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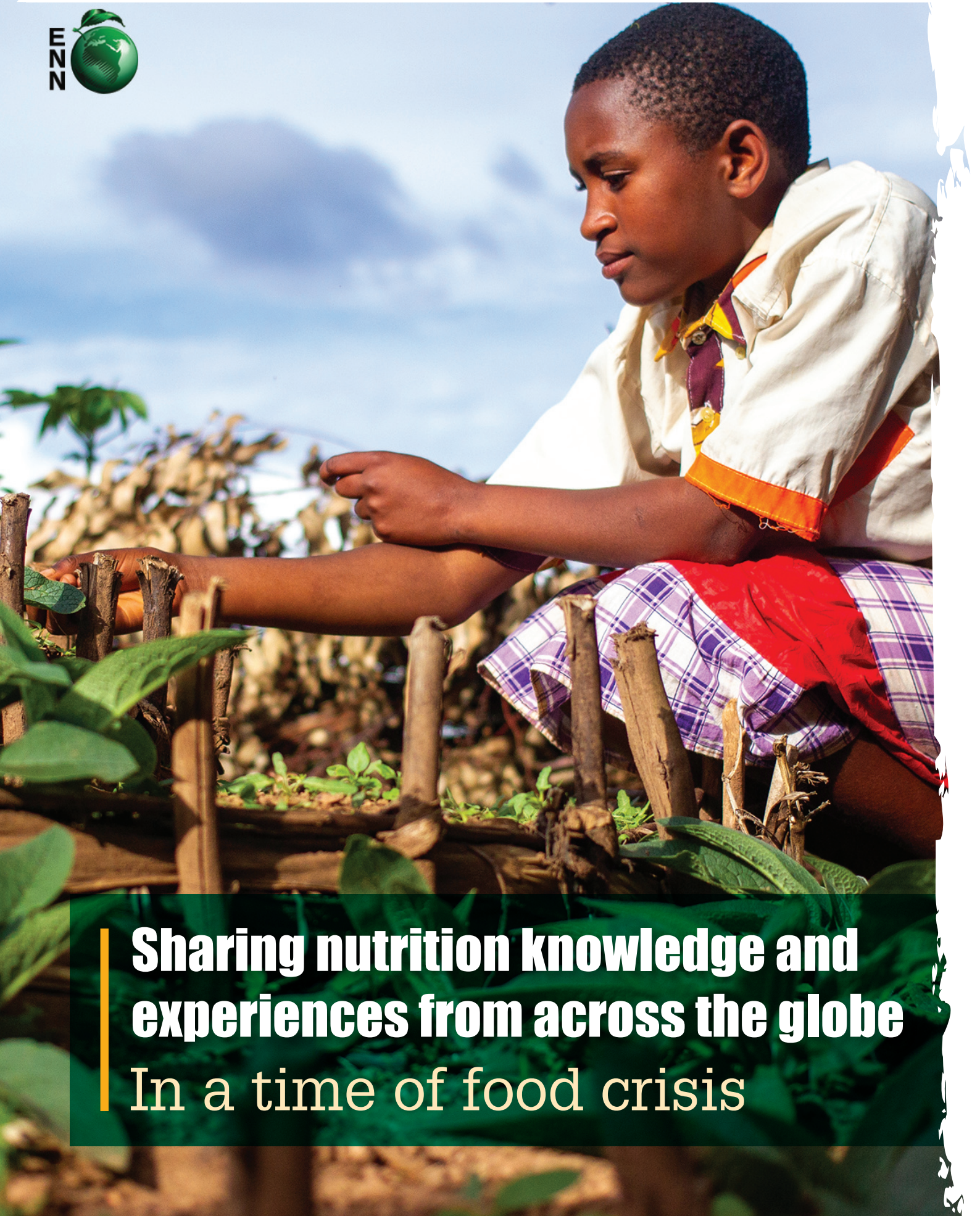

Sharing nutrition knowledge and experiences from across the globe

In a time of food crisis

Contents

Some thoughts on the passing of Professor George Patton

Myself and colleagues at ENN are deeply saddened at the passing of Professor George Patton.[1]

George really had a very special mind and a generous nature which combined to make him a fireball in the field of adolescent nutrition. I recently worked very closely with him on an opinion piece about measuring nutritional status in adolescents and colleagues at ENN worked with him on the recent Lancet Adolescent Nutrition Series.[2]

He was very influential in the world of adolescent nutrition, and after having worked closely with him, I could see why. He had a very unique way of thinking and had a way of understanding and communicating evidence that was incredibly effective and was not shackled by the norms of usual research communications. It was just a few months ago that he was hammering on at me about 'indicator constructs'! Something I had never considered before but came to realise were incredibly important to our work. He was also a huge advocate for youth engagement[3] and his immediate legacy is the progressive work that is still going on for the Lancet series as we speak.

Not only was he very good at progressing this neglected topic, but he was also very kind and generous with his expertise. He

seemed to always find time to provide guidance to developing researchers like myself, and was incredibly insightful and encouraging of ENN's work on adolescent nutrition more broadly.

Myself personally, ENN, and the wider nutrition sector will feel his absence greatly going forward, but he also already taught so much to so many of us. I know I will not be alone in taking forward all the many ideas he imparted to me, such as daring to think bigger, better and more strategically!

Natasha Lelijveld

[1] https://app.vision6.com.au/em/message/email/view.php?id=1674655&a=100037&k=vfkJi_ipfrZIr-XcWyjfT1Aw4z_O9Bm7BcZcQA6k8FU

[2] https://www.thelancet.com/series/adolescent-nutrition

[3] https://www.thelancet.com/campaigns/child-adolescent-health/youth-involvement

Editorial

Women handling chickens as part of a sustainable agriculture programme in Malawi

Dear readers,

A warm welcome to the 69th edition of Field Exchange in which we feature a varied selection of content from around the globe. After several special sections last year, this edition of Field Exchange is one of our general issues, and we highlight several articles which relate to something affecting us all: rising food prices constraining access to a healthy diet, on a global scale. In their cost of the diet analysis from Nigeria, **Rana et al** highlight how diverse, nutrient-rich foods may be available at local markets, but affordability is a key constraint on consuming adequate diets. Poor rural households included in the analysis had an annual shortfall equivalent to USD 1,650 in terms of being able to afford a diet that fully meets requirements for macronutrients and micronutrients within a culturally acceptable diet. **Angood et al's** overview of national social assistance programmes in Tanzania, Ethiopia and Burundi highlights how social protection systems can be critical in addressing economic constraints to achieving nutrient-rich diets when the cash transfer is delivered alongside additional programmatic elements, including social behaviour change.

Access to healthy diets is also affected by the availability of diverse foods. An article regarding Malawi, by **Corbett et al**, describes how applying a strong nutrition lens within the Farmer Field School approach – developed almost 25 years ago in Southeast Asia – resulted in participants being three times more likely than non-participants to meet their minimum dietary diversity requirement. Strengthening the integration of nutrition education within all agricultural value chain activities, the use of context-specific resources and adaptations, addressing gender norms and embedding market analysis were found to be key components to this success.

Pursuing an economic theme, the first published costing of integrated management of acute malnutrition (IMAM) in Indonesia, by **Trenouth et al**, provides valuable insights for the cost of scaling up IMAM services to achieve government targets by 2024. Modelling highlighted the relative cost-efficiency of focusing on scaling up treatment coverage in high-burden areas, as opposed to solely pursuing geographical coverage. This provides important programming guidance for where resources can be invested most efficiently.

As part of our regular featured content from the Global Nutrition Cluster, **Basquin et al** provide an update on their roll-out of emergency response preparedness (ERP) resources and support. Global challenges – climate change, which is fuelling conflict and food insecurity; the ongoing war in Ukraine, which has downstream impacts on food security, in addition to the more obvious geopolitical and humanitarian implications; and droughts, notably in the Horn of Africa and the Sahel – show that countries need to be increasingly prepared for emergencies. To date, the Global Nutrition Cluster has developed extensive ERP resources and tailored country support, yet uptake has been poor. More work is needed to understand why countries are not prioritising ERP and how to address these challenges, given the apparent and increasing need.

We follow on from our previous coverage on the **topic** of aggressive marketing tactics employed by commercial milk formula companies with three articles: **a summary of the Lancet 2023 series on breastfeeding**, and two articles from Cambodia by **Gnanaraj et al**. The authors highlight how improved internet access and increasing social media use have driven an exponential rise in digital marketing strategies, including for commercial milk formula products, and outline the threat this poses to optimal breastfeeding practices. In Cambodia, an update to the International Code of Marketing of Breastmilk Substitutes has been proposed to explicitly ban the digital marketing of commercial milk formula on social media and across the internet. The postscript to this article highlights the collaborative efforts between civil society and the government to progress this critical legislation.

In contrast, a field article from India by **Roy et al** portrays the potential impact of digital technology more positively, specifically exploring how it enabled communities to be reached with nutrition messages during the worst of the COVID-19 lockdowns. Digital counselling was shown to be a promising model to ensure messages on maternal, infant, and young child feeding and care practices reach their target audience, providing a complementary approach to critical interpersonal communication by frontline workers.

Finally, as usual, we feature an array of research snapshots, summaries and views, **one of which** offers us a gentle challenge to examine both the wording we use and the way we engage in calls to action for improving global health. Through this edition, we have refreshed our approach to summarising published research articles with a focus on breaking down some of the methodology and study limitations to provide more practical interpretation of findings. We hope you find this useful – do get in touch to let us know what you think and, as always, we welcome your reactions and experiences. Happy reading!

Anne Bush, *Editor*
Philip James, *Editor*

A call for content

Are you interested in writing for Field Exchange? If so, we are interested in hearing from you. We are currently welcoming submissions for our next two issues of the magazine, which will be general issues. We are particularly interested in covering emergency contexts and are also eager to review submissions regarding food systems. However, we are open to article ideas from across the nutrition sector. If you have a story to tell about a nutrition challenge in your region or a programmatic insight to share with your peers, please do reach out to us at **fex@ennonline.net** with a brief abstract covering your idea. Please visit **https://www.ennonline.net/fex/writeforus** for more information.

The World Health Organization's Nutrition Data Portal

Data analysis with WHO and collaborators

©WHO

Launched in 2022, the World Health Organization (WHO)'s Nutrition Data Portal provides access to multiple nutrition and related indicators. The interactive portal allows the user to visualise key indicators and country profiles, providing data search tools for easy navigation. The webpage currently comprises of three nutrition databases, further subdivided into smaller segments with more granular data.

Micronutrients database: This database is an interactive platform collecting data published in reports and manuscripts on the micronutrient status of populations representative at the national level. The micronutrients database was first developed as part of the Vitamin and Mineral Nutrition Information System in 1991. After a comprehensive evaluation, the database has now been upgraded and expanded. The database now includes 40 indicators of the status of 17 micronutrients or micronutrient-related conditions, covering both deficiency and excess. The database is searchable by micronutrient, country and population group.

Child growth and malnutrition: This database comprises population-based surveys that fulfil a set of criteria. Data are checked for validity and consistency, and raw datasets are analysed following a standard procedure to obtain comparable results. The Global Database on Child Growth and Malnutrition, established in 1986, compiles, standardises and disseminates child anthropometric data from nutrition surveys conducted globally based on the WHO Child Growth Standards. Data are sourced from the Joint Child Malnutrition Estimates collaboration between WHO, UNICEF and the World Bank.

Nutrition landscape information system (NLiS): This database brings together all existing WHO Global Nutrition Databases dynamically, as well as other existing food and nutrition-related data from partner agencies. NLiS is a web-based tool that provides nutrition and nutrition-related health and development data in the form of automated country profiles and user-defined downloadable data. Sources include WHO, UNICEF, the UN Statistics Division, the UN Development Programme, the UN Food and Agriculture Organization, Demographic and Health Surveys, the World Bank, the International Food Policy Research Institute and the International Labour Organization.

Collectively, the portal offers easy-to-use functionality and allows users – such as researchers, health practitioners, policy-makers or even citizen scientists – access to a rich source of nutrition data free of charge.

For more information, please explore the portal at **https://platform.who.int/nutrition/nutrition-portals**

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Free course: Operational research for humanitarians

The University of Geneva has recently launched a massive open online course (MOOC) for humanitarian professionals and early career researchers from any sector. The course, taught in English (through an estimated 16 hours of self-learning), does not require any prior knowledge and provides learners with the fundamental skills to handle humanitarian research concepts and methods. It aims to make humanitarian action more evidence-based. It features flexible deadlines, and the University of Geneva provides a shareable certificate of attainment upon completion.

The course has been developed by the Geneva Centre of Humanitarian Studies, in partnership with Aga Khan University, Pakistan, and the International Committee of the Red Cross (ICRC). It aims to build a bridge between research and practice. The syllabus covers important questions, such as how can research be used for humanitarian practice? What are the most appropriate research methods in these contexts? How can I judge the quality of the evidence in question? Is evidence applicable to the context I work in? How can populations in a situation of vulnerability be protected during a study? The MOOC is designed as a five-week learning journey with alternating videos, quizzes, exercises and assignments.

Users can enrol for free at any time and access content from expert instructors: Karl Blanchet, Faculty of Medicine, University of Geneva; Francesca Grandi and Emilie Venables, ICRC; Sameen Siddiqi, Maleeha Naseem, and Jai Das, Aga Khan University, Karachi; and Benjamin Schmid, Geneva Centre of Humanitarian Studies, University of Geneva.

For more information about the course, as well as information about enrolment and the syllabus, please visit **https://www.coursera.org/learn/research-humanitarian**

en-net summary

En-net[1] is a free, open resource for frontline nutrition practitioners to gain access to prompt technical advice for operational challenges where answers are not readily accessible. This article summarises some of the key en-net posts and debates between September 2022 and February 2023.

Over the past six months, 53 questions have been posted on en-net. The management of acute malnutrition/wasting was the most active forum area (with 16 questions posted), followed by assessment and surveillance (13) and infant and young child feeding (11).

The question that generated the most discussion on en-net focused on concern about non-evidence-based guidance regarding breastfeeding and cholera.[2] Breastfeeding is protective against cholera because it boosts an infant's immune system and eliminates the risks of contaminated water, both directly and when mixed with formula, and breastfeeding is advised during cholera treatment and recovery. Some guidance advised mothers with cholera to wash their breasts with soap and warm water or even disinfectant before breastfeeding. The discussion has resulted in an update to the Interim Technical Note for Treatment of Cholera in Pregnant Women,[3] which reiterates that breastfeeding should always be encouraged and, for mothers with cholera who are in a treatment centre with a neonate, to wash their breasts if there is reason to believe they have come into contact with stool or vomit. The update also warns that any erecting of barriers to breastfeeding should be evidence-based and applied only on a case-by-case basis, given the overwhelming importance of breastfeeding for child health and development. Similarly, a large number of responses were posted to a question seeking evidence of donations of breastmilk substitutes during the 2023 Türkiye Syria earthquake response, with en-net users sharing numerous examples.[4]

A concern was raised on en-net regarding the short-term and medium-term consequences of consuming ready-to-use therapeutic food for healthy infants.[5] En-net users shared evidence on the post-discharge body composition of children treated for wasting, which broadly showed that ready-to-use therapeutic food does not lead to excessive fat gain (Binns & Myatt, 2018; Lelijveld et al, 2021; Fabiansen et al 2017). A similar discussion was had on whether rapid rehabilitation of severe wasting increased the risk of non-communicable diseases in later life,[6] sparked by a study based on the care of wasted children before the invention of ready-to-use therapeutic food. En-net users shared research that found that children with severe wasting did not deposit excess fat following treatment with ready-to-use therapeutic food at standard doses in an outpatient setting (Binns & Myatt, 2018). En-net users also argued for the need to prioritise immediate survival, healthy growth and development.

Other questions that generated a high level of engagement on en-net included the use of mid-upper-arm circumference in children under six months of age;[7] how to correctly interpret height-for-age in populations over five years of age;[8] how to manage a moderately wasted child with signs of a vitamin A deficiency;[9] and how to handle 'don't know' entries or missing data when creating dietary diversity indicators, such as minimum acceptable diet.[10]

To join any discussion on en-net, share your experience or post a question, visit **https://www.en-net.org/** or **https://fr.en-net.org/default.aspx**

For any feedback on en-net, please contact **https://www.en-net.org/**

1 **https://www.en-net.org/question/4816.aspx**
2 See the discussion at **https://www.en-net.org/question/4690.aspx**
3 See the guidance note at **https://www.gtfcc.org/wp-content/uploads/2020/11/gtfcc-interim-technical-note-treatment-of-cholera-in-pregnant-woment-1.pdf**
4 See the discussion at **https://www.en-net.org/question/4791.aspx**
5 See the discussion at **https://www.en-net.org/question/4713.aspx**
6 See the discussion at **https://www.en-net.org/question/4762.aspx**
7 See the discussion at **https://www.en-net.org/question/4789.aspx**
8 See the discussion at **https://www.en-net.org/question/4692.aspx**
9 See the discussion at **https://www.en-net.org/question/4797.aspx**
10 See the discussion at **https://www.en-net.org/question/4714.aspx**

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Fabiansen C, Yaméogo CW, Iuel-Brockdorf AS et al (2017) Effectiveness of food supplements in increasing fat-free tissue accretion in children with moderate acute malnutrition: A randomised 2 × 2 × 3 factorial trial in Burkina Faso. PLoS Med, 11, 14, 9, e1002387.

Lelijveld N, Musyoki E, Adongo SW et al (2021) Relapse and post-discharge body composition of children treated for acute malnutrition using a simplified, combined protocol: A nested cohort from the ComPAS RCT. PLoS One, 3, 16, 2,

Tools for Infant and Young Child Feeding in Emergencies (IYCF-E)

Like any area of work within the field of nutrition, Infant and Young Child Feeding in Emergencies (IYCF-E) relies heavily on a comprehensive suite of reliable resources. The IYCF-E Hub aims to deliver such a suite in the form of a global portal for accessing a collection of relevant resources for use in humanitarian contexts. The Hub offers advanced search functions to appropriately seek out relevant information, while organising resources by collection – such as the Ukraine war response, the Türkiye–Syria earthquake response and the assessment of needs, orientation and training, to name a few. In each collection, both visual and text-based resources can be discovered from a wide variety of reputable international and local organisations active in the area. Where relevant, tools translated into local languages are included.

The platform has been developed by Save the Children, with the support of the members of the Steering Advisory Group and funding from United States Agency for International Development.

For more information regarding the IYCF-E Hub, and to access the resources for yourself, please visit **https://iycfehub.org/**

Zalire Yesaya and his wife Susanna Zalira show their groundnuts to Self Help Africa Project Officer

Embedding nutrition within the Farmer Field School approach: Experiences from Malawi

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The authors would like to thank the European Union, which funded the programme and the accompanying research component.

KEY MESSAGES

- The Farmer Field School (FFS) approach strengthens technical capacity at community level and empowers farmers to make decisions on the best crops to grow according to the local context. Nutrition may be included within FFS as a 'special topic'.
- Results from a robust endline evaluation of Self Help Africa (SHA)'s five-year programme in Malawi demonstrated the effectiveness of concerted efforts to improve the overall nutrition sensitivity of the FFS approach. FFS participants were three times more likely to meet their minimum dietary diversity requirement than non-FFS participants (OR = 3.592, $p < 0.001$).
- Nutrition needs to be embedded within the FFS approach, and not just included as a 'special topic'. Activities that were found to be particularly useful were strengthening sector integration, the use of context-specific resources and adaptations, addressing gender norms and embedding market analysis.

A better project

The Better Extension Training Transforming Economic Returns (BETTER) project was implemented by SHA Malawi between 2018 and 2022. Funded by the European Union, BETTER was delivered to 10 districts of Malawi – Chitipa, Karonga, Mzimba, Nkhatabay, Nkhotakota, Salima, Kasungu, Thyolo, Chiradzulu and Mulanje. The programme was implemented by a consortium of four partner organisations: SHA (Lead Agency), Plan International Malawi, Action Aid Malawi and the Evangelical Association of Malawi. The objective of the project was to increase resilience and to improve the food, nutrition and income security of 402,000 smallholder farmers through 13,400 FFSs (Box 1).

