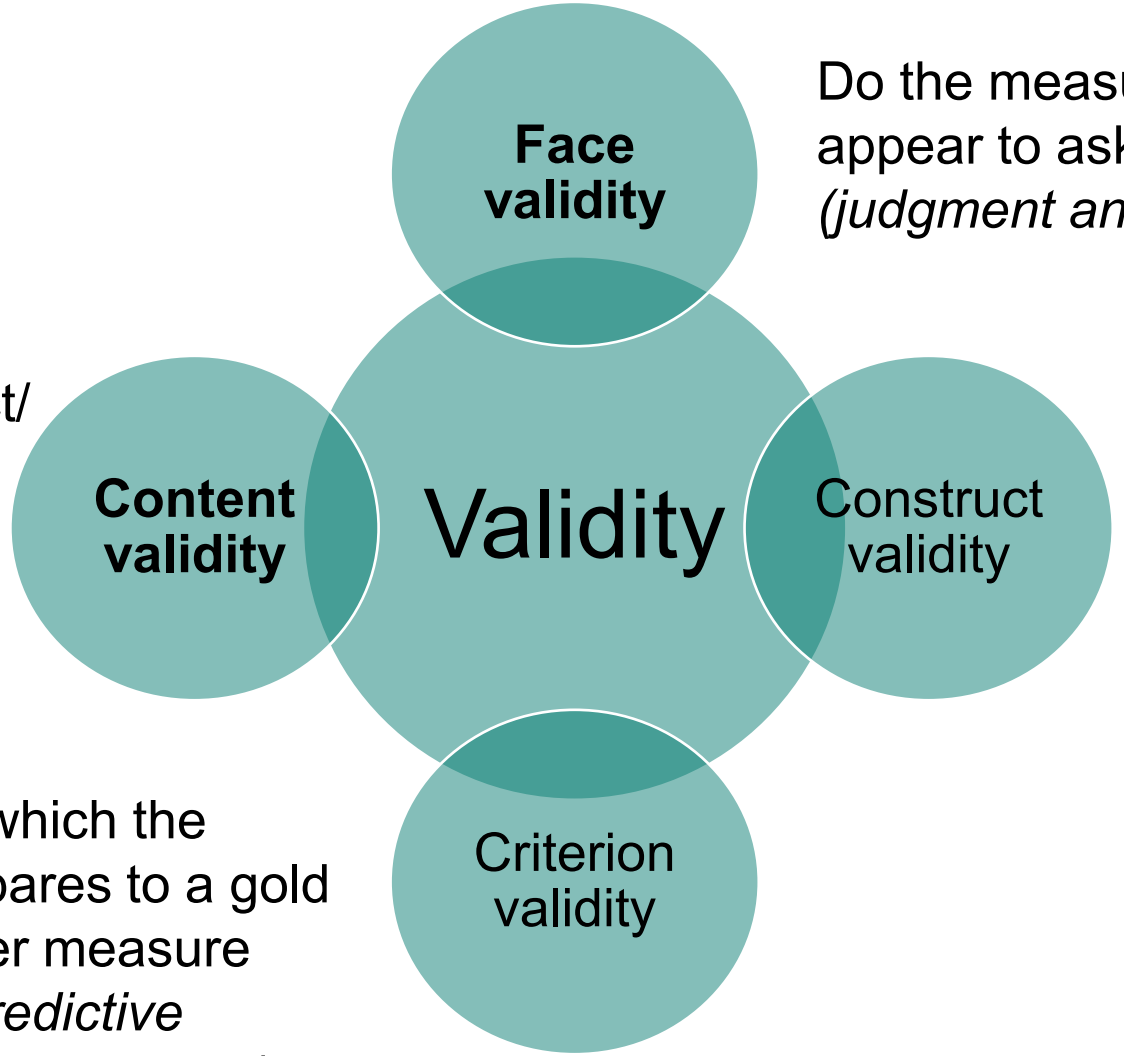
- **Denominator:** # of the population who meet the criteria to receive the intervention. *Can surveys accurately capture whether respondents needed the intervention?*

  Population: households, household members, specific groups (women, men, births, children)