The BETTER programme promoted nutrition-sensitive agriculture by integrating nutrition education within all value chain activities in FFS. This approach ensured that participants gained knowledge of how to link the production of more diverse crops, as well as improved harvest and post-harvest practices (including storage), with improved utilisation of crops using locally developed recipes and cooking demonstrations, thereby facilitating the increased consumption of more diverse diets in a sustainable way.

SHA's approach to strengthening nutrition within agriculture programmes

Historically, nutrition has not been embedded within agriculture programming. However, over the past 10 years, evidence has suggested positive benefits of ensuring that the agriculture sector incorporates a nutrition-sensitive approach, including increasing the quantity and diversity of nutritious crops produced, in combination with a strong nutrition behavioural change component to improve dietary diversity (Ruel et al, 2018). Considering this,

SHA aims to include nutrition within agriculture and enterprise programming, where possible. Within the BETTER FFS programme in Malawi, guidelines and standard operating procedures for nutrition-sensitive agriculture were developed. Sensitisation and training was then delivered by the SHA nutritionist to SHA and implementing partner staff, as well as to Ministry of Agriculture colleagues at district and regional level.

As part of the programme, nutrition education focused on promoting crop diversification using a food availability calendar (Box 2), dietary diversity (the promotion of Malawi's six food groups) (Ministry of Health, 2007), improved infant and young child feeding practices, and food budgeting and planning. The promotion of nutrient-dense crops such as groundnuts, beans, soybeans and orange-fleshed sweet potatoes was a core component to increase the availability of more nutritious foods at household and community levels. The programme also provided information on maximising nutrient yields, food processing and cooking demonstrations to ensure better food utilisation (combining foods and food groups). Improved hygiene practices were also promoted, given their documented links with nutritional status (Shrestha et al, 2020), as were strategies for post-harvest management using improved storage.

Research methodology

In Year 4 of the programme, research was conducted by two external consultants with support from SHA Malawi to understand how well the nutrition components were embedded within the FFS approach, how successful uptake of knowledge and behavioural change was and what lessons could be learnt for future programming (Baloyi et al, 2022).

The operational research incorporated mixed methods approaches to collect qualitative and quanti¬tative data. Participatory research approaches were used to understand the overall functionality, effectiveness, efficacy and short-term and long-term nutritional benefits of FFSs, as well as to inform recommendations. Data were collected through household surveys, key informant interviews and gender-disaggregated focus group discussions (FGD).

In total, a regionally representative sample of 225 FFS participants and 76 non-FFS participants were included in this research from three BETTER programme dis¬tricts: Karonga, Thyolo and Salima. FGDs involving FFS participants only took place in Kasungu and Mzimba South due to cost and logistics constraints. A matched case control study design was used, where data were collected, analysed and interpreted for those participating in the FFS (case) compared to data for those not participating in the FFS (control).

Effectiveness of the approach

Nutrition integration within FFSs

- Across the three districts, all nutrition education sessions were facilitated by Master Trainers and Community-Based Facilitators, who are normally more knowledgeable and better versed in agriculture (rather than nutrition) content. There was limited involvement of key nutrition stakeholders, such as health workers and cluster leaders.
- There was variation in the frequency and timing of training on nutrition topics/sessions within FFS. This was largely a result of the different competing interests and expertise of Master Trainers and Community-Based Facilitators, as well as of the lack of a uniform FFS curriculum.
- When considering gender dynamics, there was a divide between women and men's responsibilities and workload, especially in terms of nutrition and preparation of meals. In cases where there were potential economic benefits, for example related to juice making in Salima district, men were more interested in participating in the interventions.

"Sometimes some of the meals for demonstration involves pounding of groundnuts for nsinjiro (seasoning), and this is not what most of us men are used to do."

– FGD, Mkanakhoti, Kasungu District

"We have learnt of food groups and examples of foods that we should be eating to have balanced diets."

– FGD, Mpata Karonga

Impact of the FFS approach on nutrition outcomes

- Compared to non-participation, participation in FFS was associated with high levels of adoption of improved nutrition and water, sanitation and hygiene (WASH) practices at household level. FFS participants were more likely than non-participants to have a backyard garden, to own livestock and to have fruit trees around their homes.
- FFS participants were three times more likely to meet their minimum dietary diversity requirement than non-FFS participants (OR = 3.592, $p < 0.001$).
- There was a significant increase in joint decision-making (by women and men) regarding access to, and control of, backyard gardens, what foods were consumed and how to use the proceeds from the sale of crops/livestock among FFS participants (63.1%) as compared to non-FFS participants (36.9%).

Discussion

Although the linkages between agriculture and nutrition are complex, evidence to date indicates that integrating nutrition education and crop diversification into agriculture programmes can improve dietary diversity and other nutrition outcomes (Pandey et al, 2016). Particularly in rural communities, what is grown determines what is eaten. Thus, building

Box 1 The FFS approach (FAO, 2023)

The FFS approach was developed in Indonesia in the late 1980s by the United Nations Food and Agriculture Organization (FAO), together with national stakeholders, especially the Ministry of Agriculture. FFSs offer an alternative to top-down approaches, which have often proved ineffective. The FFS approach strengthens technical capacity at community level and empowers farmers to make decisions on what crops to grow that are context specific. Crop trials using different agriculture practices and pest management help farmers make decisions on the best crops and varieties to grow, rather than decisions being made at central level.

As part of the FFS approach, groups of 20–25 farmers (ensuring a gender balance) test conventional local practices for growing specific crops compared to national/global standard practices over a planting season, with a strong focus on integrated pest management. Weekly meetings are held to monitor successes and failures. Crops from different trial sites (different types of seed, fertiliser amounts, intercropping, different types of pest management) are viewed and measurements taken to monitor crop growth, disease and (at harvest time) crop yields and produce quality. Records are kept on a weekly basis, and the results inform decisions going forward. Over time the approach has broadened to include a focus on "special topics" such as nutrition, HIV and gender, depending on context and needs. Currently, each FFS meeting includes at least three activities: an agro-ecosystem analysis, a 'special topic' and a group dynamics activity. Under the BETTER programme, although the main focus was on agro-ecological practices with nutrition considered to be a 'special topic', overall efforts were made to increase the nutrition sensitivity more generally across the whole approach.

When establishing FFSs, the FAO is responsible for training Master Trainers and Community-Based Facilitators in the approach. Master Trainers – often government agriculture extension staff – support 30 Community-Based Facilitators, who each form an FFS. The implementing partners at district/community level are responsible for further training and monitoring of FFS activities, including collaboration with district level personnel from different ministries.

Winaka Amina produces eggs commercially on her small farm in Balaka district, Malawi

knowledge on what to grow and how best to harvest, store and utilise foods – and why – should contribute to improved dietary diversity at household level.

Findings from the BETTER programme indicated that FFS participants were three times more likely to achieve minimum dietary diversity than non-participants. One caveat to these promising results is that, as with all findings based on household surveys, they are based on reported rather than observed intakes: FFS participants may be more likely to report what they know they should be eating than non-FFS participants. This being said, FFS participants were more knowledgeable regarding good nutrition and WASH practices, and were more likely to have homestead gardens, fruit trees and own livestock, all of which are factors that can contribute to improved dietary diversity.

Based on our experience and the results from a study conducted in Uganda and Rwanda in 2014 (Nafula-Kuria, 2014), the integration of nutrition within the FFS approach still has limitations and constraints. The following are crucial steps to take towards achieving better outcomes for nutrition within the FFS approach.

Ensure nutrition is a core component of the FFS curriculum

Currently, nutrition is considered a 'special topic' within the FAO FFS training curriculum, but consideration should be given to making it a core component, since sufficient evidence exists regarding the benefits of including nutrition components within agriculture programmes.

Rather than comprising a one-off training session, nutrition should be embedded throughout FFS training. It is also important to highlight how improved agriculture practices, including climate smart agriculture,[1] can positively impact on nutrition. For example, activities such as intercropping with pulses positively impacts on soil fertility and also benefits human nutrition via increased access to pulses for both consumption and income generation.

Strengthen sector integration

For nutrition to become a core component during the training of Master Trainers and Community-Based Facilitators, it may be beneficial to develop training materials within the main curriculum that draw on technical expertise in health, nutrition and WASH from Ministries of Health. Currently, in Malawi, the Ministry of Health does not play and active role in the FFS approach. Increased engagement would support improvements in sector integration.

Including a basic WASH component within nutrition education/promotion facilitated increased adoption of these practices among the FFS participants.

[1] Climate smart agriculture aims to increase agriculture productivity, improve adaptation and resilience to climate change, and mitigate the impacts of climate change through reducing greenhouse gas emissions.

Box 2 Food availability calendar

When completed, the food availability calendar identifies the gaps and times of the year when foods from certain food groups are not available or limited. Discussions can then be had, and decisions made, on how to address these gaps – for example, what foods can be grown to reduce that seasonal gap.

Example of a completed food availability calendar:

Example of Food Availability Calendar by Food Group and Malawi Seasons

Food Groups	Available Foods :	October	November	December	January	February	March	April	May	June	July	August	September
1. Staples	Green Banana			✓	✓	✓	✓	✓	✓	✓	✓		
	Maize						✓	✓	✓	✓	✓		
	Sorghum						✓	✓	✓	✓	✓		
	Cassava	✓	✓					✓	✓	✓	✓	✓	✓
	Yams	✓	✓									✓	✓
2. Fruits	Mangoes			✓	✓	✓	✓						
	Pawpaws							✓	✓	✓	✓		
	Bananas							✓	✓	✓	✓		
	Pineapples	✓	✓										✓
	Tangerines								✓	✓	✓		
3. Vegetables	Amaranthus		✓	✓	✓	✓							
	Sweet potato leaves					✓	✓	✓	✓	✓	✓		
	Rape	✓	✓					✓	✓	✓	✓	✓	✓
	Tomato						✓	✓	✓	✓	✓	✓	✓
	Pumpkin leaves				✓	✓	✓	✓	✓				
4. Legumes & Nuts	Beans						✓	✓	✓				
	Cowpeas						✓	✓	✓	✓	✓		
	Pigeon peas							✓	✓	✓	✓	✓	✓
	Groundnuts							✓	✓	✓	✓	✓	
	Soya beans						✓	✓	✓	✓			
5. Animal Foods	Flying ants		✓	✓	✓	✓	✓						
	Eggs (chicken, ducks etc)	✓	✓	✓	✓	✓	✓					✓	✓
	Milk					✓	✓	✓	✓	✓			
	Meat (rabbits)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Crabs			✓	✓	✓	✓						
	Small fish	✓	✓									✓	✓
6. Fats and Oils	Avocado			✓	✓	✓	✓						
	Coconut							✓	✓	✓	✓		
	Sunflower seeds							✓	✓	✓	✓		
	Pumpkin seeds							✓	✓	✓	✓		
	Sesame seeds							✓	✓	✓	✓		

Key:
✓=Available Foods

Use context-specific/locally developed resources to greater effect

The Ministry of Agriculture, Irrigation and Water Development, together with the FAO and funded by the Government of Flanders, produced a Nutrition Handbook for FFS in 2015 (Ministry of Agriculture, Irrigation and Water Development, 2015). While this resource was revised during the programme implementing period, it was not shared with Master Trainers and SHA staff. This would have been a valuable resource for the Master Trainers and Community-Based Facilitators and should potentially have been translated into the major Malawian language (Chichewa). This is an example of a case where a resource is developed but not used for various reasons, including lack of awareness of the resource, perceived need to produce tailored material for individual programmes and the unavailability of material in local dialects.

Basic training materials, such as the seasonal food availability calendar, the malnutrition problem tree and the Malawi food group chart, were translated into local dialects and made available to members at FFS level. This was important for accurate sharing of basic nutrition information and for participants to be able to refer to the material when necessary. Cooking demonstrations also supported knowledge retention through practical hands-on learning, with community participatory engagement.

Context-specific adaptations can optimise results

Within the FFS approach, the farmers decide which crops to focus on during trials. However, under the Malawi FFS programme, a majority of the farmer groups focused on maize (the main staple). To ensure farmers considered other crops and therefore produced a more diversified harvest, it was decided that farmers would also have to trial a less common crop within the FFS. The programme was successfully adapted to reflect this by conducting trials on crops such as sorghum, cassava and cowpeas, and also by trialling drought-tolerant varieties as part of the intervention.

The Fall Armyworm – an invasive species with broad geographical coverage and a propensity for crop destruction – became a major pest during the programme. To address this, trials were conducted in different parts of Malawi using four different options: synthetic pesticides, hand picking and two types of botanical pesticides - fish soup and chilli and tobacco pellets crushed and made into a spray with detergent. The latter was identified as the most successful approach in terms of availability, affordability and results. This shows how flexible the FFS approach can be to changes in local context.

Embed a stronger market analysis

Moving forward, it is valuable to embed a stronger market element at the start of an FFS programme. Ideally, market surveys should be conducted to understand the baseline situation, and a plan should be developed for strengthening the various elements of the value chain so that increased production can increase access to markets and income, and ultimately consumption within the household.

Members of Chimankhuku Women's Poultry Club, selling chickens at their local market, Malawi

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Gender dynamics

Gender was a cross-cutting issue within the BETTER FFS programme. Considerably higher levels of joint decision-making were reported in FFS households as compared to non-FFS households in two of the three districts surveyed – Thyolo (62% and 38% respectively) and Salima (57% and 43% respectively). In the third district (Karonga), there was no difference in level of joint decision-making.

Interestingly, in this district, a particular cultural tenet holds that most decisions should be made by males/husbands. This suggests more focused, context-specific efforts are needed to improve gender dynamics where gender norms are more strongly entrenched. Improving women's empowerment in agriculture is an important pathway through which nutrition outcomes can be improved.

Conclusion

Overall, strengthening the nutrition component of the FFS (including WASH) showed great promise in contributing to improved food and nutrition security at community level, particularly in rural agriculture communities where chronic malnutrition remains a challenge. Increasing the production of more diverse crops and improving harvest and post-harvest handling, including storage and better combination and utilisation of foods, is a 'win' for all. It is important to continue embedding nutrition components within agriculture interventions to support poor rural communities in better understanding how changes to agriculture production can improve access to diverse nutritious diets and generate incomes from excess resources/harvests. Ensuring that nutrition is better integrated as a core component of the FFS approach is a priority.

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In Chigwirigwidi, Burundi, farmers have been building stone bunds to control water run-off from the hill

Research gaps and priorities in nutrition in emergencies

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This views piece summarises work on the recently published light-touch research mapping exercise conducted within the Global Nutrition Cluster (GNC) Technical Alliance ('the Alliance'). The report is available at: https://www.ennonline.net attachments/4755/FINAL_ Mapping-research-prioritise-for-nutrition-in-emergencies.pdf

Background

The Global Humanitarian Overview estimated that 223 million people would require humanitarian assistance in 2023 – the highest figure in decades. With such a high burden and scarce resources, it is essential that programming for nutrition in emergencies can demonstrate cost-effectiveness and enable a better, more evidence-based response that maximises impact for affected populations. Over the past decade, there has been a sizeable increase in research investigating the effectiveness of nutrition in emergencies programming. However, considerable knowledge gaps remain. Conducting research on nutrition in emergencies is challenging due to logistical obstacles, ethical barriers and a lack of funding. Furthermore, where research has been conducted, there are often challenges around adequate data quality, which impacts overall research findings and subsequent programmatic recommendations.

A light-touch mapping of research gaps and priorities in nutrition in emergencies

The Alliance is a global mechanism that aims to provide predictable, timely and coordinated nutrition technical assistance to meet the nutrition needs of people affected by, and at risk from, emergencies. The 2021 GNC annual meeting highlighted that the lack of nutrition research is impeding practitioner-level understanding of appropriate evidence-based responses for different and changing contexts – responses that could improve the effectiveness of programming for nutrition in emergencies. To begin to fill this void, a research mapping exercise was conducted (August 2022–January 2023) to highlight the key research gaps in each of the Global Thematic Working Groups (GTWGs):[2] Infant and Young Child Feeding in Emergencies (IYCF-E); Nutrition Information Systems (NIS); management of small and nutritionally at-risk infants under six months of age and their mothers (MAMI); and Cash and Voucher Assistance (CVA) for nutrition outcomes. The mapping was not intended to be a systematic or comprehensive review of all literature, but rather a light-touch exercise that drew from a broad range of existing work and the knowledge of the GTWGs (Box 1).

Key findings

IYCF-E

Since January 2022, 37 peer-reviewed papers have been published that relate to IYCF-E. However, only seven of these studies have contributed to answering the research priorities previously identified in 2016. Research on the effectiveness and cost-effectiveness of complementary feeding interventions and safe mechanisms for supplying and managing breast milk substitutes in emergencies were also identified as top research priorities.

MAMI

Comparing available research and the previously highlighted research gaps, many practical and foundational MAMI-related research questions appear to remain unadressed. The lack of a validated anthropometric screening method was noted as a key barrier to programming, as well as the need for more research on how to effectively support at-risk mother–infant pairs once identified. Large research gaps were also noted in relation to the feasibility and cost-effectiveness of breastfeeding support packages for wasted infants.

NIS

There appears to have been a limited amount of research on NIS in emergencies, with more focus on developing specific initiatives, tools and platforms. More operational research may be beneficial to enable further guidance to be developed. Based on the prioritisation survey, GTWG members highlighted gaps in obtaining accurate nutrition information where standard data collection mechanisms are not possible, the design of 'good enough' data collection systems, and the need to move away from dependence on repeated one-off surveys for NIS decision-making.

CVA for nutrition outcomes

Despite the increasing utilisation of CVA as a modality for humanitarian assistance, there has been limited investment in evidence generation from programmes using CVA for nutrition in emergencies. The prioritisation survey identified research questions that focus on understanding context-specific impact pathways between CVA and nutrition outcomes to enable better informed programme designs. Several priority questions also related to the practical questions around CVA modalities and overall programme design for nutrition outcomes and cost-effectiveness.

Wasting

Identified research questions fell into four main categories: impact and effectiveness of interventions for the treatment and prevention of wasting; improving detection and targeting for the prevention and treatment of wasting; the causal pathway for wasting; and integration of treatment and prevention of wasting into health systems. In the ongoing WHO guidelines update process, a number of research gaps were identified in the ongoing WHO guidelines update process. Building on the research gaps identified in the guideline development process and existing research prioritisation exercises, the UNICEF-WHO Technical Advisory Group on wasting aims[4] to identify

[1] To find out more about the Alliance, visit https://ta.nutritioncluster.net/

[2] The GTWGs are groups of technical experts in a thematic area that provide a platform for developing timely, consensus-driven, stop-gap guidance in response to key technical gaps identified by the Alliance.

and prioritise formative and operational research and knowledge gaps on wasting prevention and treatment.

Moving forward research on nutrition in emergencies

Research on nutrition in emergencies is essential to continue building evidence regarding what works, to maximise impact and to ensure the effective and efficient use of resources. However, many challenges remain in conducting research in emergencies and in ensuring high-quality data, including high levels of insecurity, mobile populations, and the lack of infrastructure and resources to implement comprehensive study designs. It is often not possible to create a control group in such a setting, and as a result most research is observational. Research also often requires additional coordination and stakeholder engagement that actors may not have the capacity for in emergency contexts. However, opportunities remain to embed operational research and more robust monitoring, process and outcome measures into ongoing programming.

A key finding from the light-touch research mapping activity is that conducted research often tends not to answer the identified research priorities. For example, only 19% of peer-reviewed studies conducted on IYCF-E in 2022 contributed to answering previously identified research priorities. This may reflect the need for further advocacy and dissemination of identified research priorities, and/or for revisiting or broadening these priorities.

Additionally, engaging those involved in guidance development during research design is critical to ensure research is ultimately used to shift guidance and policy. Within guidance development, the fundamental question of what research and evidence is 'good enough' to shift implementation requires examination, particularly given the current relatively strict inclusion criteria that are often needed by systematic reviews such as Cochrane and the subsequent updates to health and nutrition programme guidelines led by WHO. Emergency responses are often informed by needs and available resources rather than by optimal research, as seen in the implementation of some simplified approaches to wasting treatment despite the fact the evidence base remains fairly limited.

At the same time, given the challenges in conducting research in emergencies, it is essential to identify which questions cannot be answered in more stable settings and what study designs are best suited to answer these specific questions. For many of the thematic areas, practical questions remain around intervention design, cost-effectiveness and feasibility, and these might be better answered through operational research and feasibility studies than through randomised controlled trials.

The light-touch research mapping exercise identified a sparsity of evidence for MAMI, NIS and CVA for nutrition outcomes in emergency contexts. Wasting remains one of the most prominent topics for nutrition in emergencies research, with the focus on identifying wasting as a possible barrier to research in other thematic areas, as well as an opportunity to explore synergies and leverage ongoing initiatives.

Given the scale of continued nutritional needs, a continued focus on research in emergency contexts is vital. Research funding that is flexible to the rapid and changing nature of emergencies needs to be made more readily available. Further funding is needed to strengthen the quality of nutrition in emergencies research alongside working to ensure that research answers priority questions and can be effective in influencing programming and guidance.

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A women's cooperative uses solar energy to operate the borehole that supplies water to the market garden on the banks of the Senegal River in Mauritania

Box 1 Methodology

- ***IYCF-E:*** We mapped published peer-reviewed research captured in the IYCF-E research repository (as of 1 January 2023)[3] against a previously published research prioritisation exercise from 2016 (Prudhon et al, 2016), as well as against a 2021 research stock-take (not yet publicly available), and explored with Infant Feeding in Emergencies Core Group members what they felt were the current key research priorities.
- ***MAMI:*** We conducted a small-scale, non-systematic review of published peer-reviewed and grey literature to identify research conducted following a published research prioritisation exercise conducted in 2015 (Angood et al, 2015).
- ***NIS and CVA for nutrition outcomes:*** We identified research gaps for both thematic areas through a small-scale, non-systematic review of published peer-reviewed and grey literature, building off work already done by the groups. Utilising an online survey, members of each GTWG were then asked to prioritise these identified research gaps and list any that had been missed.
- ***Wasting:*** There have been several recent research prioritisation exercises on the prevention and treatment of wasting and ongoing efforts by World Health Organization (WHO) and UNICEF to update and move forward the wasting research agenda. Given this, we summarised previously identified research gaps and articulated any published work that has begun to address these gaps.

[3] The repository is compiled for the IFE Core Group by the Johns Hopkins Center for Humanitarian Health at Johns Hopkins Bloomberg School of Public Health, the Friedman School of Nutrition Science and Policy at Tufts University and the Gillings School of Global Public Health at the University of North Carolina at Chapel Hill. The repository aims to provide the reader with a snapshot of what is published, and is updated on a quarterly basis: https://www.ennonline.net/ife/iycferepository

[4] The UNICEF-WHO Technical Advisory Group on wasting is a multidisciplinary group of healthcare workers, policy-makers, programmers and researchers established in 2022 to conduct various tasks, including coordinating the wasting-related research agenda.

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Are calls to action global health nonsense?

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ENN's mission for 2023 should be nonsense-busting – thus began our internal email thread as we shared Stein and colleagues' recent feature in The British Medical Journal (2022). Their declaration that "Global health nonsense must be called out, because it stifles collective efforts to understand, critically assess, and improve global health governance" both resonated with us and challenged us to look inwardly. Stein and colleagues state that meaningless buzzwords and technocratic jargon have proliferated, "leading to obfuscation, misrepresentation and omission of relevant information". They note that we are all complicit in using terms that tend to be pointless or unnecessary. There are terms that reinforce existing power hierarchies, terms that muddle reality and terms that leave you wondering what is actually being said – see Figure 1 for some of our favourites. They suggest that, by using them, we disguise reality and prevent informed action for global health equity.

In the same issue of the journal, a wry editorial by Ryan Essex (2022) about potential 'slacktivism'[1] in a call to action made us reflect on whether, at ENN, we are contributing to improving global health governance or creating more global health nonsense.

We thought of our recent role in facilitating the development of the Wasting Reset: A Call to Action (2021), where ENN facilitated 50 governments and organisations to come together to discuss and reach consensus on the actions required to accelerate progress in six areas related to the prevention, early detection and treatment of wasting (advocacy; financing; prevention; treatment scale-up; nutrition products for tackling wasting; and policies and guidelines) in order to achieve global targets. The process aimed to align with, and build upon, the priorities identified through existing global initiatives such as the Global Action Plan for Child Wasting.[2] Eleven recommendations were prioritised and formed the basis of a high-level round table consisting of several ministers/representatives from low- and middle-income countries, United Nations directors and donors tasked with turning these agreed recommendations into successful actions and commitments. A consolidated Call to Action was developed[3] as a result, which was launched at Nutrition for Growth in 2021.

Achieving a succinct list of actions as agreed priorities for achieving progress – and bringing these to the agenda at global level – seemed like an achievement, especially considering how many actors are involved in different elements of wasting treatment and prevention. However, the question we (and surely all those who were involved) have been asking ourselves is: "What next?" Behind the Call to Action itself were more detailed action plans, which were collectively developed for each of the six areas with an attempt to identify who was responsible for action in each area. Who is implementing these plans?

These questions sit rather uncomfortably with Essex's assertion that a call to action "has several obvious advantages over actually acting. Making that call allows you to salve your conscience, to 'do something' without the hard work of actually doing something". By facilitating this Call to Action, have we at ENN been complicit in Stein and colleagues' claim that technocratic global health nonsense prevents informed action?

From our experience with the Wasting Reset process, we have seen the value of coming together so that diverse actors, voices and perspectives can be heard or discussed. We feel that there are some positive aspects of a call to action, and that these are as much about the process as they are about the actual output. Collaboration fosters compromise, and compromise was indeed needed when working groups were required to strictly prioritise actions in their areas of focus. An inclusive process, if it can be facilitated to reach consensus on the required actions, can prevent different agendas and messages competing on the global stage: they can be a tool to lift an issue up the global health agenda and give it a profile it did not have before. If there is a need to find harmony in diverse perspectives to rally around a common cause, we feel a call to action is not just "global health nonsense" and that it has an intrinsic value in itself.

As Essex states, "What is unknown of course, is what follows the call to action." It is hard for us to say whether the Wasting Reset did raise the profile of the issue on the global agenda. Did we actually achieve anything? There remains no agreed ownership over the detailed action plans, although various actors and initiatives were undoubtedly already working on components before the Call to Action was issued and are continuing to make progress. Although our intention was to accelerate that progress through the Call to Action, it paid no attention to how these plans would be taken further. Little more than a year after the Wasting Reset Call to Action was made, there has been a perceived need by UN agencies to release another call to action on the same topic, which does seem to call its utility into question. Interestingly, an operational non-governmental organisation got in touch with us very recently saying they had just come across the Wasting Reset Call to Action, that they felt it aligned well with their agenda and that they wanted to know the next steps to put those agreed actions into practice – a reminder to us and, we hope, to all those involved that a call to action needs to be followed by action. As Ryan Essex states: "Calls to action are arguably most problematic when they divert well-meaning people away from acting, and care should be taken to mitigate this risk." Would the ultimate nonsense-busting be to make our Call to Action redundant by the success of our collective action? We think so.

Figure 1 Jargon that drives some of us mad at ENN

Nexus	This feels like a very complicated way of saying something simple. And where is the limit? We went from 'nexus' to 'triple nexus' to 'quadruple nexus'…
Transformation	A word that can probably only be used retrospectively and with evidence to back it up. Highly aspirational – and what is actually supposed to happen?
Nutrition-sensitive	A term that makes no sense to anyone in the non-nutrition space. Sensitive to whom or what? And why do we need to subdivide efforts to create a healthier and better-nourished world?
Shift the narrative	Pretty intangible. Don't we all have our own story to tell? It implies that we should value varying viewpoints differently, rather than embracing all different perspectives and focusing on finding common ground.
Call to action	This requires that time and effort is spent on talking instead of doing often vague, based on values of how things should be, without detailing how we can do better.
Localisation	This implies that a superior, global power will make something happen 'locally' it is a top-down approach, often with limited meaning and action, that continues the 'we' and 'them' divide.
Scale up	Often used flippantly, presented as something that will just happen and is simple, without considering what is involved. Also usually seen as a scale-up in numbers, promoting the idea that more is better.
Maximising accountability	This implies that sometimes you do not actually have to take full responsibility – that there are gradations of accountability that can be turned up and down like a dial.
Increase the efficiency	The definition of 'efficiency' is "achieving maximum productivity with minimum wasted effort or expense" (Oxford Languages). How can you increase that?

[1] 'Slacktivism' is defined as an activity that uses the internet to support political or social causes in a way that does not need much effort, for example creating or signing online petitions (Cambridge Dictionary).
[2] https://www.childwasting.org/
[3] https://www.ennonline.net/wasting-reset-call-to-action

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A dad provides Kangaroo Care to his child in a Neo Natal Intensive Care Unit in Chennai, India

Adapting the MAMI Care Pathway Package in India:

Progress and direction

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KEY MESSAGES

- A series of consultations in India between 2018 and 2021 has guided the adaptation of the MAMI Care Pathway Package (an integrated care model) to the Indian context, to strengthen policy provision and frontline care of infants under the age of six months with early growth failure.
- Adaptation has involved integrating key components within existing community and facility-based programmes.
- Further steps identified in a 2021 consultation on pilots in Maharashtra, Bihar and West Bengal include to increase coverage and utilisation of existing health and nutrition services; to strengthen community-level support during the first six months of life; to improve the counselling skills of frontline workers; to strengthen growth promotion activities; and to build the capacity of nutrition rehabilitation centres (NRCs).

Introduction

Small and nutritionally at-risk infants under the age of six months includes infants who are born too small or who become so in early life. In India, this is considered early growth failure (Box 1). Infants may be low birth weight (including premature), wasted, underweight and/or have growth or feeding difficulties. Infants may also be clinically unwell. In India, 27% of infants under the age of six months are wasted/acutely malnourished (weight-for-length (WLZ) <-2 and 13% severely wasted (WLZ <-3)), while 32% are underweight (weight-for-age (WAZ) <-2) and 10.6% are severely underweight (WAZ <-3) (Government of India, 2021). The prevalence of babies born with a low birth weight is very high (18%), and many of them are or become wasted. Only 41.8% of children are breastfed within the first hour of birth and only 63.7% of infants under the age of six months are exclusively breastfed (Randev, 2020).

A variety of programmes and platforms exist in India to identify and manage early growth failure (Kumar et al, 2020a) (Figure 1). However, the uptake of services tends to fall short of expectations. For example, only 58.1% of pregnant women have at least four antenatal check-ups and only 40% of children receive their health check-ups under the national Integrated Child Development Services (ICDS) programme (Government of India, 2021). Although India has done remarkably well in increasing the survival of high-risk newborns and infants by identifying and managing sickness within dedicated facilities and targeted programmes (Kumar et al, 2020b), community-based interventions that address infant and mother health and nutrition need further strengthening. Services for pregnant women centre on physical illness, with little support for maternal mental health (for example). Regional variations, poor service integration and gaps in referral systems further hinder the continuity of quality care. Practical constraints include poor availability of appropriate equipment (digital weighing scales and infantometers) and differing skill levels of community health workers. Furthermore, there remains a paucity of evidence and a lack of initiatives in India on how best to address the prevention, identification and management of acute malnutrition in children under six months of age (Chowdhury et al, 2021).

Box 1 Criteria for early growth failure in infants under the age of six months

Any of the following criteria:
- Low birth weight
- Not regaining birth weight by day 14 of life
- Poor weight gain (<150g/week) after the second week of life
- Static weight or weight loss on two consecutive visits
- WAZ less than -2SD
- WLZ less than -2SD

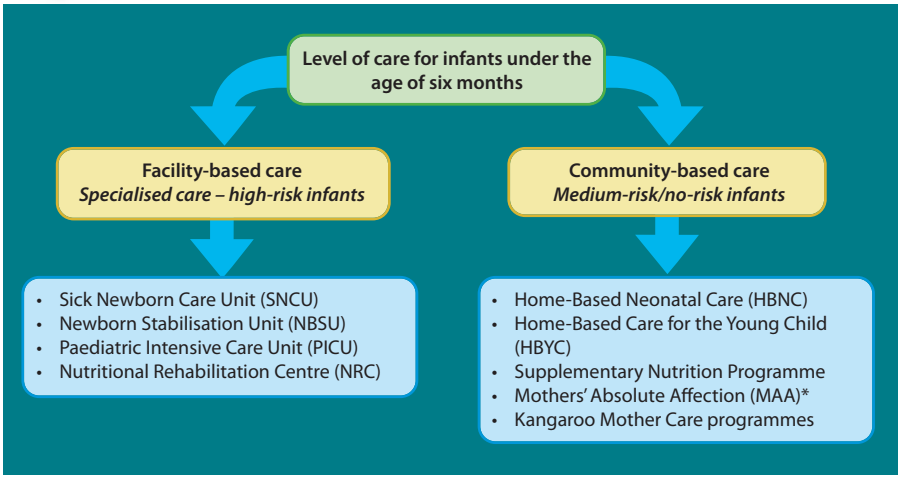
The MAMI Care Pathway Package, co-created by members of the MAMI Global Network,[1] is a set of resources and materials to help practitioners identify, assess and manage small and nutritionally at-risk infants under six months of age and their mothers. It applies an integrated care pathway approach, modelled and building on integrated management of childhood illness and linking maternal and infant health and nutrition services, and requires contextualisation. While there are limitations, existing platforms in India offer rich potential for integrated management of early growth failure in India. This article shares experiences to maximise on these within existing services based on the adaptation of the MAMI Care Pathway Package to the Indian context.

Policy development

To facilitate adaptation of the MAMI Care Pathway to the Indian context, policy makers, national and international experts, academia, and technical and development organisations were convened as part of three expert consultations[2] guided by an expert panel.[3] These consultations, which took place between 2018 and 2021, aimed to facilitate experience exchange and learning, to develop consensus and to identify next steps on how to leverage and maximise existing services for early growth failure management (Figure 2).

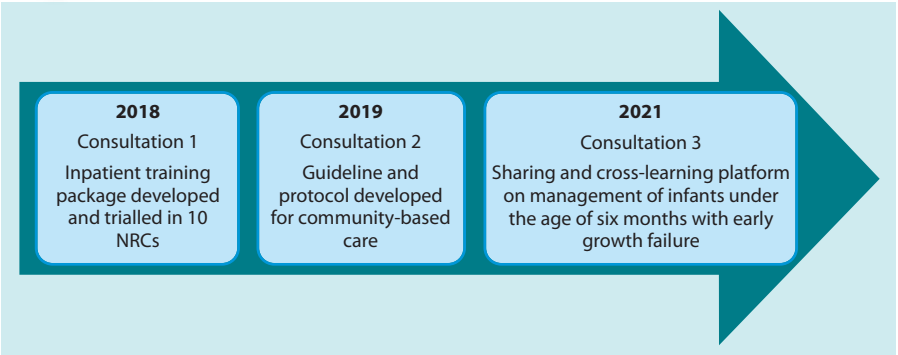
An inpatient care training package was developed following the 2018 consultation and piloted in 10 NRCs (Kumar et al, 2020a). As a result of the 2019 consultation, the National Centre of Excellence for Management of Severe Acute Malnutrition (NCoE-SAM) at Kalawati Saran Children's Hospital led the development of a national guideline and protocol for the community-based management of early growth failure in infants under the age of six months, based on the MAMI Care Pathway Package. The MAMI Care Pathway Package was contextualised by integrating its different components into existing community-based programmes managed by the government-appointed community health workers (Figure 3). This national guideline was the reference for developing operational guidelines piloted in three states. A third national consultation was held in 2021 to discuss key developments and experiences to date and are summarised here.

Figure 1 Delivery platforms for care for infants under the age of six months with growth failure in India



* MAA is a nationwide programme of the Ministry of Health and Family Welfare, Government of India, in an attempt to bring undiluted focus to the promotion of breastfeeding and to the provision of counselling services for supporting breastfeeding through health systems.

Figure 2 Timeline for the adaptation of the MAMI Care Pathway Package in India



National consultation 2021

The 2021 consultation focused on the burden of wasting and associated risk factors in infants under the age of six months. Experiences of adapting the MAMI Care Pathway Package to the Indian context from the states of Maharashtra, Bihar and West Bengal were shared. Key considerations that emerged for both facility-based and community-based management of infants under the age of six months with growth failure were discussed[4] as follows.

Criteria for identification

The World Health Organization (WHO) (2013) recommends a WLZ z-score of <-3 or the presence of bilateral pitting oedema to identify severe wasting in infants under the age of six months. However, WAZ is increasingly being recognised as the best predictor of mortality among infants under the age of six months and is gaining more traction (Chowdhury et al, 2021). Monthly growth monitoring of children in India uses WAZ growth charts under the ICDS programme (Ramachandran & Gopalan, 2011) and could be further expanded as a way of identifying at-risk infants under the age of six months. Measuring the length of infants under the age of six months can be cumbersome, especially outside facilities, and length boards are not consistently available. While there is emerging evidence on the use of mid-upper arm circumference (MUAC) in this age group, more research is needed in the India context.

Using F-75 versus diluted F-100 for therapeutic purposes

Infants without prospects of breastfeeding are currently managed with F-75 or diluted F-100 in inpatient facilities. Experiences from Maharashtra using F-75 demonstrated good weight gain in infants admitted to tertiary care facilities. The use of F-75 has a practical advantage, as it avoids potential errors in preparing diluted feeds from F-100.

Growth charts used for identification of risk in low birth weight infants

Intergrowth 21[5] postnatal growth charts take account of gestational age and prematurity and therefore enable more accurate identification of growth faltering in low birth weight infants.

[1] https://www.ennonline.net/ourwork/research/mami
[2] National Consultation of Addressing Acute Malnutrition: http://coesamnetwork.org/Reports.aspx?flag=4
[3] The expert panel comprised Dr Satinder Aneja, Professor and Head, Department of Pediatrics, Sharda University; Dr Ashok Kumar Rawat, Chairperson of the Pediatric and Adolescent Nutrition Society and Senior Technical Advisor, NCoE-SAM, KSCH, New Delhi; Dr Ritu Rana, Assistant Professor, IIPHG, Gujarat; and Marie McGrath, Technical Director, Emergency Nutrition Network, MAMI Global Network Co-chair, United Kingdom.
[4] Inpatient care was also discussed, but is not elaborated on in this article.
[5] https://intergrowth21.tghn.org/standards-tools/
[6] https://www.who.int/tools/child-growth-standards/standards

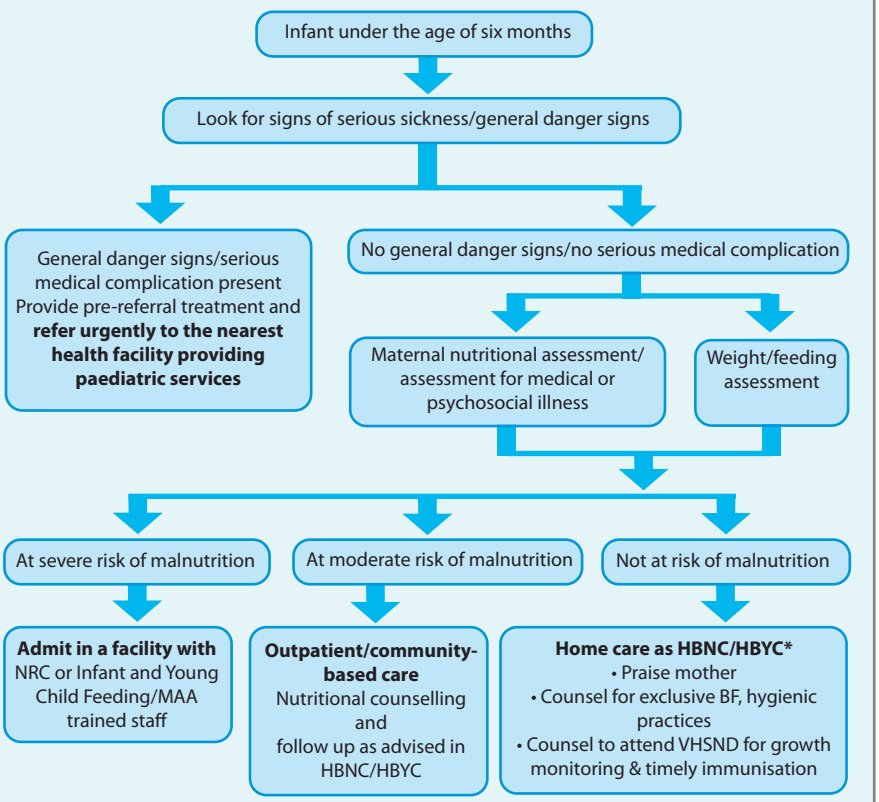
WHO standard growth charts[6] and Fenton growth charts (Fenton & Kim, 2013) do not account for prematurity or gestational age and may therefore overestimate the prevalence of growth problems in these infants. In India, more evidence is needed on the most appropriate and feasible growth chart for the identification of nutritional risk among low birth weight infants, noting that accurate gestational age is often not available.