- **Numerator**: # of the population who meet the criteria to receive the intervention and received the intervention. *Can survey respondents report accurately on whether they received the intervention?*

- **Time period:** The period preceding the survey to which the measure applies

Creating an indicator: validity



Do the measures ask what they appear to ask?
(judgment and non-expert rating)

Do the measures cover all the content of the construct/ concept under study?
(r*espondent, expert rating*)

Do the measures relate to the theoretical construct/ concept under study?
(relationship w/outcome, sensitivity across diff respondent groups)

The extent to which the measure compares to a gold standard/ better measure
(concurrent, predictive validity, validation studies)

Threats to validity for measurement coverage

- **Measurement error** (information error): errors that arise when the respondents do not know the exact answer to the survey questions but answer it anyway.
- **Bias** (information bias): arises from systematic (i.e., non-random) errors in measuring intervention coverage.
  - Recall bias, social-desirability bias

> **Measurement error** → higher variance, decreased precision of point estimate
>
> **Information bias** → overestimate or underestimate of the population point estimate. Problem is that one does not know which way this type of error is biasing the results.

- **Interpretation**: Coverage estimates should be interpreted at the administrative unit level they were designed to provide valid estimates for and not for lower levels. (e.g., interpreting coverage estimates at the district level when the survey was designed to yield national estimates only).

Reducing measurement error and bias

- Careful indicator measure development (**survey question**)
  - Define the indicator
  - Leverage mixed methods to improve the face and content validity of the question
  - Incorporate aids as needed
- **Extensive pretesting prior to survey implementation**
  - Adapt survey tools to local norms and context
  - Retain key structure of question to standardize indicators consistently across countries and over time.

Poll Question

Which of these are indicators of intervention coverage?
(select all the apply)

1. Exclusive breastfeeding 0-6 months of age
2. Infant young child feeding counseling for children 0-2 years
3. Vitamin A supplementation for children 6-59 months
4. Stunting among children <59 months
5. Deworming among pregnant women 15-49 years

Poll Question

Which of these are indicators of intervention coverage?
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3. **Vitamin A supplementation for children 6-59 months**
4. Stunting among children <59 months
5. **Deworming among pregnant women 15-49 years**

Step 1: Defining the intervention & context of implementation

Ellina Wood, JHSPH

Challenge: Defining the coverage of iron-containing supplements during pregnancy

Background: measuring coverage iron-containing supplements during pregnancy

- More than 23 countries are currently exploring introduction of Multiple Micronutrient Supplement (MMS) in place of iron and folic acid (IFA) in antenatal care (ANC) protocols
- Several countries are actively scaling MMS
- During the transition, it is important to identify who is being reached with IFA vs. MMS;
  - countries have not decided on longer-term changes to national monitoring indicators systems
- Measuring IFA coverage using HH surveys has been a challenge; common indicators measured using DHS questions have validity issues:
  - % women with birth in the previous 2-3 years who consumed any iron-containing tablets ***[VALID INDICATOR]***
  - % women with birth in the previous 2-3 years who consumed at least 90 iron containing tablets ***[NOT VALID INDICATOR]***
  - ***Cognitive burden, IFA coverage measurement complicated > MMS introduction further complicates***

Iterative indicator development process

- **Define the intervention**
- Define the use case for coverage indicator
- Review intervention policy / protocol guidance
- Identify key elements of intervention & delivery context for coverage measurement purposes

Draft Indicators

Design & test measurement tool

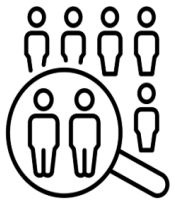
- Draft HH survey tools (e.g. questions & visual aids)
- Cognitive testing & refine tools

Refine indicators

- May need to edit so feasible to measure

Cross-cutting activities:

Consult



Formative Research

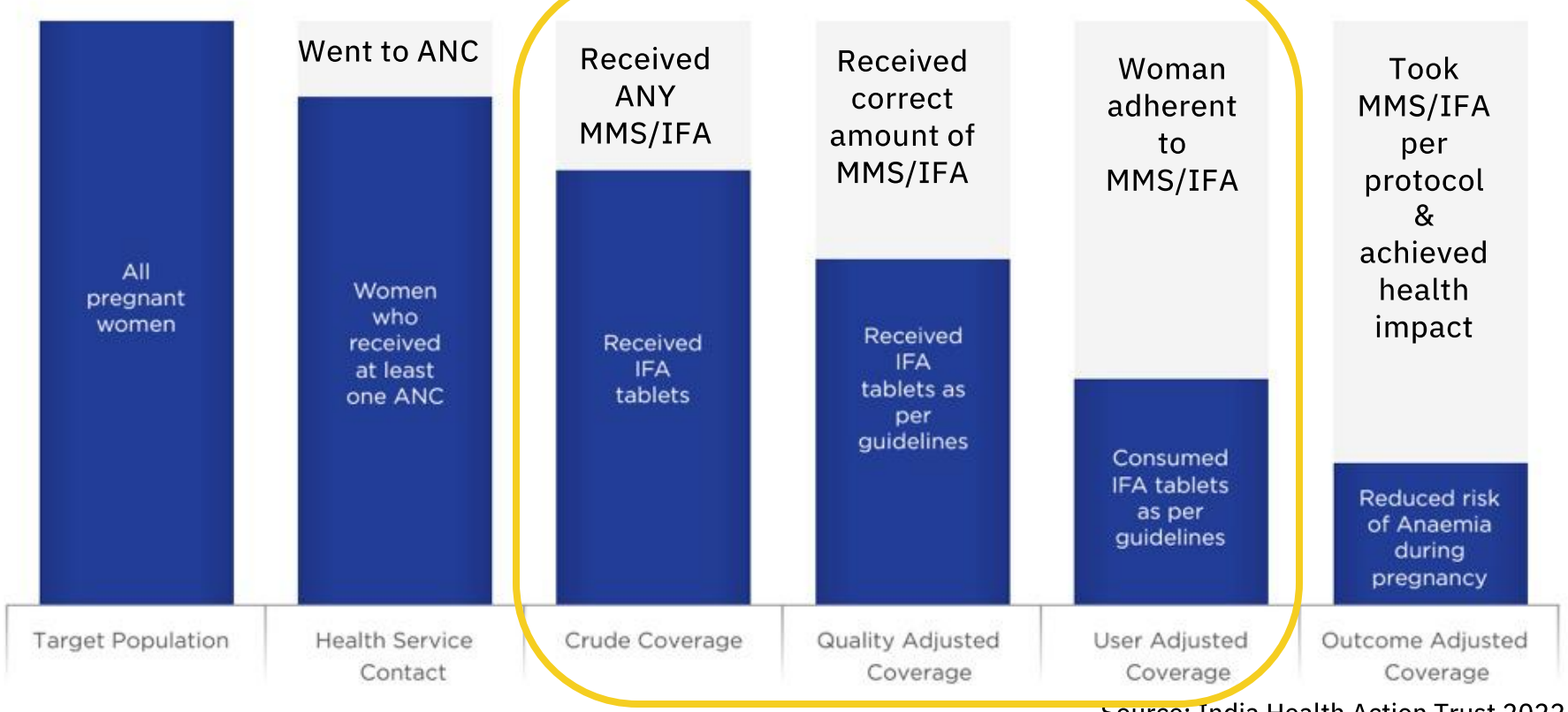
Use case: Need to identify where along the coverage cascade that is both useful to decision makers & feasible to measure

What is coverage?

The proportion of the population who should receive the intervention that actually do receive it

$$\frac{\text{\# who received}}{\text{\# who should receive}}$$

Figure 2: Health service coverage cascade for IFA: INDIA, NFHS-5, 2019-21



Source: India Health Action Trust 2022

KEY METHOD:

Landscaping of policy & programs actions

Review guidance: WHO guidance on iron-containing supplementation during pregnancy