Opportunities for further adaptations to existing services

The presentations from Maharashtra, Bihar and West Bengal raised the potential benefit of upgrading the community-based individual cards – prompt cards for health professionals to use during consultations – to include additional content. Potential additions include:

- Maternal anthropometry (weight and MUAC) during home visits
- Feeding assessments
- Breast examination of mothers to assess sore/engorged nipples or suspected mastitis
- Observation of breastfeeding with respect to positioning, attachment and effective suckling
- Maternal mental health assessment
- Inclusion of the Integrated Management of Neonatal and Childhood Illness 0–2 months protocol
- Kangaroo Mother Care
- Documenting if the infant is referred to another service and the reason for referral

Figure 3 Algorithm of an adapted MAMI Care Pathway in India



* Home-based newborn care (HBNC); home-based care for the young child (HBYC); village health, sanitation and nutrition days (VHSND)

Importance of sensory stimulation and play therapy

The panellists discussed how sensory stimulation and play therapy should be a part of the routine management of at-risk infants under the age of six months, as they have led to improvements in various domains of development including motor, language, cognitive, social-emotional and self-help development – as highlighted in Field Exchange issue 68 (Kamble et al, 2022).

The presentations and panel discussion from the third consultation concluded with some consensus on guiding principles and next steps that have the potential to strengthen the care of infants under the age of six months with early growth failure.

Increase coverage and utilisation of services

Leveraging existing health and nutrition services for infants and children and for pregnant and lactating women is integral to increasing coverage and service utilisation. Efforts should be made to enhance convergence between different government departments to establish linkages between existing services for infants and children and services for pregnant and lactating women. This will enable a continuum of care so that mothers and infants receive the entire package of services from pregnancy through six months of age, rather than fragmented service provision. The framework and guidance from the MAMI Care Pathway Package can help identify useful linkages across facility-based and community-based service providers. Further, a more targeted approach to reach the most vulnerable and underserved populations, especially those residing in hard-to-reach areas or in predominantly tribal areas, would be valuable.

Strengthen support in the first six months of life

A high-quality, comprehensive, community-based package of care for at-risk infants in the first six months of life and their mothers is needed in India. This needs to include lactation support, improved growth monitoring coverage, nutritional classification (severe/moderate/not at risk), medical assessment, appropriate action and referral services.

Enhance the counselling skills of frontline workers

There is an urgent need to enhance the counselling skills of frontline workers, especially on skilled lactational management and in the provision of psychological support to mothers. Counselling sessions should be conducted using appropriate counselling aids and job aids (although these exist, translation into local languages is needed). Knowledge and skills of community health workers can be improved through continuous training and supervision. Counselling materials should be made available to all community health workers.

Develop growth monitoring and promotion (GMP) activities

There is potential to further develop GMP activities. Currently, GMP is institutionalised through ICDS and mostly conducted as a standalone activity. GMP activities can be strengthened and connected to other services by ensuring the availability of functional equipment at all health points; by improving the knowledge and skills of community health workers to take correct anthropometric measurements and correctly classify nutritional status; by ensuring the use of 'Mother and Child Protection' cards for growth monitoring by community health workers; by enhancing the involvement of community members in GMP activities; by conducting children's medical assessments; and by creating linkages with referral services based on their nutritional and medical assessments. In many places, 'Accredited Social Health Activist' kits[7] are often unavailable. Strengthened supply chain mechanisms for timely supply of commodities and equipment and improved data quality and data completion are also critical for quality care.

Build capacity of NRCs

Lastly, there is a need to build the capacity of NRCs to manage high-risk infants under the age of six months with early growth failure, especially if they have co-morbidities. Resident doctors and other medical staff should be sensitised on the management of these cases and

[7] Under the National Health Mission, each Accredited Social Health Activist is provided with two kits: 1) a drug kit, which mainly contains drugs for minor ailments, and 2) an equipment kit, which contains a weighing scale, digital watch, thermometer, communication materials, etc.

on how such case management differs from that of older children.

Conclusion

In India, early growth failure in its various forms is most prevalent among infants under six months of age and is associated with higher risks of morbidity and mortality. Early identification and intervention is therefore critical. Most cases can be treated at outpatient/community level. Experiences from three states in India reflect both progress and the potential to apply the MAMI Care Pathway approach to the Indian context by strengthening and connecting existing community and facility-based programmes, as well as by implementing the recommendations made during the consultation. India is on a pathway towards a scalable approach to continuity of care.

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Merankebandi participant and her children. Burundi, 2021

Field Article

National social assistance programmes to improve child nutrition:

Lessons from Burundi, Ethiopia and Tanzania

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KEY MESSAGES

- Significant progress is being made by governments in Eastern and Southern Africa (ESA) to implement large-scale social assistance programmes that target financial assistance to the most vulnerable members of society.
- Examples from Burundi, Ethiopia and Tanzania show that combining cash transfers with 'plus' elements – such as social and behaviour change (SBC), livelihoods support and links to services – can help address the underlying determinants of child undernutrition, leading to nutrition impact.
- National social assistance programmes can go further in preventing undernutrition by including scale-up mechanisms in response to shocks, and by linking with food systems interventions to improve access to nutrient-dense foods at all times.

Background

National social protection systems are rapidly evolving in ESA to address poverty and vulnerability among the most fragile populations. Evidence suggests that social assistance, usually in the form of large-scale cash or food transfers and public works programmes, can reduce levels of extreme poverty and improve household food security and diet diversity (Owusu-Addo, 2018). A recent systematic review and meta-analysis has shown that cash transfer programmes have significant, but heterogeneous and modest, positive impacts on child stunting, child wasting, consumption of animal source foods, diet diversity and incidence of diarrhoea (Manley et al, 2022). Nutrition impacts may be enhanced when cash transfers are delivered alongside complementary interventions, or 'plus' elements, such as SBC, livelihoods support and links to primary healthcare and other services (Manley et al, 2022; Little et al, 2021).

UNICEF is supporting national governments in ESA to design and pilot 'cash plus' programmes that target nutritionally vulnerable households with cash and additional services to help prevent maternal and child undernutrition. These programmes aim to address multiple underlying causes of undernutrition by increasing household resources, as well as access to nutritious *foods*, uptake of positive nutrition *practices* and access to nutrition and other *services*. This is a key contribution to UNICEF's Global Nutrition Strategy 2020–2030 (UNICEF, 2020), which positions the social protection system as one of five key systems to prevent all forms of malnutrition by 2025. The following article builds on the experiences of combining cash transfers with nutrition counselling in Kenya that were shared in Issue 68 of Field Exchange (Angood et al, 2022)[1], and illustrates further examples of 'cash plus' programming in Burundi, Ethiopia and Tanzania. The examples and lessons learnt are drawn from country case studies documented by UNICEF ESARO and the UNICEF Global Technical Team on Social Protection and Nutrition, in collaboration with UNICEF country teams. The full set of case studies is available at the following **link**.

Examples of national 'cash plus' interventions

The Merankabandi programme in Burundi

The Merankabandi model provides cash transfers to chronically poor households alongside community-based nutrition SBC and livelihoods support.

Merankabandi is the Government of Burundi's national social safety net programme. It began as a pilot scheme (2018–2022) funded by the World Bank, implemented with technical support from UNICEF and partners. The pilot targeted 56,090 extremely poor and vulnerable households in four provinces (Gitega, Karuzi, Kirundo and Ruyigi) with cash transfers and additional support to build resilience to shocks and prevent undernutrition. Eligible households were those with children aged under 12 years, to reach younger children at high risk of stunting and support older children's attendance at primary school.

The cash component involved unconditional electronic payments of USD24 to households every two months for 30 months, equating to 60% of *per capita* income for the average household. The 'plus' component involved delivery of community-based SBC to caregivers to support uptake of optimal care and nutrition practices. Tented group spaces called 'Hinduringendo' ('let's change our behaviour') were established in each village (215 in total) with a meeting space, handwashing device, kitchen garden, cooking area, playground for children and latrine. Community Agents used these spaces to demonstrate cooking, kitchen gardening and hygiene practices and provide group awareness-raising sessions focused on relevant, actionable skills using locally available resources and foods.

Partway through the pilot, additional funding was received to set up 'solidarity groups' in target areas as an exit strategy for Merankabandi members. Members of solidarity groups met weekly to receive financial education and contribute savings from which income generation activities and unexpected costs could be supported. Ongoing support for kitchen gardens was also given and SBC messages were reinforced. A key implementation challenge was weak integration between different programme components, with the cash, SBC and solidarity group elements often neither being delivered to the same households, nor at the same time. The Community Agent model was also expensive and time-consuming, given the need for recruitment and training.

Results of real-time monitoring have shown positive changes in intervention households along the nutrition impact pathway, including improved access to healthcare, exclusive breastfeeding rates, availability of food for children, handwashing with soap and sanitation, as well as increased joint household decision-making, household savings and birth registration. Survey data collected in March 2021 revealed that the prevalence of stunting for children under the age of five among participating households was 52.8%, compared to 69.8% in non-participating households in the same areas. The greatest difference was seen in the under-two age group. This suggests that, despite the short duration of the project (three years), the delivery of cash plus complementary activities contributed to improved child nutrition outcomes.

Based on these findings, World Bank funding has been allocated to extend the project to 250,000 households in the poorest communes in 18 provinces over five years. In line with inflation and to support greater impact, recipient households are receiving USD54 every three months for 24 months, alongside the same SBC activities and support for job creation. Refugees and host communities are also being targeted. Rather than using Community Agents, mothers enrolled in Merankabandi who engage in positive nutrition practices are being recruited and trained to provide peer support. This aims to improve linkages between the cash and complementary components and improve project sustainability.

The Productive Safety Net Programme (PSNP) in Ethiopia

In Ethiopia, a new cadre of social workers provides individual integrated case management to cash transfer clients, linking them to multiple nutrition, health and agricultural services.

Efforts to link social protection and nutrition in Ethiopia primarily focus on the Rural PSNP. This is Ethiopia's largest social assistance programme, currently targeting eight million extremely poor rural households that are vulnerable to shocks and food insecurity with cash or food assistance, either in exchange for public works or unconditionally where the household has limited labour capacity ('direct support').

Evaluation findings of the PSNP III (2010–2014) revealed that, despite improving household food security, the programme did not improve nutrition outcomes for children (IFPRI, 2013). In response, and in the context of a strengthened nutrition policy landscape in Ethiopia, the PSNP IV (2015–2020) included explicit nutrition-related indicators and embedded nutrition provisions within its design to support improved access to a diverse diet, nutrition and care practices, and health and nutrition services to all participants (Box 1).

Box 1 Nutrition provisions of PSNP IV in Ethiopia

1. Introduction of 'temporary direct support' to excuse pregnant women, as well as caregivers of children under 12 months/children with wasting, from public works to support optimal nutrition and care practices.
2. Introduction of 'co-responsibilities' for temporary direct support clients, including attendance at health facilities and SBC sessions delivered by Health Extension Workers.
3. Increase in the nutritional value of food transfers (by including pulses in addition to cereals and oil) and in cash transfer values to enable the purchase of pulses.
4. Women enabled to receive distributions as joint household heads to enhance their control over household resources.
5. Introduction of a mechanism to scale up transfers in response to shocks using contingency budgets, thereby increasing the shock-responsiveness of the system.
6. Selection of public works projects that have nutrition benefits for the community (e.g., building childcare centres at worksites; water, sanitation and hygiene facilities; kitchen gardens; planting fruit trees).
7. Improvement of work conditions for women (half the workload of men; lighter work; building of childcare centres next to work sites).
8. Delivery of monthly two-hour SBC sessions for public works clients (with six sessions counting as one public workday).
9. Creation of linkages with support for nutrition-sensitive livelihoods for public works clients (e.g., poultry, goat's milk, fruit or vegetable production).
10. Involvement of the health sector in PSNP processes and planning.
11. Embedding of nutrition-related indicators and reporting on nutrition-related outcomes.

[1] https://www.ennonline.net/fex/68/socialprotectionkenya

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Merankebandi participant tending to her kitchen garden. Burundi, 2021

Results of an endline review of the PSNP IV found limited or no change in a range of nutrition outcomes and underlying determinants of nutrition. Food security improved marginally in the lowlands (reducing the food gap by 12 days per year), but not in the highlands. Dietary diversity marginally improved by 0.11 food groups in the highlands but not in the lowlands. Diets for young children (aged 6–23 months) and uptake of health services were no different in PSNP compared to non-PSNP households. Low nutritional impact was largely attributed to poor programme performance on the social transfer side (late and irregular transfers and low transfer value), as well as to the sporadic implementation of nutrition provisions due to budget limitations.

To explore further ways to improve the nutritional impact of the PSNP, the Ministry of Labour and Social Affairs (MoLSA), with technical support from UNICEF, implemented the *Integrated Basic Social Services with Social Cash Transfer (IN-SCT)* programme between 2016 and 2018 in four woredas in the Southern Nations, Nationalities and Peoples and Oromia regions. A case management approach was used to link direct support PSNP clients with an integrated package of services, including SBC, health and nutrition services, and agricultural extension and livelihoods support. PSNP clients continued to receive the regular PSNP transfer of 3 kg of cereals per day or a cash equivalent, depending on the context. An endline evaluation revealed successful linkages between clients and services by social workers, but little impact on child nutrition outcomes. In areas receiving additional nutrition-sensitive interventions (agricultural extension and livelihoods support) some improvements occurred in indicators along the nutrition impact pathway, including household dietary diversity, food security and breastfeeding practices.

Building on lessons learnt, a five-year *Integrated Safety Net Pilot (ISNP)* was launched in 2019 in four woredas in Amhara region and Addis Ababa by MoLSA with UNICEF technical support. The programme tests a similar case management approach to the IN-SCT pilot, with additional elements to strengthen linkages with health, nutrition, education and protection services. A new cadre of social work staff (Community Service Workers) has been recruited to provide more consistent individual case management, supported by a new digital information management system and improved enrolment and referral systems.

Building on lessons learnt from the PSNP IV, further nutrition-sensitive design provisions have been integrated into the wider PSNP V with World Bank support. These include the selection of nutrition-sensitive assets for public works projects; embedded case management and referrals to health and nutrition services; enhanced nutrition SBC for PSNP clients; the transference of women from public works to 'direct support' during pregnancy until their child's first birthday; the mobilisation of female 'nutrition champions'; and the provision of childcare at public works sites. The PSNP V also has an improved shock-responsive component to allow the scale-up of transfers, both horizontally (reaching more participants) and vertically (achieving higher transfer values), in response to crises. Future evaluations of the PSNP will rigorously assess the impact of these provisions.

The Stawisha Maisha programme in Tanzania

Stawisha Maisha targets SBC at participants of the government's cash transfer programme to support the uptake of positive infant and young child feeding (IYCF) practices among chronically poor households.

The Productive Social Safety Net (PSSN) II programme (2020–2023) is the Government of Tanzania's social assistance programme, which targets 1.2 million participants in chronically poor households (identified by a common targeting system). Households with no labour capacity receive unconditional cash transfers ('direct support'), and those with labour capacity participate in public works for cash during the lean season. All participating households with children under the age of 18 also receive a variable cash transfer conditional on the uptake of health, nutrition and education services. PSSN II households receive bi-monthly cash transfers to the value of USD5.30 and USD24.10 per day, depending on the eligibility criteria.

UNICEF worked with the government between 2018 and 2019 to pilot the ***Stawisha Maisha Cash Plus programme*** in two districts. Stawisha Maisha tested the efficacy of delivering additional SBC sessions to PSSN II households to enhance IYCF practices alongside PSSN II cash transfers to increase access to nutritious foods. Peer-led SBC sessions were delivered to caregivers and other household members at PSSN payment sites on the six payment days throughout the year.

A total of 10,837 caregivers were reached with SBC sessions at 127 payment sites, and 85% of participants attended all six sessions. Weaknesses in evaluation methodology meant that definitive conclusions could not be drawn on programme impact. However, an endline review showed acceptance of the approach by participants, integration of activities into the social protection workforce and increased participant knowledge regarding IYCF. A key limitation was the use of written materials among a largely illiterate audience. On the cash side, programme performance was poor during 2019, with several missed payments due to funding shortages. Low coverage of health and nutrition services in some target areas meant that linking PSSN with services was impossible.

UNICEF and the Tanzania Social Action Fund (TASAF) worked together to design a second iteration of the Stawisha Maisha programme, which is now being implemented in Lake Zone. Design changes made in response to Phase One learnings include increased frequency of group meetings (now weekly); meetings within communities rather than at payment

sites; targeting of mothers and direct caregivers; and the use of radio as the main communication channel. Sessions will be supported through the distribution of wind-up radios, improved SBC materials and ongoing supervision by PSSN workers. A much stronger monitoring and evaluation system is being developed to provide valuable information to inform future integration and scale-up.

Lessons Learned

Evidence from these case studies show that ***cash transfers delivered alongside 'plus' interventions can help address barriers to optimal nutrition*** by addressing financial constraints, access to nutritious foods, uptake of nutrition and other services, and improving care and feeding practices. This is best achieved when social protection and nutrition colleagues work together to design and implement joint programmes.

Cash plus programmes have the greatest potential for impact when ***cash transfers are of adequate value, regular, predictable and paid on time***, and when plus elements are delivered to the same population in tandem. Learning from Burundi shows that the latter requires joint planning, system linkages and regular communication between social protection, nutrition and other workforces.

Delivering ***SBC alongside cash transfers*** can 'nudge' vulnerable populations towards optimal child feeding and care practices. SBC can be delivered by trained community volunteer cadres within the health system (as in Burundi), or by the social welfare system (as in Tanzania). Learnings from Tanzania and Burundi shows that SBC is more likely to be effective when the target population has access to quality nutrition services and diverse foods respectively.

A ***referral system for cash transfer participants to multiple services*** can increase access to, and uptake of, multiple services to support child nutrition and wellbeing, as demonstrated by the ISNP in Ethiopia. This will be most effective when clear referral pathways exist between sector workforces and when information systems are integrated or shared. Integrated case management services provide an effective means to manage referrals, and this can be delivered by trained community volunteers (as in Ethiopia).

Experiences in Burundi demonstrate the potential of ***kitchen gardens and support towards increased household savings, livelihoods and job creation*** to improve household earning for transfer participants and to sustain access to diverse foods for children. Tailoring livelihoods interventions to support the availability of nutrient-dense foods for children, such as by providing seeds and small livestock, can help families put nutrition SBC messages into practice.

Cash plus programmes must be robustly ***monitored and evaluated*** to provide quality evidence. Monitoring frameworks should be designed to show impact across the nutrition impact pathways, including indicators to measure short-term change (such as dietary diversity, changes in practices and access to services) and longer-term nutrition outcomes. Findings can be fed into the design of each programme iteration, as in Ethiopia, to ensure that learning leads to programme improvement and increased impact over time. Robust information will also support advocacy for investments as part of future scale-up.

Conclusions

Increasing domestic and external resources are being invested in the development of large-scale government social assistance programmes in the ESA region to target financial assistance to the most vulnerable members of society. These programmes provide a valuable opportunity to address poverty as a key underlying cause of child undernutrition. The country examples provided here show that, by intentionally including nutrition provisions within their design and adding nutrition-responsive 'plus' elements, social assistance programmes have the potential to address multiple barriers to optimal child nutrition (beyond financial barriers) to achieve positive change along the nutrition impact pathway. Scale-up of programmes in many of the countries is of course critical for contributing to national poverty reduction and nutrition goals. Engagement of multiple sectors (including nutrition) in social policy efforts, as well as in the design and evaluation of social assistance programmes, is critical to making this a reality.