Intervention	For Prevention		For treatment of anemia
	Iron-Folic Acid (IFA)	Multiple Micronutrient Supplements (MMS)	
WHO Guidance	*Recommended universally* for routine antenatal care, particularly in settings with high anemia prevalence.	*Context-specific use* where rigorous research exist, especially in LMICs, where micronutrient deficiencies are prevalent.	If a woman is diagnosed with anemia in a clinical setting
Composition & dose	2 essential vitamins and minerals 30-60 mg iron + 400 µg folic acid	15 essential vitamins and minerals UNIMMAP formulation: 30 mg iron + 400 µg folic acid + 13 others	2 essential vitamins and minerals 120 mg iron + 400 µg folic acid
Frequency	Daily supplementation	Daily supplementation	Daily supplementation
Duration	Throughout pregnancy, beginning as early as possible after conception	Throughout pregnancy, beginning as early as possible after conception	Daily until hemoglobin normalizes, then switch to preventive dose

Source: WHO antenatal care recommendations for a positive pregnancy experience & WHO Daily iron and folic acid supplementation in pregnant women

Note: there are other recommended iron supplementation interventions in non-pregnant WRA & adolescents (e.g. daily or weekly supplementation for prevention)

MN content, dose & distribution: there are many iron-containing supplements available to pregnant women in Bangladesh

What is the guidance in Bangladesh?

60 mg elemental iron + 400 µg folic acid daily throughout pregnancy and onwards until 90 days after delivery

Example

nts

Health Centers (Private & Public)

Community Health Workers

Pharmacy/ Markets

NGO Programs

Which of these will be considered as part of "coverage"?

Comparing content & dose of multivitamin products

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

Prenatal Composition	
Vitamin A	800 µg
Vitamin D	200 IU
Vitamin E	22.5 µg
Vitamin C	85 mg
Thiamin	1.5 mg
Riboflavin	1.7 mg
Niacin	18 mg
Vitamin B6	2 mg
Folate	800 µg
Vitamin B12	2.6 µg
Iodine	150 µg
Iron	27 mg
Zinc	15 mg
DHA	200 µg

According to Bangladesh's national policy, would a woman who took UNIMMAP and another who took Prenatal for 180 days be covered by the intervention?

What is the guidance in Bangladesh?

60 mg elemental iron + 400 µg folic acid daily throughout pregnancy and onwards until 90 days after delivery

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

Vitamin E	22.5 µg
Vitamin C	85 mg
Thiamin	1.5 mg
Riboflavin	1.7 mg
Niacin	18 mg
Vitamin B6	2 mg
Folate	800 µg
Vitamin B12	2.6 µg
Iodine	150 µg
Iron	27 mg
Zinc	15 mg
DHA	200 µg

Which Women is Covered?

01

Public Health Center

Obtained IFA at government health center & took IFA for 270 days be covered by the intervention?

02

Private Pharmacy

Obtained IFA at a pharmacy & took IFA for 270 days be covered by the intervention?

03

Multiple Products

Took IFA for 90 days & MMS for 180 days?

04

IFA for Treatment

Received iron tablets *only* as part of treatment for anemia?

Which Women is Covered?

01

Public Health Center

Obtained IFA at government h
& took IFA for 270 days be cov
intervention?

02

Private Pharmacy

A at a pharmacy & took IFA for
e covered by the intervention?

Where did the woman receive the supplement?

What is the composition of the supplement?

When did the woman start taking the supplement?

When did the woman stop taking the supplement?

How many did the woman take each day?

Did the woman take it daily?

03

Multiple Products

Took IFA for 90 days & MMS fo

04

IFA for Treatment

ved iron tablets *only* as part of
treatment for anemia?

What are the potential measurement challenges with differentiating between IFA & MMS that could influence indicator definition?

- MMS is not as visibly distinct as IFA (red tablet)
- Various MMS formulations available on the market → Variety of nutrients that each contain - all labeled as 'MMS'.
    - Beneficiary women may understand MMS as any type of iron-containing supplement, calcium, or prenatal vitamin that was given to them because they were pregnant
- Concept of multivitamin / MMS is not clear to women
    - Early roll out → low recognition of UNIMAPP MMS formulas
    - Wide range of other formulas→ how commonly are these consumed?

Examples of MMS Supplements

Examples of IFA Supplements

Step 2: Understanding context & how respondents conceptualize & recognize the intervention

Hanna Berhane, ACIPH

Iterative indicator development process

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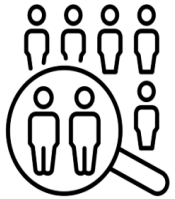


Formative Research

Challenge: How do women conceptualize and recognize iron-containing supplements?

Key questions when creating an indicator

- Can survey respondents report accurately on whether they received the intervention?
- What can be measured when a survey question is asked?
- What core components of an intervention are recognizable to survey respondents?

How do women identify iron-containing supplements?
(*can they report receiving the intervention?*)

Range of Iron-Containing Supplements

Forms: Tablets, capsules, liquid, fortified foods

Many of the supplements have similar packaging to other products

Lack of standardized naming

How Women Identify Iron Supplements

Labels & packaging cues
(e.g., "high iron," "anemia support")

Color coding & branding familiarity

Poll Question: What happens to our measurements if the women do not recognize IFA's?

Will have more:

a) False negative

b) False positives

c) Both are correct

Poll Question: What happens to our measurements if the women do not recognize IFA's?

Will have more:

a) False negative

b) False positives

c) Both are correct

How can we ensure we are asking the right questions using the correct terminology to describe iron-containing supplements?

- Use the locally recognized names:
  - What terms do health professionals/pharmacists' use when prescribing
  - Supplements may be referred to informally (e.g., "red pill")

- Understanding the terms and visual prompts used to differentiate the supplements:
  - Improves recognition
  - Enhances data accuracy in measurement tools

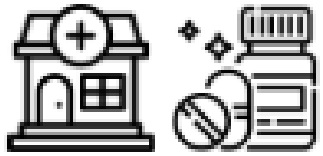
Ethiopia Formative Research: multi-step design in urban context (Addis Ababa)

Step 1 : Comprehensive Landscaping

Women Freelisting & Semi-structured Interviews

9 CPW
3 WDR

Healthcare Workers, Retail Staff, Pharmacy Freelisting & Semi-structured Interviews



11 sites

Women Pilesorting

9 CPW
5 WDR

Included higher SES/EDU women to captured breadth

Prioritized lower SES/EDU women

Pre-design questions

- How do women think about their own adherence?
- Do women recognize & practically distinguish between iron-containing supplements?

- *What terms do women use?*
- *What terms do they understand?*
- *What products are they exposed to?*
- *What products do they recognize?*

KEY METHOD:

Freelisting

What is Freelisting?

- Free listing is a qualitative method used to
  - Rapidly explore **how groups of people think is most important or how they define a particular** nutr/health-related **domain** by asking them to **list all the items that come to mind**
    - *Eg. When a woman in your community is pregnant, what products are they exposed to at a health center, pharmacy, or market?*
- Free listing
  - Is a relatively straightforward method
  - Offers swift insights into community practices and/or perceptions
  - Yields understanding of local languages and priorities while facilitating contextual comprehension

Method description

- **Select population**
- **Determine concepts to be compared or studied**
- **Sampling**
  - **Sample Size:** ~25-30 per subgroup for freelisting (until thematic saturation)
  - Stratify by SES, geographic area, facility vs. community-based sources
  - Collect background data: education, parity, facility access

Approach

- Example: Researchers ask participants to name all the items that come to mind in response to a prompt,
- ***"When a woman in your community is pregnant, what products are they exposed to at a health center, pharmacy, or market? "***