One future opportunity in the ESA region involves the integration of shock-response mechanisms within national social assistance programmes to allow scale-up of cash or food assistance in response to crises. This will help prevent malnutrition in the face of increased climate-related shocks in the region as part of wider malnutrition prevention and nutrition resilience strategies. Opportunities also exist to improve the nutrition-responsiveness of wider social protection systems to support sustained change. This might include improved employment rights for women to support optimal IYCF practices, as well as health insurance schemes to support universal health coverage, including universal access to nutrition services such as treatment of wasting, micronutrient supplementation and counselling. Food systems transformation efforts are also critical for improved and consistent availability of nutritious foods, especially protein sources, to ensure that social assistance translates into improved diets for young children.

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A digital messaging intervention and remote data collection to support early child development and nutrition: **Telangana, India**

A group counselling session in Telangana, India

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KEY MESSAGES

- This article explores the development of a digital messaging intervention and of methodologies to collect data remotely during the COVID-19 pandemic in Telangana, India, which targeted message recall, early child development (ECD) and infant and young child feeding (IYCF) practices.
- The digital messaging intervention leveraged an existing opportunity in Telangana, one of the states with the highest penetration of mobile phones and internet usage, including ownership of phones among women, which ensured that messages delivered through the intervention achieved significant reach among beneficiaries.
- While digital messaging is a promising model for ensuring messages reach women, it cannot replace the critical interpersonal communication offered by frontline workers. Both models are therefore complementary.

Background

The COVID-19 pandemic and its associated lockdowns have impacted the health, nutrition and learning of children in multiple ways (Yoshikawa et al, 2020). These include impacts of protracted lockdowns and family unit disruptions on immediate socioemotional development outcomes, including adverse effects on children due to increased caregiver stress; the trickle-down economic implications on household food availability; direct infection from the virus itself, both in the immediate and longer-term; and the implications of curtailing progress towards meeting the Sustainable Development Goals (United Nations, 2020). Restrictions imposed during the pandemic have reduced access to social services, especially for vulnerable populations, with a knock-on effect on multi-sector initiatives and child health services such as school feeding programmes and child immunisation (Pérez-Escamilla et al, 2020).

Despite these disruptions, community workers – including Anganwadi workers (AWW) in India – have demonstrated both resilience and industry (Nanda et al, 2020), distributing food to families to support complementary feeding for young children and using technology to deliver relevant nutrition and health messages. The distribution of family-level food allowance, or 'ration', was among the least disrupted child health services, with periods between lockdowns seeing the moderate resumption of this service (Avula et al, 2022).

At the onset of the COVID-19 pandemic, community-level service delivery for components under *POSHAN Abhiyaan* (the National Nutrition Mission) were brought to a standstill in India. The Department of Women Development and Child Welfare (DWDCW), the Government of Telangana and UNICEF conducted rapid online assessments to better understand service delivery gaps within the Integrated Child Development Services (ICDS) and the National Health Mission. While improvements were reported in take-home food ration and growth monitoring, counselling services re-

mained unavailable for over 90% of beneficiaries. In response to this unmet need and to complement *POSHAN Maah* (Nutrition Month), a digital messaging intervention was developed in September 2020 for dissemination in the community. Sangath, a not-for-profit organisation, led the development of this counselling intervention as part of the wider *Aalana Palana* intervention (Box 1) that was initiated in the state before the COVID-19 Pandemic.

This article explores the development of this digital messaging intervention and the methodologies used to collect data remotely during the pandemic, targeting message recall, ECD and IYCF practices.

Box 1 The *Aalana Palana* intervention

The *Aalana Palana* intervention is a part of **ASPIRE** (**A S**calable **P**rogramme **I**ncorpo**R**ating **E**CD interventions), a collaboration between Sangath, DWDCW and UNICEF. *Aalana Palana*, which is delivered by AWWs at the community level, aims to design and pilot an integrated ECD and nutrition video intervention promoting nurturing care in the first 1,000 days of life. *Aalana Palana* in Telugu implies a caring and nurturing environment provided by caregivers to their children. Such an environment includes adequate nutrition and responsive and sensitive caregiving, including opportunities for learning and access to quality health services. *Aalana Palana* draws from the internationally promoted Nurturing Care Framework on ECD that provides healthcare providers and caregivers with guidance on giving children the best start in their lives.

Methods

Development of the digital messaging intervention

The rationale of developing this digital intervention using multimedia formats (video, audio and text) was based on existing mobile and internet access in Telangana. National Family Health Survey 5 (2019–21) data show that over 75% of households in the state have at least one mobile phone, with over 50% of women in rural Telangana and 75% of women in urban Telangana having ownership. Internet availability is at 42% across the state.

To develop key messages on ECD and nutrition, the *Aalana Palana* team reviewed relevant literature, including UNICEF and WHO guidance for supporting responsive parenting strategies during the pandemic (Parenting for Lifelong Health, n.d.; UNICEF, n.d.). The team produced a messaging matrix to guide the development of key messages (Table 1).

Since shorter videos often receive more views (Ferreira et al, 2021), the video and audio messages were kept brief at between 60–120 seconds in duration. All messages included information to address challenges regarding access to resources, limited mobility outside the home and associated stress in both children and caregivers. The appropriateness of the messages was checked with AWWs who had considerable experience of working in the community, especially during the pandemic.

The final set of messages across the media mix was shared with AWWs, and two virtual training sessions were carried out to optimise circulation of the content across multiple platforms. Messages were made available on the DWDCW website and on a state-hosted YouTube channel.[1] Social media channels (Facebook and Instagram) were also used. AWWs forwarded the messages to WhatsApp groups for pregnant and breastfeeding women and their family members. Text messages reiterating key points were sent by centralised servers managed by DWDCW to registered mothers. In addition, AWWs further discussed the messages during their limited in-person interaction with women during the distribution of the take-home food ration.

For families who did not have internet or smartphone access, and to supplement social media messaging, other media included in this intervention were direct phone calls to families through a government-operated line and communication with AWWs through a satellite television channel operated by the DWDCW, known as T-SAT.

Table 1 Messaging matrix

Video messages	
Pregnant mother (3 messages) Health indicators to be checked during pregnancy. Dietary tips for pregnant and breastfeeding mothers. Family support for pregnant women and childcare.	**Complementary feeding (2 messages)** Feeding child with love and care (responsive feeding). Complementary feeding: frequency and quantity.
Text, audio messages and images	
Pregnant mother care (9 messages) Registering at the Anganwadi Centre (AWC) and antenatal care (3 messages). Micronutrient supplementation (1 message). Healthy diet for pregnant mothers (3 messages). Preparing for delivery (2 messages).	**General wellbeing messages in the context of COVID-19 (11 messages)** Stay informed – reassure. Missing friends? Here are some ideas. Turn off the gadgets, light up a conversation. Let's squeeze this stress ball together. Daily exercise adds value to your life. The more we learn, the more we know. Making routines – creating a rhythm. Be prepared … be safe. Stay positive Breathe in … breathe out Healthy mothers make healthy families
Breastfeeding messages (2 messages) A healthy mother nurtures a healthy baby. Breastmilk makes your baby stronger, sharper and healthier	
Complementary feeding (4 messages) Eat right, be bright. Eating all kinds of food makes children less fussy eaters Clean hands give us clean food. It's OK to make a mess.	**ECD messages (8 messages)** A much-loved child feels safe and secure. Let's sing together. Stretch together … physical activity is fun. Playing together makes children smarter. Peek-a-boo: I can see you. Learning is fun … it can happen inside or outside. Talk more, bond more. A father can be a child's best friend.

Remote data collection on coverage and recall of the digital messaging intervention

A message recall survey was conducted with 5,377 randomly selected pregnant women and mothers of children under two years of age in 16 districts of Telangana. These women were contacted through telephone calls and WhatsApp messages, and asked questions about whether they had received any digital counselling messages from the health system, the format and content of the messages, whether they had any further queries, who they reached out to for answers, and who they shared the messages with. Coverage of the digital messaging intervention was also assessed via tracking the number of WhatsApp groups created between frontline workers (including AWWs and families in their catchment area) on which these messages were circulated widely. Impressions on social media – including views, comments and shares – were tracked to estimate coverage on these platforms.

Remote data collection on ECD and IYCF practices during the COVID-19 pandemic

A random sample of 242 pregnant women and mothers with children aged 6–36 months residing in the catchment area of 30 AWCs were randomly selected and approached for the telephone interviews.

[1] https://icds.tgwdcw.in/AalanaPaalana

Box 2 Survey components featured in the sub-study

- Household financial security, including information on loss of employment
- IYCF practices, using the WHO Complementary Feeding Questionnaire (adapted) (WHO, 2021)
- Quality and extent of stimulation available to a child in the home environment (both interaction and physical environment), adapted from the Family Care Indicators (Kariger et al, 2012)
- Healthcare service provision through AWC for pregnant women and children, including measurement of height and weight, food supplementation and deworming
- Measurement of exposure to violence or neglect at home

Data were collected using a semi-structured questionnaire, which consisted of adapted versions of standardised questionnaires and additional questions based on a literature review (Box 2). Owing to the telephonic mode of administration, certain items – such as measuring the quantity of food the child ate using a standard bowl – had to be omitted. Questionnaires had to be reduced in order to minimise the administration time of the interview. Mock administrations were conducted within the team in order to test the final questionnaire.

Calls were made by a research assistant from Sangath who had had previous interactions with these families during a baseline conducted under the ASPIRE programme (the results of this baseline are not presented in this article). This existing rapport was used to increase the chances of participation and cooperation in the sub-study. The research assistant was trained on administering the questionnaires and on obtaining and recording consent over the phone. An Excel database was maintained that contained demographic details, as well as a record of call attempts.

Given the sensitive nature of certain questions, specifically those pertaining to violence towards the child and mother, information regarding helplines was provided and a follow-up was completed to check whether the family had received any required support.

Since the questionnaire took 20–30 minutes to administer, flexibility was offered regarding time of the day and the number of sessions across which the questionnaire could be delivered.

Ethical review and quality control

Participant consent was recorded over the phone after obtaining permission from the respondent. Prior to obtaining consent, an information sheet was read aloud and caregivers were encouraged to ask questions.

The study was cleared by the Sangath Institutional Review Board.

Results

Digital messaging intervention

During *POSHAN Maah* and the extended digital counselling rounds conducted between September and December 2020, 27,757 WhatsApp groups were created by AWWs with their beneficiaries. This represented 78% of AWCs in the state. The remaining AWWs could not reach out to participants in their catchment area due to poor internet connectivity. 227,000 (94%) pregnant and lactating women and 423,000 (65%) parents and other family members of young children (aged 7–72 months) were reached through these groups.

Using a mobile phone to deliver health interventions during the COVID-19 Pandemic, India

© Sangath

Message recall survey

WhatsApp messages reached more than 60% of all registered women beneficiaries in the state. Besides these direct beneficiaries, 100,000 (60%) Village Panchayat members, municipality post-holders and women collectives received these messages. It was estimated that 1,500,000 people were reached across social media between September and December 2020.

Across 16 districts, an average of 84% of women recalled receiving messages in the week preceding the survey via WhatsApp. Results were largely comparable across districts, ranging between 81% and 89% (13 districts), with 77% in one district (Adilabad) and 61% in another

Among women who were able to recall messages, 97% were able to remember pregnancy care-related messages, followed by 93% for breastfeeding messages, and 77% for complementary feeding messages. A total of 97% of women reported receiving these messages on WhatsApp groups created by their AWWs, and 88% of women reported sharing messages among their peers and discussing it further with AWWs and family members.

Sub-study on ECD and IYCF during COVID-19

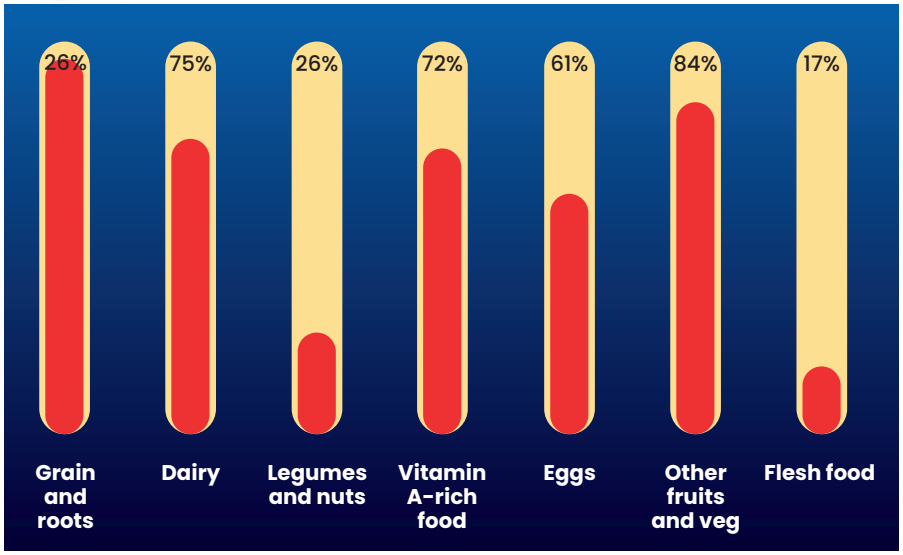
Of the 242 caregivers approached for the sub-study, 208 responded and consented to participate. Thirty-one caregivers were not contactable, and three children were deceased.

The results of the sub-study indicated that 51% mothers reported receiving support from family members when feeding their children during the pandemic. Paternal participation in child feeding was reported by 18% mothers. Additionally, 71% mothers reported receiving food from AWCs both before and during the COVID-19 lockdown. Only 43% were able to get their child vaccinated, and 39% were able to get their child's height and weight measured both before and during the COVID-19 lockdown.

For parent–child interactions, 34% to 42% of caregivers reported playing, reading, singing, etc. with their child during the pandemic, yet had not engaged in such activities before the onset of the COVID-19 pandemic.

Most children (95%) received grains and roots in their diet, followed by other fruits and vegetables (84%), dairy products (75%), Vitamin A-rich foods (72%) and eggs (61%) (Figure 1). A quarter of children received legumes and nuts (26%). Flesh foods, including bird or animal meat & products made from these items, were consumed by 17% of children. Almost

Figure 1 Consumption of different food groups by children in the sub-study



two-thirds (63%) of children received the WHO recommended minimum acceptable diet in the 24 hours preceding the survey; 73.5% received four or more food groups; and 92% received the recommended number of meals.

Lessons learned

This digital messaging intervention built on the opportunity provided by Telangana being one of the states with the highest penetration of mobile phones and internet, including ownership of phones among women. This ensured that key messages delivered through this intervention across multiple themes achieved significant reach among beneficiaries.

Key lessons learned from the development of the digital messaging intervention, as compared to in-person messaging, centred around making the messages sufficient in themselves so they would be effective even in the absence of a facilitator going through them with the families. This included significantly simplifying language, using colloquial terms and elaborating concepts. For audio recordings, increased importance was given to voice modulation and using a conversational tone to make the messages appealing enough for caregivers.

A key challenge, however, remained of customising messages to cater to the individual needs of families. To address this, customised tele-calling was later initiated for women to address specific concerns; however, this was possible only in a smaller geographic location. In addition, the digital messaging intervention served as a tool for AWWs to engage in discussions with community members, ensuring continuity of counselling services and uniformity in messaging and minimising information loss.

The messages developed for digital delivery have been integrated into various government schemes, including the wider *Aalana Palana* video intervention. The dissemination of messages on WhatsApp groups not only enabled two-way interactive communications, but also helped create peer networks within communities to support women during pregnancy and after childbirth. It is noteworthy that many of these peer networks continued giving support to women and mothers after the lockdown.

In addition to the findings from the two cross-sectional surveys presented above, later interactions with beneficiaries after the easing of the pandemic-related restrictions showed an encouragingly high rate of recall of key messages. During these exchanges with ICDS functionaries at community-based events, as well as during home visits by AWWs, it was observed that women who were exposed to the digital messaging intervention were able to recall messages and had adopted certain promoted behaviours. These included behaviours on pregnancy care and hygiene, such as maternal nutrition supplementation, deworming, managing stress during the pandemic and handwashing during food preparation, as well as before and after feeding children. Messages on the role of fathers and other care providers in supporting mothers in childcare and feeding were also remembered.

A major challenge of the telephone surveys was the fatigue encountered by respondents, which at times impacted the quality of their responses. Another consequence was the inability to complete all questionnaire sections in a single session, on occasion requiring multiple attempts to contact caregivers. The duration of the phone calls was further increased when families, who were already in a state of stress due to the pandemic, discussed their personal struggles, deviating from the actual interview.

Conclusion

Our experience demonstrates that a mix of high-dose universal digital messaging, in combination with targeting specific individual needs through one-on-one counselling, is a possible way forward for ECD and nutrition. While digital counselling is a promising model to ensure that messages reach their target audience, it cannot replace the critical interpersonal communication with frontline workers like AWWs. Both models are complementary. A community-based mechanism for triaging pregnant women, mothers and young children into high-risk categories and providing them with additional home visits or creating referral pathways for specialised consultations is also required.

Digital platforms can also support the incorporation of data collection methods through chatbots or e-surveys alongside coverage of digital messaging, to ensure systematic collection of process indicators and data related to improvement in knowledge levels.

The lessons learnt from *Aalana Palana* during this unprecedented pandemic and associated lockdowns can be expanded to support young children and their caregivers in future disasters. Such disaster preparedness will be essential to ensure that services to the most vulnerable of our populations are minimally disrupted in the future.

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Farmers harvesting rice in Madagascar

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Field Article

Emergency response preparedness: Rollout of the Global Nutrition Cluster's toolkit for country coordination teams

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KEY MESSAGES

- Since prioritisation of emergency response preparedness (ERP) in the 2022–2025 Global Nutrition Cluster (GNC) Strategy, the GNC has developed extensive ERP resources and provided tailored support to countries to help them create preparedness plans.
- To date, only eight of the 70 priority GNC countries have incorporated preparedness into their response plans.
- More work is needed to explore why countries are not adequately prioritising ERP, as well as to address emerging challenges such as insufficient awareness and/or access to ERP resources (particularly at sub-national level) and inadequate tailoring of ERP planning to local needs.
- In the future, the GNC should consider sharing the experience of other countries during the development of ERP plans, as well as providing guidance and support around advocacy for, and mobilisation of, domestic financing for ERP.

Background

In 2022, global challenges, such as the ongoing war in Ukraine and droughts in the Horn of Africa and the Sahel, disrupted food supply chains, caused crop failures and loss of livestock and led to increased hunger and malnutrition worldwide. According to the 2022 Global Humanitarian Overview, 274 million people required humanitarian assistance and protection – a significant increase from 235 million in 2021. Effects from these simultaneous global crises, combined with the effects of persistent conflict and climate change, highlight the need for more resilient and sustainable country responses to climate-related disasters and other humanitarian emergencies.

To increase their resilience, countries must be prepared for emergencies and have a timely and efficient response plan in place. Since mid-2022, the GNC has been providing tailored country support on preparedness, working remotely with multiple Nutrition Clusters/sectors to enrich draft ERP plans (Bangladesh and Myanmar), design ERP workshops (Niger, Madagascar and Nigeria), facilitate orientation sessions on the ERP approach (Mali and Somalia) and co-facilitate ERP workshops (Bangladesh and Nigeria).

However, to date, few GNC priority countries have incorporated ERP into their work. This article presents the results from an online GNC survey on countries' ERP efforts, and showcases how four countries (Afghanistan, Bangladesh, Myanmar and northeast Nigeria) have started to mainstream ERP into their work.

The ERP approach and toolkit

In an article published in issue 67 of Field Exchange (Dobamo, 2022), the author described increased prioritisation of ERP in the 2022–2025 GNC Strategy. After one year of the strategy's implementation, the GNC committed to delivering on this priority by transforming its existing preparedness guidance into an extensive ERP Toolkit (Global Nutrition Cluster, 2022). The toolkit includes everything a country needs to create a preparedness plan, including a step-by-step guide, an ERP plan template, a preparedness actions workplan template, and additional tools to support standardising and systematising the

ERP approach to effectively respond to the next emergency. A complementary e-learning short course was also produced to further support a country's preparedness efforts (UNICEF & Global Nutrition Cluster, 2022).

Following the release of the toolkit, three global virtual ERP workshops[1] were organised between July and December 2022 to coach participants on the use of the tools. These workshops aimed to strengthen Nutrition Cluster/sector capacities in ERP planning. In total, 87 personnel from 38 countries and territories participated in the workshops, including staff engaged in coordination and information management (IM) for nutrition and staff from government institutions, United Nations (UN) agencies, and non-governmental organisations (NGOs) based at national and sub-national levels.

GNC online survey

Despite the GNC's efforts, only eight of the 70 GNC priority countries have incorporated ERP into their response plans (Global Nutrition Cluster, 2023). In February 2023, a survey was sent to 262 Nutrition Cluster Coordinators and IM Officers in GNC priority countries to identify why countries were not adequately prioritising ERP, as well as to explore their challenges regarding ERP planning, so that the support provided by the GNC could be adjusted accordingly.

Not counting 'bounce-back' emails and the use of incorrect email addresses, a total of 194 members of country personnel received the survey, of whom 16 responded (6.1% response rate). This number was lower than anticipated, and may further reflect the lack of ERP prioritisation in country response plans. However, to our knowledge, most priority countries are not progressing well in their preparedness plans, and further inquiries must be conducted to fully understand the challenges faced.

Of the 16 respondents, 50% stated that their country's commitment to ERP was of moderate importance, and 37% reported that it was of high importance. Despite this, six respondents indicated that they lacked the human and/or financial resources, as well as the time, to address ERP. For the five countries that reported 'low importance', reasons given for this varied from preparedness not being fully understood by partners or cluster members and nutrition not being seen as a priority, to the need for more orientation and training on how to design and implement ERP plans.

In some cases, survey answers reflected a lack of prioritisation of nutrition in country response plans. In others, they reflected a lack of focus on ERP for nutrition on existing coordination platforms due to competing priorities. The need for continuous advocacy for financial resources for nutrition or allocation within the domestic budget was also reported. Some responses highlighted that, in instances where ERP plans were developed, they might not be implemented, and partners might not even know they exist. Respondents further emphasised the complexity of ERP planning in a challenging operating environment (especially with multiple ongoing crises) and explained that, although ERP planning is more relevant when operationalised at sub-national level, cluster coordination positions are overwhelmed with responsibilities.

Approximately 83% of respondents agreed that reflecting on past emergency responses could help identify bottlenecks restricting the scale-up of their nutrition response, thereby supporting the value of ERP efforts; 40% reported that a lessons learned exercise had either been conducted or was ongoing.

Conclusion and next steps

Despite support from the GNC on ERP during 2022, uptake of the approach in priority countries is low, and ERP is yet to be mainstreamed into GNC work. Findings from the GNC online survey and the country experiences documented here indicate the need for further support from the GNC, particularly relating to strengthening the ca-

[1] ERP workshop recordings are available at: https://www.youtube.com/playlist?list=PLgaJD9KLkq2IMc0ChEA8BvjQ1_jJDXfnS

Country experiences

Afghanistan

In 2023, the Nutrition Cluster in Afghanistan recognised the importance of bolstering its emergency preparedness in regions that are vulnerable to risks. Under the leadership and coordination of the Afghanistan Nutrition Cluster IM Specialist and of the Afghanistan Nutrition Cluster Deputy Nutrition Cluster Coordinator, several meetings were held with zonal cluster coordination teams to chart a roadmap for the ERP work. Under the guidance of five zonal coordinators, the teams conducted a hazard and risk analysis, built crisis scenarios and predicted immediate needs.

The National Cluster Coordination team provided support by compiling essential data and information to inform ERP planning. Regular meetings were held to review each dataset and reach consensus on its use. Additionally, partners' response capacity was mapped to ensure that all available resources were utilised effectively within their project duration.

Next, the regional coordination teams engaged with nutrition partners to develop an early response plan and derive preparedness actions. All ERP planning information was to be consolidated in a finalised nutrition ERP plan, expected by mid-April 2023.

The successful implementation of ERP in Afghanistan has been primarily attributed to effective leadership and engagement of the zonal-level cluster coordinators. While limited availability of hazard information challenged the planning and execution of the ERP, these coordinators played a crucial role in building trust among stakeholders and ensuring access to relevant information and implementing partners. Additionally, the interzonal-level meetings fostered a collaborative approach to reviewing available information and in developing the ERP plan, while improving understanding of ERP and resource utilisation. The proactive efforts of the cluster will help ensure that the most vulnerable communities are adequately prepared and protected during crises.

Bangladesh

In 2022, the Bangladesh Nutrition Cluster aimed to develop a comprehensive nutrition-specific ERP plan to better respond to recurrent seasonal shocks. The Nutrition Cluster received support from the GNC to design and facilitate a national-level ERP workshop with nutrition partners. Following the workshop, the development of a nutrition ERP plan began (currently in its final stages), and efforts are being made to cascade ERP efforts to risk-prone districts. For example, an ERP planning exercise took place in a flood-prone area in Kurigram district on 16 November 2022, where selected members of the District Disaster Management Committee (DMC) and Upazila (sub-district) DMCs participated. The Nutrition Cluster also organised a sub-district-level ERP workshop on 22 December 2022, with participation from selected members from both the Upazila DMC and the Union DMC from Olipur and Chilmari sub-districts respectively.

While sector-specific ERP plans for risk-prone areas are not typical in Bangladesh, the need for a nutrition-focused ERP plan became apparent during the GNC workshops. Since the workshops were the first time that district and Upazila-level DMC members had heard about the need for a sector-specific plan, it took time to convince them of its necessity for adequate and timely responses to emergencies. The UNICEF team in Bangladesh supported this process by demonstrating the contribution of poor feeding practices and inadequate treatment facilities during and after emergencies to the nutritional status of children under the age of five in their district and sub-districts. As a result, the DMC management are developing a nutrition-focused ERP plan to be finalised at the end of April 2023, and the Bangladesh Nutrition Cluster is planning the development of several other ERP plans at district and sub-district levels in 2023.

"Earlier, we did not realise the importance of a nutrition-focused ERP plan. This is the first time we are going to develop a nutrition-focused ERP plan in Bangladesh with support from GNC."

- From a sub-national workshop participant

Northeast Nigeria

To strengthen northeast Nigeria's level of emergency preparedness ahead of the general elections and the next lean season, the nutrition sector of the Maiduguri coordination hub (supporting the humanitarian response in Borno, Adama and Yobe States) received support from the GNC to design and co-facilitate a virtual three-day ERP workshop, with additional support from UNICEF and Action Against Hunger. The workshop aimed to strengthen sector partners' ERP capacity and enable the development of an ERP plan.

The nutrition sector coordination team agreed that the sector co-coordinator should lead the ERP workshop, and partners who had played key roles in the previous lean season response were selected to be involved in the preliminary ERP work. This team, known as the ERP Task Team, engaged with the GNC ERP consultant to develop a context-specific Terms of Reference document, an agenda and content for the workshop, as well as to plan for, and support, facilitation of the workshop. The ERP Task Team also selected 25 partners – including UN agencies, international NGOs, national NGOs and the Ministry of Health (with representation at national and state levels) – to participate in the ERP workshop.

Following the workshop, the nutrition sector began developing the nutrition ERP plan, aiming to complete this process within two months. Development involved refining the risk monitoring approach (with a nutrition lens), deriving a short crisis scenario and mapping partner capacity. Feedback from the nutrition sector team during the workshop showed that involving partners and government counterparts from the beginning encouraged buy-in and ownership of the ERP process. It also exposed them to the workshop planning tools and preliminary ERP actions, which would support further development of ERP plans for various contexts and risks, should this be undertaken.

It was noted that the three days did not provide sufficient time for the ERP workshop activities. It was therefore recommended that, in future, a five-day workshop should be held, including two days for ERP training and three days to complete the ERP planning steps.

"I consider the nutrition emergency response planning for northeast Nigeria a stitch in time that could save nine. No doubt, a well-designed nutrition emergency response plan could mean the difference between life and death in the event of an emergency."

– Dr Mike Lawani, Yobe State Nutrition Programmes Facilitator, UNICEF

Myanmar

Myanmar was among the first countries to pilot an ERP approach, following an initial three-day ERP workshop organised by the Myanmar nutrition sector in April 2021. Since then, a draft ERP dashboard has been developed, and both the workshop and dashboard are serving as the foundation for continued ERP processes in 2023. In addition, under Myanmar's guidance, the OCHA-led ERP working group has been involved in current ERP efforts, which include holding monthly meetings.

Following attendance at a second GNC ERP workshop in July 2022, the Myanmar Nutrition Cluster held preliminary meetings to agree on utilising the GNC's ERP tools and templates. The Nutrition Cluster also worked on strengthening coordination platforms in five sub-national areas by training personnel, extending consultations to local NGOs and community service organisations, and designing tailor-made response delivery modalities.

While ERP is led at a national level, considering sub-national levels is critical, as regions experience different emergencies and a national ERP plan would have to be adapted to each area independently. As a result, Nutrition Cluster focal points were engaged to organise orientation meetings with sub-national Nutrition Cluster focal points and share templates for ERP consolidation, to speed up execution of the ERP plan. Additionally, the sub-national Nutrition Cluster engaged with partners on various ERP steps including identifying and ranking likely hazards, budgeting, planning appropriate responses, estimating potentially affected populations and drafting sub-national-level scenarios and responses. Where shortcomings were identified, dedicated support was provided to the consolidation exercises of sub-national states/regions. This, along with strengthening coordination at the sub-national level, aims to contribute to the development of a national ERP plan.

ERP planning in Myanmar has been challenged by a restrictive operating environment complicated by conflict, difficult consultative engagements/restricted access to partners and burn-out of critical staff. Funding gaps have also resulted in the termination of sub-national coordinators' contracts, and 'double-hatting' of several sub-national Nutrition Cluster Coordinators has overwhelmed individuals and resulted in the reprioritisation of their coordination responsibilities.

Completion of the ERP plan is also a time-consuming consultative process, which the Nutrition Cluster team is working on at the same time as it is working on the Cluster workplan. However, the Myanmar Nutrition Cluster aims to finalise the ERP plan before the beginning of the monsoon and hunger seasons in the second/third quarter of 2023.

"Rakhine is one of the state regions with the highest level of acute malnutrition, worsened by the highest number of stateless persons – close to half a million – and more than a third of a million internally displaced persons. Additionally, the region is prone to cyclones, natural disasters and landslides. Therefore, a comprehensive emergency response preparedness plan helps meet the needs of those affected by a protracted humanitarian crisis amidst reduced funding and increasing needs."

– Mr Aung Thu Chai, Sub-National Nutrition Cluster Co-coordinator

pacity of cluster members and sub-national-level actors on preparedness and encouraging countries to develop an ERP plan. More work is required to increase countries' awareness of the ERP Toolkit – this should include conducting more ERP workshops to continuously orient and train countries on the ERP approach, and providing dedicated support until ERP is truly mainstreamed in the day-to-day work of nutrition coordination teams. One strategy to facilitate mainstreaming may be to include ERP as a key deliverable within the coordination roles of Nutrition Clusters/sectors.

Additionally, too little is being done to reach personnel located at the sub-national level, and that many may have limited access to tools and resources posted on the GNC website and/or other relevant sites such as HR.info or Reliefweb. The Nutrition Cluster/sector coordination bodies based in country capitals have a responsibility to ensure that the ERP Toolkit is disseminated and that ERP planning is fostered locally and tailored to local needs. It may also be worth exploring how to tie ERP planning together with localisation agendas to maximise implementation of early and efficient nutrition responses with locally available capacities – in most large-scale emergencies, local actors are often frontline responders and need to be engaged from the preparedness phase.

While this work has provided valuable insights, further exploration is needed into why countries are not adequately prioritising ERP, as well as to explore the challenges they experience. This will help the GNC better advise on systematic integration of ERP across workstreams and support increased buy-in of the ERP approach in countries. It was also suggested that the GNC should share the experiences of other countries during the development of ERP plans, providing guidance and support around advocacy for, and mobilisation of, domestic financing for ERP.

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How do children with severe underweight and wasting respond to treatment?

This is a summary of the following paper: *Odei Obeng-Amoako G, Stobaugh H, Wrottesley S et al (2023) How do children with severe underweight and wasting respond to treatment? A pooled secondary data analysis to inform future intervention studies. Maternal & Child Nutrition, 19, e13434* **https://doi.org/10.1111/mcn.13434**

Evidence shows that the most effective combination of indicators for identifying the highest risk of death in malnourished children under the age of five is a weight-for-age z-score (WAZ) < -3 and a mid-upper arm circumference (MUAC) < 11.5 cm (Khara et al, 2023). While including WAZ < -3 as an additional independent criterion for admission may improve the targeting of therapeutic treatment to the most vulnerable, a low WAZ is not widely used for this purpose, and there are various questions about its programmatic implications. This article presents findings from a pooled secondary analysis of existing research and programmatic data to better understand the growth trajectories and response to treatment of wasted children with WAZ < -3 within wasting treatment programmes, both supplementary and therapeutic.

According to the data used by the article, nine countries in Africa and Asia, a low WAZ was common among moderately wasted children (40% of admissions) and severely wasted children (60% of admissions). These proportions varied by context, with the highest prevalence of WAZ < -3 in India (90%) and the lowest in Kenya (32%). A low WAZ was more common in male than in female children, as well as in children aged between two and five compared to children below two years of age.

Wasted children with WAZ < -3 had lower recovery rates, a higher risk of death and a higher risk of transfer to inpatient care. While they gained weight in similar patterns to other wasted children, those with a low WAZ had markedly lower anthropometric measurements (height-for-age z-score [HAZ], weight-for-height z-score [WHZ] and MUAC) at admission and end of care. This suggests that these children have further to catch up and may require longer, or more tailored, treatment. This is particularly relevant for moderately wasted children with WAZ < -3, who are not currently eligible for therapeutic feeding in many contexts.

Overall, children admitted to community-based management of acute malnutrition (CMAM) programmes demonstrated modest HAZ gains during treatment. Children with moderate wasting had the lowest HAZ gains. Such children are likely to receive lower-intensity treatment than children who are severely wasted, and this may be insufficient to support catch-up growth. Particularly for children with severely low WAZ, a minimum intensity or quality of treatment may be required to promote linear growth, or at least to maintain HAZ.

Further, this analysis shows that children with oedema and severely low WAZ are at a comparatively greater risk of death than other groups, and are more likely to be stunted at admission. Treatment programmes do not currently consider these vulnerabilities, and more work is needed to understand and mitigate these risks.

As a next step, an intervention trial is needed to further explore these hypotheses. This trial should include non-wasted children with WAZ < -3, who are not currently represented in data from CMAM programmes.

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Khara T, Myatt M, Sadler K et al (2023) Anthropometric criteria for best-identifying children at high risk of mortality: A pooled analysis of twelve cohorts. Public Health Nutrition, 26, 4. https://pubmed.ncbi.nlm.nih.gov/36734049/

Postscript: Response from the authors

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This analysis, conducted by a subgroup of the Wasting and Stunting Technical Interest Group (WaSt TIG), supports evidence that children with wasting and WAZ < -3 are even more vulnerable to mortality and do not achieve traditional definitions of nutritional recovery as often as other wasted children. Wasted children with WAZ < -3 do gain weight in a similar pattern to other children with wasting, but they have further to catch up and therefore a longer or higher-intensity treatment may be needed. This is especially true for children with moderate wasting and WAZ < -3, who are only eligible for low-intensity treatment (if anything) in many settings. Those with severe wasting and low WAZ would already be eligible for ready-to-use therapeutic food (RUTF), but a higher intensity of RUTF is unlikely to be feasible. As a result, longer-treatment might be more suitable for them. Children with severely low WAZ as well as oedema are likely to require the greatest support, as they have the highest mortality risk.

The optimal length of treatment is something we would like to explore in a future analysis, both for wasted children with WAZ < -3 and for wasted children in general. Currently, many CMAM programmes have a 'non-response' definition of "no recovery within 16 weeks of starting treatment". Some programmes have even shorter treatment timelines than this. There is wide heterogeneity in terms of treatment times and recovery definitions within the database we used for this analysis, since it is a compilation of data from 13 CMAM programmes. Going forward, we therefore plan to explore the appropriateness of existing definitions of non-response, including the characteristics of so-called 'non-responders' and at which timepoint weight gain tends to plateau. Please see the Wasting and Stunting area of the ENN website, where you can find the WaSt TIG plans for this work.[1]

The definition of nutritional recovery also warrants exploration, since there was also much variation regarding this in our dataset. Our analysis classified a large proportion of children as 'early discharge' and 'non-response', which led to a very low recovery rate (approximately 25%). Our definition of recovery for this analysis was 'both MUAC > 12.5 and WHZ > -2', which was not the case for all the programmes included in the data. Some programmes discharged children once MUAC had recovered, but not WHZ. We do not know what would have happened to those children had they continued treatment; it is likely that some would have recovered according to our definition. In order to explore whether this affected our conclusions on children with severely low WAZ, we conducted an analysis using the different programmes' individual definitions of recovery (see Appendix Table 10 of the paper). This analysis showed that our conclusions remained the same, but the effect size of poor outcomes for those with WAZ < -3 diminished. This is an important consideration for anyone who is using our effect size to determine the sample size for a future study.

We very much hope that researchers will use our analysis to inform further studies. While continued secondary data analyses are needed, we do ultimately need intervention trials (such as the one outlined in the protocol designed by the WaSt TIG)[2] as these will include non-wasted children with WAZ < -3 (who are currently not represented in the available data from CMAM programmes), as well as a controlled range of treatment lengths and intensities. Primary research studies will ultimately confirm the type of treatment needed for vulnerable children with WAZ < -3 to survive and thrive.

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[1] https://www.ennonline.net/ourwork/reviews/wastingstunting

[2] https://www.ennonline.net/resource/newevidenceintopractice

Climate change and food security: The view from sub-Saharan Africa

This is a summary of the following paper: *Adesete A, Olanubi O & Dauda R (2022) Climate change and food security in selected sub-Saharan African countries. Environment, Development and Sustainability.* **https://link.springer.com/article/10.1007/s10668-022-02681-0**

Climate change is a global problem, yet its effects are – and will be – most keenly felt by the most vulnerable regions. As a continent, Africa is projected to warm to a greater degree than the global mean, and sub-Saharan Africa in particular will face significant rain variability. As the region is largely dependent on rain-fed agriculture, this meteorological variability is projected to impose a disproportionate impact on these countries and their communities. These events will compound existing drivers of food insecurity in the region, which is beset with high levels of poverty, eroding purchasing power. This paints a bleak picture, yet such challenges can only be targeted once the scale of the problem is identified and dissected.

This paper models the effects of climate change (Box 1) on 30 of the 46 identified sub-Saharan African nations. The sampled countries can be considered to represent the region as a whole, although care should be taken when interpreting the findings as greenhouse gas emissions and inflation rates were used as proxy indicators for climate change and food prices respectively. Gross domestic product per capita was used as a proxy for income level; the inverse of malnutrition prevalence (100-prevalence) was used as a proxy for food security; and food production was used as a proxy for food supply. Climate modelling is notoriously complex, relying on numerous assumptions, so these findings should act as a guide rather than as an absolute predictive model.

Box 1 How did the researchers predict the effects of climate change?

The researchers used panel data analysis, a method used in both epidemiology and the social sciences to analyse cross sectional and longitudinal 'panel data'. Panel data are a collection of values obtained across multiple individuals, which are then assembled over even intervals and subsequently ordered chronologically. Such data are used to reveal future trends by analysing how variables change over time.

The researchers then used a probability model to forecast the possibility of future results. In this case, a Gaussian Mixture Model, a type of analysis that uses normally distributed data (the 'bell curve') to predict the effects of climate change on this population.

Among other assumptions, the model presumes that higher food consumption results in the decline of malnutrition prevalence, that the demand for food is greater than domestic supply (food imports cover the remaining shortfall) and that climate change is a determinant of food supply. These can be considered appropriate assumptions based on the countries in question.

Data were taken from the identified countries between 2000 and 2019 and, given the increasing incidence of extreme weather events as a result of warming global temperatures, such predictions may become less accurate as weather patterns become more volatile in decades to come.