Free lister 1
1. Vitamins

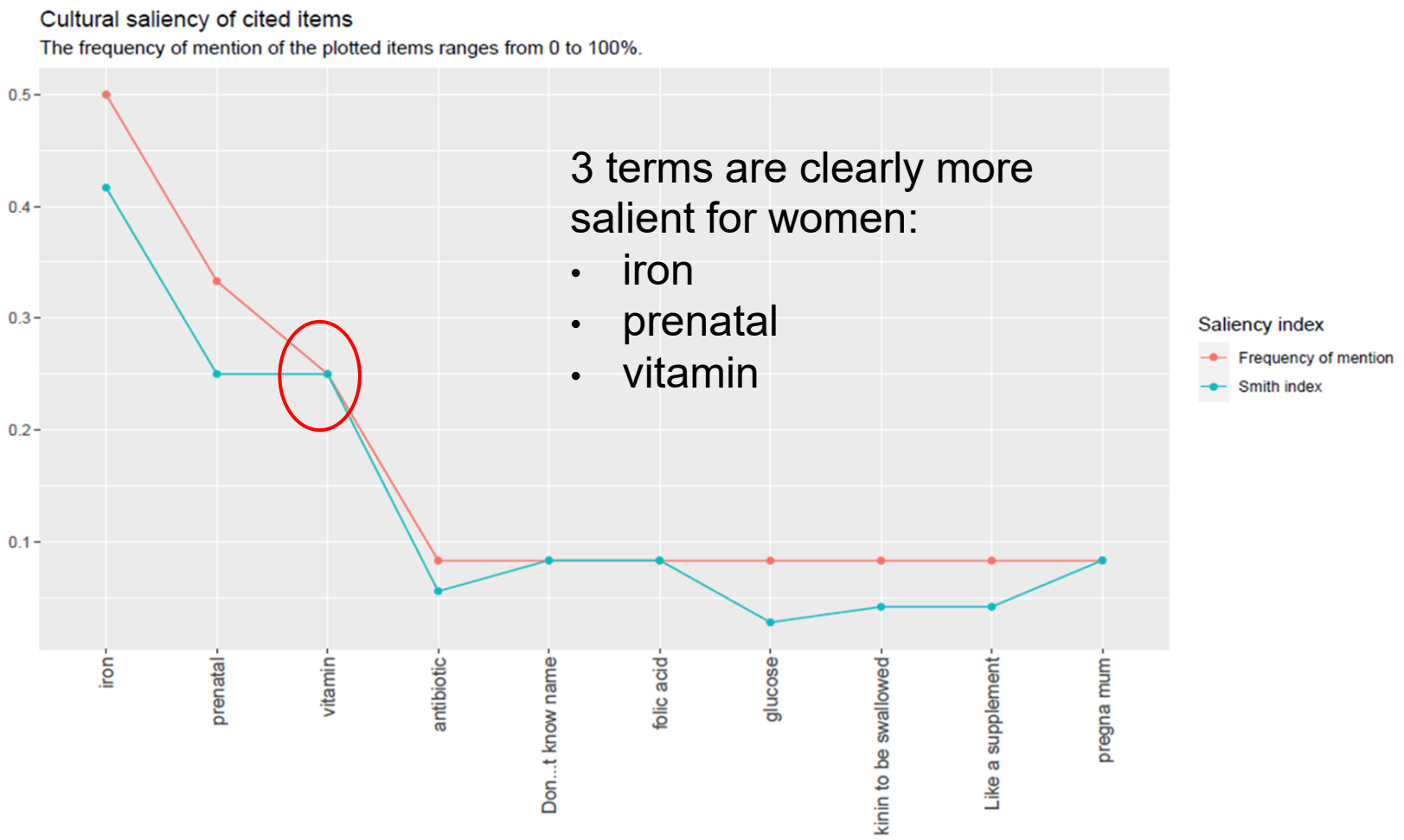
Free lister 2
1. Iron 2. Prenatal

Free lister 3
1. Iron 2. Vitamin 3. Prenatal

Free lister 3
1. Prenatal 2. Antibiotics 3. Glucose

Ethiopia Salience Results

Ethiopia Salience Results (Women only n=12)



Types and where micronutrients are accessed

- **Urban women access both IFA & MMS during pregnancy**
  - Higher SES women received IFA & purchased a variety of imported MMS (e.g. prenatal)
  - Some women at public facilities had received IFA & UNIMMAP repackaged in different ways
- **Where women seek ANC care affects the products they list:**
  - Government health centers provide a specific type of IFA
  - NGO health centers offer prenatal supplements
  - Private health centers write prescriptions for prenatals

Products Listed by all Subjects

	Total number of Products across all subjects	Average number of products per subject
Women (n=12)	10	1.8
Pharmacy Staff (n=8)	17	4.6
Health Care Workers (n=5)	10	3.4

Ethiopia Study: Insights from Freelisting

- Learn what matters most to people: the most frequently mentioned items or those listed early often reflect top-of-mind concerns or values
- Understand how people think and organize ideas: patterns in the listing hint at the values/cultural contexts
- Items that are both frequent and mentioned early across participants can be identified as culturally salient.
  - Understand the shared vs. individual views: Comparing lists across participants shows which ideas are widely held versus unique or divergent.
  - Example: variation by socioeconomic status (SES) and education level has been observed; therefore, adjustments to the next steps were made

Step 3: Designing and refining questions

Emily Myers, IFPRI

Challenge: Do you understand what I am asking you? Question iterative refinement to aid with comprehension of survey questions

What is cognitive interviewing?