Broadly, the results indicate that climate change and increasing food prices have a negative significant effect on food security. Increasing income and food supply have a positive significant impact of food security in the region. These are not new findings, but the authors go further by distilling three key recommendations from these results.

A shift towards ***cleaner energy*** is necessary for climate resilience, and sub-Saharan African nations – although responsible for less emissions than developed economies – should intentionally transition to such energy systems. The support of developed nations (which also play a key role in incentivising the protection of forests, such as the Congo Basin) is integral to this, as a decline in carbon emissions is projected to increase agricultural productivity within the region.

Domestic production capacity should be improved through investment in the agricultural sector. Increased local production of food reduces vulnerability to external shocks from changes in the global price of commodities. An increase in domestic food supply will theoretically reduce food costs, which the model highlights as a route towards increased food security.

Policies that target ***increased incomes*** should also be prioritised to increase local purchasing power, although such an aspirational policy objective is questionable given the existing barriers to development in sub-Saharan Africa.

We already know that this region is particularly vulnerable to climate change and that little can be done to curb these effects without global cooperation. However, this paper does highlight the key drivers that can be acted upon by specific nations to ameliorate the effects of global warming by building food system resilience.

A group of people displaced from their homes due to floods, use a tarp to float down the Sobat River, searching for higher grounds in South Sudan

Research priorities for nutrition of school-aged children and adolescents in low- and middle-income countries

This is a summary of the following paper: *Lelijveld N, Wrottesley S, Aburmishan D et al (2023) Research priorities for nutrition of school-aged children and adolescents in low- and middle-income countries. PLOS ONE, 18, 1, e0280510.*
https://doi.org/10.1371/journal.pone.0280510

Background

Nutritional status during middle childhood (5-9 years) and adolescence (10-19 years) influences physical, cognitive and social development with implications throughout the life course and for future generations. However, the limited availability of prevalence data and a lack of nutrition targets for children and adolescents 5-19 years of age is hampering the development of policies and interventions to tackle malnutrition in this age group.

This paper presents the results of a research prioritisation exercise conducted by Emergency Nutrition Network in 2021 to stimulate and guide future research. Using the Child Health and Nutrition Research Initiative (CHNRI) method, a list of 48 research questions was compiled covering all forms of malnutrition (micronutrient deficiencies, thinness, stunting, overweight/obesity and suboptimal dietary quality) in children and adolescents 5-19 years of age in low- and middle-income countries. A stakeholder survey was used to rank questions according to their answerability, deliverability, effectiveness and potential to improve equity with an overall aim of achieving measurable reductions in the prevalence of malnutrition in the next 10 years.

Findings

Between 85 and 101 stakeholders with a broad geographical spread responded per research question. Of the overall top 10 ranked questions presented in Box 1, half focused on delivery strategies for interventions targeting school-age children and adolescents and the other half on improving existing interventions. The question that ranked highest focused on tailoring antenatal and postnatal care for pregnant adolescent girls. This question also ranked highest within the sub-category of questions for pregnant adolescent girls, as well as for having the greatest potential to improve equity. The ranking of questions was similar across age sub-categories thereby streamlining priority research questions across middle childhood, early adolescence (10-14 years of age) and late adolescence (15-19 years of age). There was higher expert agreement for questions related to in-school children and adolescents than for those related to out-of-school adolescents.

Conclusion

Overall, the CHNRI prioritisation exercise highlighted the need for implementation research to inform the delivery of effective nutrition interventions to school-age children and adolescents, beginning in schools. The findings also identified a need for academic research to inform the development and tailoring of existing interventions with a focus on how to package multi-sector programmes and how to better reach vulnerable and underserved sub-groups, including those out-of-school.

Box 1 Top 10 research questions according to the Child Health and Nutrition Research Initiative (CHNRI) exercise

1. How should antenatal and postnatal care interventions be adapted to effectively and cost-effectively support the specific health and nutritional needs of pregnant adolescents?
2. What strategies are effective for delivering interventions in schools to improve quality of diets and nutritional outcomes of school-age children (SAC) and adolescents?
3. What strategies are effective at involving SAC and adolescents in defining their own context-specific solutions to nutrition problems and does their involvement result in more effective interventions?
4. What are effective, context-specific, behaviour change communication strategies to improve diets and nutritional status of SAC and adolescents?
5. What improvements can be made to local food systems to support access to healthy diets in schools?
6. Does sex and/or gender impact the response to nutrition interventions (e.g., obesity prevention interventions) and how can interventions be better tailored to girls and boys?
7. What are the optimal delivery platforms (health, education, social protection, media/technology etc.) for effective uptake of nutrition interventions for SAC and adolescents, taking into account scale, sustainability and youth engagement?
8. What are the optimal delivery platforms for reaching the sub-groups of SAC and adolescents identified as highest priority?
9. What is the impact of peer education programmes on nutrition of adolescents and SAC in different contexts?
10. What combined package of existing interventions is effective at addressing malnutrition in SAC and adolescents?

Hot weather impacts infant feeding practices in low- and middle-income countries

This is a summary of the following report: *Edney JM, Kovats S, Filippi V et al (2022) A systematic review of hot weather impacts on infant feeding practices in low- and middle-income countries. Frontiers in Pediatrics, 10, 930348.*
https://doi.org/10.3389/fped.2022.930348

Due to concern that increased hot weather led to a rise in supplemental feeding rates due to infants requiring additonal fluids or the perception that infants are dehydrated, the authors conducted a systematic review of published studies to understand how hot weather conditions may impact infant feeding practices. They first reviewed evidence to consider whether exclusively breastfed infants could maintain hydration levels under hot weather conditions, assessing indicators of infant hydration such as urine concentration measures, total fluid intake or infant weight changes. They then examined the available literature on infant feeding practices in hot weather.

The 18 studies that met the inclusion criteria after they were assessed according to predetermined quality checklists showed no evidence that exclusively breastfed infants required additional water or other liquids. The authors found that exclusively breastfed infants maintain normal hydration levels without concentrating urine to maximal levels. Supplementary water also does not appear necessary for exclusively breastfed infants that are low birthweight or born near-term.

The authors describe multiple potential pathways by which hot temperatures and weather may influence infant feeding practices, including fear of infant dehydration and the belief that infants require water and/or other liquids alongside breastmilk in hot weather or seasons. Other factors that are highly seasonal and/or weather-dependent, and which could be associated with reduced time spent breastfeeding, include demands on a woman's time (work or childcare); the infant's season of birth, which modifies the mother's experience of social support and infant feeding practices; school holidays taking place during hot, dry months and placing more childcare responsibilities on breastfeeding mothers; and periods of higher prevalence of diarrhoeal disease, when women are less inclined to supplement breastfeeding for fear of giving infants contaminated water. In some settings, healthcare providers and relatives continue to advise water supplementation in hot weather or during the warm seasons.

Increased rates of exclusive breastfeeding could significantly improve infant survival in low- and middle-income countries. The authors conclude that, overall, there is evidence to support the WHO and UNICEF guidelines recommending that healthy infants should be fed exclusively with breastmilk, regardless of weather conditions. However, they still call for further research in countries bearing the brunt of climate change. Families and healthcare providers should be advised that exclusive breastfeeding is recommended even in hot conditions.

Exploring updates to the Lives Saved Tool for maternal and child nutrition outcomes

This is a summary of the following paper: *Tong H, Piwoz E, Ruel M et al (2022) Maternal and child nutrition in the Lives Saved Tool: Results of a recent update. Journal of Global Health, 12.*
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9801341/

The Lives Saved Tool (LiST) is a mathematical modelling tool that calculates changes in cause-specific mortality based on intervention coverage change, intervention effectiveness for that cause, and the percentage of cause-specific mortality sensitive to that intervention. LiST assumes that changes in coverage for health and nutrition interventions drive health outcomes. The model relies on determining base year coverage levels of an evidenced nutrition and health intervention, along with risk factors, health status and other pertinent factors for women and children in low- and middle-income countries. The countries are defined by the World Bank and data are compiled from a comprehensive list of high-quality data sources, with most evidence taken from systematic reviews.

LiST is useful as intervention effectiveness estimates focus on low-income countries, so findings are not extrapolated from high-income settings to those with more complex development profiles – a common issue in global health. The model is also reproducible and transparent, as inputs are collaboratively reviewed and modified as needed. LiST can also be applied across a broad array of settings, as activities and many inputs are user-defined.

The approach is limited in humanitarian settings, where data collection and routine monitoring, which LiST relies upon, are often limited. Protracted crises are also difficult to model, as such stable crises may not align with LiST assumptions. It is important to update the model by adding novel interventions when new evidence emerges on efficacy, as well as updating existing estimates for proven interventions. For nutrition modelling, the 'affected fraction' – the population benefiting from an intervention (defined as those with a nutrient deficiency or, as a proxy indicator, those residing in an area known to have poor dietary diversity or food insecurity)[1] – also requires regular attention to ensure model accuracy.

This study reviewed evidence from systematic reviews on 53 nutrition-related intervention-outcome (I-O) pairs for women and children under the age of five. An example of an intervention-outcome pairing is zinc supplementation in children under the age of five, which is paired with the outcomes of stunting, diarrhoea and pneumonia incidence. An external advisory group decided whether there was sufficient evidence of benefit for particular I-O pairs and how these could best be incorporated into LiST. Of the 53 pairs, 34 were incorporated into the updated model (an increase from 25 prior to review) and included 14 interventions (six for women of reproductive age and pregnant women, and eight for infants and children) and 16 nutrition, disease incidence and cause-specific mortality outcomes. The new set includes nine new I-O pairs, 13 existing links with updated efficacy and/or affected fractions, and 12 existing links with no changes to efficacy or affected fractions. The authors reaffirm the need for continuous updates to LiST in order for it to remain a useful tool for global health application.

[1] As many nutrition intervention trials do not screen for deficiency, it is assumed that most of the population ('affected fraction') will benefit from a given nutrition-sensitive intervention in areas with high poverty, poor dietary diversity or food insecurity. These socioeconomic measures are therefore often used in place of biomarkers, as they are more practical.

Small-Quantity Lipid-Based Nutrient Supplements for severe malnutrition

This is a summary of the following programming guidance: *UNICEF (2023) Small Supplements for the Prevention of Malnutrition in Early Childhood: Brief Guidance Note.*
https://www.unicef.org/documents/nutrition/SQLNS-Guidance

Recently, there has been a renewed focus on the use of Small-Quantity Lipid-Based Nutrient Supplements (SQ-LNS) (Box 1), due to the increasing body of evidence regarding their effectiveness and the inclusion of SQ-LNS in the Lancet 2021 series on Maternal and Child Undernutrition updated list of recommended interventions. In response, UNICEF have produced programming guidance to support the appropriate use of the intervention.

Evidence shows SQ-LNS can reduce the prevalence of stunting by 12% to 14%, severe stunting by 17% and the prevalence of severe wasting by around one-third in children aged 6–24 months, with greater effects observed in areas with greater burdens of wasting or stunting, or with poorer water quality or sanitation (Dewey et al, 2022). SQ-LNS can also lower the prevalence of micronutrient deficiencies (Wessells et al, 2021) and may support child development equivalent to one to five IQ points (Prado et al, 2021). Initial evidence supports the cost effectiveness of SQ-LNS (Adams et al, 2022).

UNICEF's guidance document highlights that SQ-LNS should be used as part of an integrated approach targeting younger child in contexts that are food-insecure and with high burdens of undernutrition (wasting, stunting and micronutrient deficiencies). The provision of SQ-LNS should be part of a larger effort to promote growth and improve the diets of infants and young children. A table of criteria and justifications is provided to guide decision-making around the use of SQ-LNS in any given context, and considerations for their integration within existing preventive interventions are outlined.

[1] https://www.thelancet.com/series/maternal-child-undernutrition-progress

Box 1 What are SQ-LNS?

Yet another acronym in the humanitarian lexicon, SQ-LNS are nutrition supplements incorporated into a small amount of food paste (around 20 g per sachet). SQ-LNS provide 24 micronutrients and macronutrients and are designed to be used as a form of home fortification, comparable in scope to multiple micronutrient powders. They can be mixed with complementary foods or eaten as they are straight from the sachet, as they do not need mixing with water. SQ-LNS have been shown to be highly acceptable to children and their caregivers, and high compliance rates have been observed. They are designed to be part of a toolkit to prevent undernutrition and micronutrient deficiencies in early childhood in contexts of significant nutrient gaps and where micronutrient deficiencies are common.

References

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An adolescent mother in Sierra Leone

Supplementary feeding and infection control in pregnant adolescents in Sierra Leone

This is a summary of the following paper: *Koroma A, Ellie M, Bangura K et al (2023) Supplementary feeding and infection control in pregnant adolescents – A secondary analysis of a randomised trial among malnourished women in Sierra Leone. Maternal & Child Nutrition, 19, e13456* **https://doi.org/10.1111/mcn.13456**

Undernutrition in pregnancy during adolescence carries a high risk of maternal morbidity and poor birth outcomes. This study performed a secondary data analysis to test the hypothesis that, during pregnancy, undernourished adolescents would benefit more than adults from an intervention consisting of a daily ration of supplementary food and anti-infective treatments.

The original randomised controlled trial was conducted in Sierra Leone and enrolled 236 younger adolescents (aged under 18 years), 454 older adolescents (aged 18–19 years) and 741 adults (aged 20 years or above), all with a mid-upper arm circumference of 23cm or more. Both control and intervention groups received treatment, albeit under different regimens. The intervention arm received antibiotic and antimalarial treatment at multiple stages of pregnancy, plus a daily ration of ready-to-use supplemental food throughout (18g protein and a broad range of micronutrients). The control arm received daily corn-soy blended flour, palm oil and a sharing ration in line with World Food Programme standards (17.5g protein), plus iron and folic acid during the second and third trimesters.

When evaluating outcomes, irrespective of the intervention group, younger adolescents had a similar rate of weight change compared to adult mothers. Younger adolescent mothers had newborns with lower birth weight, length and mid-upper arm circumference, as well as higher proportions of blow birth weight and stunted newborns compared to adult mothers.

Overall, while the intervention proved effective when all ages were pooled together, there were significant differences in effect between each maternal age group. These results were not as expected. Younger adolescent mothers benefited less from the combined intervention than adult mothers regarding the rate of weight gain during pregnancy and infant birth weight, length and rate of low birth weight. Younger adolescents also benefited less than older adolescents, although differences did not reach statistical significance.

The findings reinforce what has been seen in other studies: that younger adolescent mothers tend to give birth to babies with lower birth weight, length and mid-upper arm circumference than adult mothers. These findings do not, however, indicate that supplementary food is not beneficial when treating undernourished adolescents, as the analysis was not structured as supplementary food versus no supplementary food, so the results should be viewed with care.

There were limitations to the study. As a post hoc analysis (conducted after the dataset was already viewed), the incidence of multiple testing increased the chance of false positive results. Strengths included a large sample size and a robust design of the original trial. Further investigation is required to determine if the findings are comparable in different environments, as this was conducted in a rural West African context.

The findings may suggest that there are unaddressed barriers to nutrient transfer, improved length of gestation and/or other factors essential for foetal developmmes, especially in the most vulnerable young adolescents.

Fortified balanced energy protein supplementation for pregnant women in Burkina Faso

This is a summary of the following paper: *Hanley-Cook G, Toe LC, Tesfamariam K et al (2022) Fortified balanced energy-protein supplementation, maternal anemia, and gestational weight gain: A randomized controlled efficacy trial among pregnant women in rural Burkina Faso. The Journal of Nutrition, 152, 10, 2277-2286.* **https://doi.org/10.1093/jn/nxac171**

Anaemia and suboptimal gestational weight gain (GWG) are associated with adverse maternal and birth outcomes. Maternal GWG is a cumulative measure reflecting the altering physiology of the mother, specifically the changes in maternal and foetal weights across pregnancy.

This randomised controlled trial, which took place in rural Burkina Faso, enrolled pregnant women aged 15–40 at <21 weeks of gestation. The study assessed the efficacy of a micronutrient-fortified balanced energy protein (BEP) supplement on the outcomes of anaemia, GWG, and GWG rate in relation to the Institute of Medicine (IOM)'s recommendations (categorised into severely inadequate, inadequate and excessive GWG), compared against iron–folic acid supplementation.

Women in the intervention group received a daily fortified BEP supplement and an iron–folic acid tablet, whereas women in the control group only received the iron–folic acid tablet. The BEP supplement was a daily 72 g lipid-based nutrient supplement in the form of an energy-dense peanut paste fortified with multiple micronutrients. The BEP supplement provided 393 kcal/d and 22 mg/d of iron. All women received malaria prophylaxis at the relevant antenatal care visits. Haemoglobin (g/dL) concentrations were measured at baseline and at the third antenatal care visit, whereas maternal weight was measured at baseline and at all subsequent ~7-weekly antenatal care visits. Statistical analyses followed the intention-to-treat principle.

A total of 2,016 women were assessed for eligibility, of whom 1,897 were randomly assigned (960 control, 937 intervention) and 119 were excluded for not meeting the trial's inclusion criteria. Approximately 3% of both control and intervention arms were lost to follow-up at the third antenatal care visit. A further 22 control (2.42%) and 27 intervention arm mothers (3.07%) were lost to follow-up before delivery.

The results show that a combined daily BEP and iron–folic acid tablet had no effect on maternal Hb concentration, anaemia or prevalence of severe anaemia. In the combined BEP and iron–folic acid arm, maternal GWG was 6.27 kg, and the GWG rate was 0.274 kg/week, but both indicators showed no significant difference in comparison with the control arm. There were also no significant differences between study arms in terms of GWG adequacy, inadequate GWG, severely inadequate GWG or excess GWG prevalence. The main (null) findings were further confirmed by subsequent models that adjusted for various factors at baseline, as well as by the per-protocol analysis. Nonetheless, the full case analysis showed small but significant differences in absolute GWG and GWG adequacy.

In conclusion, the study showed that fortified BEP supplementation did not reduce maternal anaemia, nor did it increase GWG, in comparison with iron–folic acid. The authors suggest that future randomised interventions might assess whether preconception environments conducive to adequate GWG allow the mother to be more nutritionally replete, therefore channelling the additional nutrients from supplementation to support improved foetal growth and development.

A child has her mid-upper arm circumference (MUAC) measured in Dubuluk Health Centre, Ethiopia

How best to predict child mortality using different anthropometric indices?

This is a summary of the following article: *Briend A, Myatt M, Berkley JA et al (2023) Prognostic value of different anthropometric indices over different measurement intervals to predict mortality in 6–59-month-old children. Public Health Nutrition, 1–12. Advance online publication* **https://pubmed.ncbi.nlm.nih.gov/36722310/**

This pooled analysis of 12 prospective studies compared the prognostic value of mid-upper arm circumference (MUAC), weight-for-height Z-score (WHZ) and weight-for-age Z-score (WAZ) for predicting death in children aged 6–59 months. Sensitivity (the proportion of children below the threshold of case definition who died during follow-up) and false positive (children below the threshold of case definition who survived) ratios to predict death – within one, three and six months after the anthropometric measurement was made – were compared for the three individual anthropometric indices and their combinations. The analysis utilised community-based, prospective studies from 12 countries across Africa and Asia.

Sensitivity was higher for death within one month of follow-up as compared to follow-up at six months, by 49% for MUAC < 115 mm (P < 0.001), 48% for WHZ < -3 (P < 0.01) and 28% for WAZ < -3 (P < 0.005). This was accompanied by an increase in false positives of only 3% or less. Frequent anthropometric measurements therefore significantly improved the identification of malnourished children with a high risk of death without markedly increasing false positives.

Combining indices resulted in an increase in sensitivity, but also in false positives, among children meeting case definitions. The Venn diagram (Figure 1) shows the number of children who died within one month of assessment with at least one severe anthropometric deficit detected with WAZ < -3, WHZ < -3 and MUAC < 115 mm (a), and also with MUAC < 120 mm (b) and MUAC < 125 mm (c). WAZ < -3 was the most sensitive criterion, as it identified a total of 51 children among those with severe anthropometric deficits at assessment who subsequently died (n 170). MUAC < 115 mm identified 33 children, and WHZ < -3 identified 20.