- Qualitative method
- Assesses participants' understanding of survey questions
- Why conduct cognitive interviews (CI):
  - Improve content validity
  - Discrepancies between how questions are asked and interpreted can occur at any stage of the cognitive process
  - Identify potential sources of error
  - Maintain content validity across subgroups in a study

Hannan et al, 2019

Stages of the cognitive process

Cognitive stage	Definition	Errors	Causes
Comprehension	Interprets the question	Does not understand	Unknown terms, ambiguous concepts, long and overly complex questions
Retrieval	Searches memory for relevant information	Does not remember/know	Recall difficulty, questions assume respondent has information
Judgment	Evaluates and/or estimates response	Does not want to tell/cannot tell	Biased or sensitive questions, estimation difficulty
Response	Provides information in format requested	Cannot respond in format requested	Incomplete response options, multiple responses necessary

How do you discover the cognitive errors? Scripted probes

	Question	Response
Survey item	During your last pregnancy were you given or did you buy any vitamin tablet or syrup?	Yes = 1 No = 2 Don't know = 8
Cognitive probe: **Retrieval**	Can you explain to me the time period the question was talking about?	Open-ended response
Cognitive probe: **Comprehension**	I asked about "vitamin" in my question. Can you explain to me what "vitamin" means in your own words?	Open-ended response
Cognitive probe: **Judgment**	Was this question easy or difficulty for you to answer?	Open-ended response

How do you discover the cognitive errors? Scripted probes

	Question	Response
Survey item	During your last pregnancy, how many weeks or months pregnant were you when you first started taking a vitamin tablet or syrup?	Weeks [__][__] Months [__][__] Don't know = 98
Cognitive probe: **Response**	You said you started first started taking vitamins when you were __ weeks or months pregnant. How did you come up with the answer of __ weeks or months?	Open-ended response

ETHIOPIA SAMPLE RESULT: During your last pregnancy were you given or did you buy any vitamin tablet or syrup?

	Comprehension	Additional tests	Interpretation
“given” or “buy”	Given = well understood Buy = well understood		
“prenatal” or “folic acid”	Prenatal = not well understood Folic acid = not well understood		
“vitamin” or “iron”	Vitamin = mixed comprehension Iron = well understood		

ETHIOPIA SAMPLE RESULT: During your last pregnancy were you given or did you buy any vitamin tablet or syrup?

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“vitamin” or “iron”	Vitamin = mixed comprehension Iron = well understood	iron with many vitamins = well understood pill (kinin) for anemia = not well understood	

ETHIOPIA SAMPLE RESULT: During your last pregnancy were you given or did you buy any vitamin tablet or syrup?

	Comprehension	Additional tests	Interpretation
"given" or "buy"	Given = well understood Buy = well understood	None needed	• Distinguishing between an IFA and an MMS is challenging • Visual aids and using the same phrasing as local health facilities improved comprehension (HCWs called UNIMMAP "iron" or "pill (kinin) for anemia"
"prenatal" or "folic acid"	Prenatal = not well understood Folic acid = not well understood	iron or iron folic acid = well understood	
"vitamin" or "iron"	Vitamin = mixed comprehension Iron = well understood	iron with many vitamins = well understood pill (kinin) for anemia = not well understood	

Thank you for participating

We would like to send a special thank you to our speakers and panelists

A recording of the webinar is available now on the Data for Nutrition YouTube Channel. The recording link and presentation slides will be shared on the DfN LinkedIn Group:

https://www.linkedin.com/groups/13192578/

Thank you for joining today's webinar. We hope you enjoyed it!