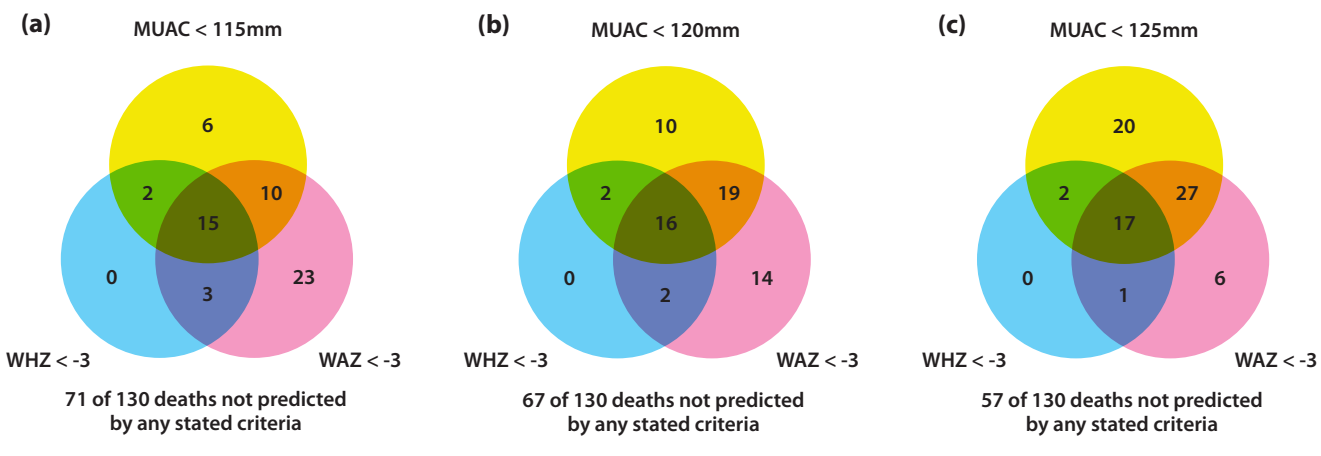
This study showed that, even when used frequently, the combination of MUAC < 115 mm and WHZ < -3 failed to identify quite a few children with WAZ < -3 who died during follow-up. Some children with WAZ < -3 who died during follow-up were also missed when the MUAC cut-off was increased to 120 mm, and even to 125 mm. No child who died during follow-up was identified by WHZ < -3 when MUAC < 115 mm or WAZ < -3 were used as the selection criterion. This suggests that the combination of WAZ < -3 and MUAC < 115 mm would eliminate the need for the use of WHZ.

Increasing MUAC cut-off as the sole criterion for admission – as is commonly the case with simplified protocols – increased the number of detected deaths, but also increased the proportions of false positives.

The authors also found that, for identifying high-risk children, there was a greater and more important overlap between the MUAC and WHZ indices than suggested by population surveys and analyses of programme data. Concerns about missing many high-risk children when using MUAC < 115 mm alone seem to be less relevant for monthly screening than for longer intervals between screenings.

In conclusion, the prognostic value of different anthropometric indices to predict death decreases over time. To optimise the detection of high-risk children, monthly screening is preferable where resources allow. Increasing the proportion of detected high-risk children who would die in the absence of treatment can also be achieved by using several indices simultaneously. The most sensitive scheme is MUAC combined with WAZ. The addition of WHZ does not capture any additional children with a high risk of death when compared to the combination of MUAC < 115 mm and WAZ < -3. However, combining MUAC and WAZ results in an increase in false positives – that is, of children who will survive in the absence of treatment – as compared with using MUAC only, with important implications in terms of the number of children treated and the consequent programme costs.

Figure 1 Venn diagram showing the overlap of children identified by different anthropometric indices among children who died within one month of nutritional assessment



COVID-19 adaptations to outpatient nutrition programmes in East Africa

This is a summary of the following paper: *Shragai T, Talley L, Summers A et al (2022) Outcomes after Acute Malnutrition Program Adaptations to COVID-19, Uganda, Ethiopia, and Somalia. Emerging Infectious Diseases, 28, 13.* **https://doi.org/10.3201/eid2813.212266**

After the onset of the COVID-19 pandemic, guidance for Community-Based Management of Acute Malnutrition (CMAM) was released to support the continuity of services while mitigating the risk of COVID-19 transmission. In response, countries adopted a variety of programme adaptations, including family mid-upper arm circumference (MUAC), longer intervals between clinic visits and MUAC-only programming. However, while experiences and lessons learnt have been documented in Field Exchange issue 64 (**Wrabel et al, 2021**), there remains a lack of data on the impact of implementing these adaptations at scale and as a part of routine programming.

The study reviewed here used routine CMAM programme data from Ethiopia (81 facilities), Somalia (12 facilities) and Uganda (five facilities) to evaluate changes in enrolment and treatment outcomes at facility level that corresponded with the implementation of COVID-19 programme adaptations (Table 1). In addition, eight facilities in Somalia provided child-level data for weight and MUAC at admission and discharge, and average length of stay (ALOS). The analysis adjusted for expected increases in enrolment due to seasonal periods of increased food insecurity and for expected decreases due to national COVID-19 mitigation measures, such as travel restrictions.

Table 1 Programme adaptations in Ethiopia, Somalia and Uganda

Country	Programme type	Dates data available date adaptations began	Programme adaptations
Uganda	Targeted supplementary feeding programme	Jan 2019–Dec 2020 Apr 2020	Family MUAC suspension of community screening reduced frequency of follow-up visits from weekly to every two weeks modified admission and discharge criteria from a MUAC threshold of 12.5 cm to 12.9 cm
Ethiopia	Outpatient therapeutic feeding programme	Jul 2019–Dec 2020 May 2020	Family MUAC suspension of community screening reduced frequency of follow-up visits from weekly to every two weeks
Somalia	Outpatient therapeutic feeding programme	Facility-level data: Nov 2019–Dec 2020 Mar 2020 Child-level data: Jan 2017–Nov 2020 Mar 2020	Family MUAC suspension of community screening reduced frequency of follow-up visits from weekly to every two weeks

The study found no statistically significant changes in total admissions, ALOS, total children screened for admission or recovery rates at facility level before and after adaptations. Although several facilities closed temporarily because of stock outages, these closures were short-term – upon reopening, admissions and the total number screened returned to pre-closure levels. MUAC and weight at discharge did not change meaningfully within the Somalia facilities that provided child-level data. However, the ALOS did significantly increase immediately after adaptations, but then decreased to pre-adaptation levels. The authors highlight four limitations to the study: its limited statistical power; challenges in isolating the effects of CMAM programme adaptations from other simultaneous COVID-19 mitigation efforts; the limited number of countries studied; and, finally, the fact that models do not capture the important qualitative experience of putting programme adaptations into practice.

Nevertheless, overall, the results provide initial evidence that adaptations to CMAM programmes did not significantly affect programme efficacy when adopted in the context of the COVID-19 pandemic. However, there is a need for further prospective studies with greater power to evaluate how the COVID-19 programme adaptations affected performance outcomes.

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Wrabel M, King S & Stobaugh H (2021) Adaptations to community-based acute malnutrition treatment during the COVID-19 pandemic. Field Exchange 64. **https://www.ennonline.net/fex/64/covid19cmamadaptations**

Building upon the Women's Empowerment in Agriculture Index

This is a summary of the following paper: *Heckert J, Martinez E, Seymour G et al (2022) Development and validation of a health and nutrition module for the project-level Women's Empowerment in Agriculture Index (pro-WEAI+HN). Maternal & Child Nutrition.* **https://onlinelibrary.wiley.com/doi/epdf/10.1111/mcn.13464**

Improving gender equality and empowering women – who make up 49.58% of the global population, and whose agency has been impeded throughout much of human development – is a central component of the Sustainable Development Goals. Agricultural development projects readily target women by incorporating gender-sensitive objectives to address the underlying drivers of malnutrition. Great strides have been made in quantifying women's empowerment within this field, as seen by the development of the Women's Empowerment in Agriculture Index (WEAI) and the Women's Empowerment in Livestock Index, to name a few. Yet there remains no standardised measure of women's empowerment focusing on nutritional outcomes that is also validated in multiple contexts. Without such data, it is not possible to determine how nutrition-sensitive agriculture programmes contribute to women's empowerment.

In this paper, the researchers have developed a health and nutrition 'module' (questionnaire) for the project-level WEAI (pro-WEAI+HN) to measure health-related and nutrition-related agency. The study used data from six projects across two distinct regions: Bangladesh and Burkina Faso/Mali (n = 12,114). The module was designed to be administered to women participants and considered all three pillars of the food, health and care paradigm (nutritious foods, healthcare utilisation and caregiving practices, alongside agricultural production); key life stages (infancy, early childhood, and pregnancy and lactation); and animal-source food consumption (women often face barriers to accessing these nutrient-dense and often culturally valuable foods due to entrenched societal norms). Although integral components of a diverse diet, fruits and vegetables were not considered in the module as women do not face the same barriers when accessing this food group compared to animal-source foods.

The results highlighted seven indicators, covering a woman's decision-making ability in the areas of her own health and diet; her health and diet during pregnancy; her child's diet; breastfeeding and weaning; purchasing food and health products; and acquiring food and health products. The analysis indicated that this module (pro-WEAI+HN) measures aspects of decision-making that are distinct from the previously used questionnaire (core pro-WEAI), highlighting the increased value provided by this expanded methodology. This led the authors to conclude that uptake of these indicators when studying nutrition-sensitive agricultural development projects may in turn strengthen the evidence on how these programmes can enhance women's empowerment. Such empowerment can then serve as a vehicle to improve health and nutrition outcomes for both women and their children.

A detailed breakdown of the methodology used by the researchers is beyond the scope of this summary (although this can be accessed via the link provided at the top of this review), although both the process and findings were robust, with a clear breakdown of study limitations included in the discussion. The findings can therefore be interpreted with a high degree of confidence.

Using childhood body composition to predict adult disease risk: A systematic review

This is a summary of the following paper: *Bander A, Murphy-Alford A, Owino V et al (2022) Childhood BMI and other measures of body composition as a predictor of cardiometabolic non-communicable diseases in adulthood: A systematic review. Public Health Nutrition, 26, 2, 323–350.* **https://pubmed.ncbi.nlm.nih.gov/36274635/**

Non-communicable diseases make up 71% of global deaths and are a huge financial burden for developed and developing countries alike. Childhood malnutrition has recently emerged as a possible risk factor for adult non-communicable disease risk, which could provide a useful marker for estimating the future burden of disease in a population. This systematic review of 29 studies investigated which measures of early life body composition could best predict non-communicable disease risk.

Due to heterogeneity among the included studies – where significant differences were observed in both protocol and outcomes, making it difficult to compare results – the review was presented as a narrative rather than as a quantitative summary. The studies featured a range of sample sizes (between 128 and 34,196 participants), which was a challenge for analysis, although all cohorts were representative of their target populations, which improved the validity of the findings. Most studies (n = 21) were from high-income countries, with five studies from India and only one study each from Guatemala and the Solomon Islands, making it difficult to extrapolate the findings to developing contexts as a whole.

The review featured a robust and systematic identification, screening and selection process, which considered an initial 5,764 studies. However, those included featured a mix of good, adequate and poor-quality studies when considering external and internal validity. It can be concluded that evidence on childhood body composition and later non-communicable disease is severely limited. No studies featured methods such as isotope dilution, plethysmography or dual-energy X-ray absorptiometry, which are more costly than basic anthropometric measures but have greater accuracy and precision. Body mass index (BMI) was the most common proxy measure of body composition used in the studies.

Most studies indicated that childhood BMI is associated with later-life cardiometabolic risk, but that changes in BMI rather than absolute BMI appear to be more important. Several studies showed that infant weight gain (catch-up growth to normal weight-for-age) is protective of non-communicable disease in later life and that low BMI at birth and in infancy are associated with an increased risk of non-communicable disease. Yet, high childhood BMI is also associated with an increased risk of non-communicable disease. The authors do articulate that BMI is a poor measure of adiposity, as it cannot differentiate between fat and fat free mass and is confounded by several factors in children, making it difficult to establish clear links. The lack of adjustment for current body size, which only featured in 11 studies, also impacts the interpretation of these results.

It should be noted that all studies controlled for known confounders to different degrees – which is important, given the broad range of confounding variables that could be present with this type of study – but the studies were observational in nature, which presents its own inherent limitations.

Ethical considerations for international research in low- and middle-income countries

This is a summary of the following paper: *Doherty T, Engebretsen IMS, Tylleskär T et al (2022) Questioning the ethics of international research on formula milk supplementation in low-income African countries. BMJ Global Health, 7, 5, e009181.* **https://gh.bmj.com/content/7/5/e009181**

There has been substantial growth in investment towards international research conducted in low- and middle-income countries (LMICs) by researchers or research sponsors from high-income countries. While ethical guidelines exist, examples of research with no benefit, and large potential for harm, still occur in LMICs.

Using the example of a formula milk supplementation trial in Uganda and Guinea-Bissau, this article presents key ethical considerations to be taken by institutional review boards, research funders, clinicians, scientists and governments when reviewing potential international research projects across LMICs. Such considerations are critical to ensure that research complies with international guidelines and recommendations, and provides scalable and sustainable strategies while protecting human rights.

Research studies must be justified and align with international public health recommendations, as well as with national guidelines in the country of implementation. In cases where research involves the modification of existing recommendations or guidelines, this decision must be adequately justified. In the case of the trial in Uganda and Guinea-Bissau, combining breastfeeding with formula milk supplementation for 30 days contradicted existing nutrition guidelines in both countries for the management of low birthweight infants, without justification.

Proposed interventions should be scalable within the study context, with demonstrated public health benefits and minimal risk of negative health and/or environmental impacts. Similarly, the principle of beneficence (i.e., doing no harm and acting in a patient or population's best interest) should guide the ethical review process, considering impacts throughout the study duration and beyond. This may involve considering how interventions maintain international and national guidelines and recommendations within and beyond implementation settings; how they influence health behaviours in the short and longer term; and how they align with contextual factors such as poverty, education, levels of infrastructure and access to resources. The formula milk supplementation trial violated these principles in several ways: the intervention modality itself (single-use, individually packed, premixed, hospital-distributed bottles) was not scalable within the study settings and presented risks to the establishment and continuation of breastfeeding, while contradicting the World Health Organization's Baby Friendly Hospital Initiative 10 steps to successful breastfeeding and having a negative impact on the environment. The authors suggest that we should instead focus on interventions that we already know work, including improving maternal nutrition; supporting and protecting early and exclusive breastfeeding and breastfeeding on demand; skin-to-skin contact; and continued lactation support.

Unlike the trial example, which seeks informed consent for formula milk supplementation from mothers within six hours of delivery, processes of gaining consent must be conducted under appropriate circumstances that allow potential participants the opportunity to make informed decisions on the risks and benefits of their involvement. They must also ensure that decision-making is not induced by perceived benefits of the intervention, or influenced by factors such as time pressures or existing vulnerabilities.

Finally, the role of the intervention being tested, and its long-term implications, must be considered – particularly when it undermines globally and/or nationally recommended interventions. Central to this is considering who benefits from the research and who bears its burdens.

The authors of this article call for those who review potential research projects in LMICs to exercise their responsibility to protect their citizens, in light of the ethical and human rights concerns that may be present.

A child playing with her mother in Kholowa Village, Zambia

The Lancet 2023 series on breastfeeding: Unveiling the predatory tactics of the formula milk industry

This is a summary of the 2023 Lancet Series on breastfeeding:
https://www.thelancet.com/series/Breastfeeding-2023

This series on breastfeeding draws special attention to the marketing that creates an artificial demand for commercial milk formula, and how it impacts families, healthcare providers, employers and politicians (The Lancet, 2023).

Breastfeeding has proven health benefits for both mothers and babies in high-income and low-income settings alike, yet less than 50% of babies worldwide are breastfed according to WHO recommendations. For decades, the commercial milk formula industry has used underhand marketing strategies designed to prey on parents' fears and concerns to turn the feeding of infants and young children into a multibillion-dollar business, generating huge benefits. The immense economic power accrued by commercial milk formula manufacturers is deployed politically to ensure the industry is under-regulated and that services supporting breastfeeding are under-resourced. These are the stark findings of this 2023 Lancet breastfeeding series.

The authors of this three-paper series outline the multifaceted and highly effective strategies used by commercial formula manufacturers to target parents, healthcare professionals and policy-makers. They describe how the industry's dubious marketing practices – which are in breach of WHO's International Code for the Marketing of Breastmilk Substitutes – are compounded by the lobbying of governments, often done covertly via trade associations and front groups, which act to erode breastfeeding protection laws and food standard regulations.

In the first paper of the series, Pérez-Escamilla et al (2013) describe how normal infant behaviours develop over the early months of their lives and how these influence feeding practices. They identify that common infant adaptations to the post-birth environment – including crying, unsettled behaviour and short night-time sleep durations – are often misconceived as signs of feeding problems, and that self-reported insufficient breastmilk continues to be one of the most common reasons for introducing commercial milk formula and stopping breastfeeding.

The second paper in this series (Rollins et al, 2023) addresses how the marketing of commercial milk formula operates. The authors document how the formula industry has reframed these normal behaviours to leverage parents' anxieties and aspirations in promoting their products. The marketing of commercial milk formula is a multifaceted, sophisticated, well-resourced and powerful system of influence that generates demand for, and sales of, its products at the expense of the health and rights of families, women and children. Digital platforms and the use of individual data for personalised and targeted marketing have substantially enhanced the reach and influence of this system. Manufacturers claim their products can alleviate discomfort or improve night-time sleep, and also infer that formula can enhance brain development and improve intelligence – all of which are unsubstantiated. Infant feeding is further commodified by cross-promotion of infant, follow-on, toddler and growing-up milks using the same branding and numbered progression, all of which aims to build brand loyalty and is a blatant attempt to circumvent legislation prohibiting the advertising of infant formula.

The political and economic forces that enable this commercial influence and undermine breastfeeding in the context of major gender inequities are presented in the third paper of this series (Baker et al, 2023). The authors present several structural drivers that contribute to the widespread inadequacy of breastfeeding promotion, protection and support within healthcare systems, such as gendered and biomedical power systems that undermine culturally appropriate and women-centred maternity care; ideological factors that accept and encourage corporate influence within health systems; and economic policies that constrain public budgets. The inadequacy of governments and economic systems in recognising the value of breastfeeding and care work (which is predominantly done by women), as well as insufficient investments in maternity protection, are also factors underpinning the growth of commercial milk formula markets. Half a billion women worldwide, most of whom are in underpaid, precarious or informal work, are denied adequate maternity protection.

The authors therefore argue that the marketing of commercial milk formula products should not be permitted. A framework convention, placing the rights of children and women at its heart, is needed to protect parents and communities from the commercial marketing of food products for (and to) children younger than three years old, including commercial milk formula marketing systems. The framework would restrict the marketing, but not the sale, of these products.

Overcoming structural barriers to breastfeeding requires determined and wide-ranging reforms that extend beyond the health sector. These reforms include actions aimed at social and political mobilisation and at curtailing corporate and financial power. Governments have an obligation to ensure their citizens have access to impartial information about feeding infants and young children, as well as to enact policies that are free from commercial influence. The full and equitable support for women and children's rights at home, at work, in public spaces and in healthcare is a societal responsibility.

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Human milk banking: Attitudes and practices in rural Türkiye

This is a summary of the following article: *Akpinar C, Mandiracioglu A, Ozvurmaz S et al (2022) Attitudes towards human milk banking among native Turkish and refugee women residing in a rural region of Turkey: A mixed-methods approach. International Breastfeeding Journal, 17, 74.* **https://internationalbreastfeedingjournal.biomedcentral.com/articles/10.1186/s13006-022-00516-2**

Breastmilk is the ideal food for infants, providing all the energy and nutrients required for the first six months of life and providing up to half of a child's nutritional needs through to two years of age. To encourage a supportive breastfeeding environment, particularly in areas where breastfeeding practices are low and/or compromised, human milk banks offer an essential service.

Human milk banks are facilities that collect breastmilk donations from mothers who produce more than their babies need, and which pasteurise and appropriately store this donor milk for future use. When breastfeeding is not possible, the World Health Organization recommends the use of donated breastmilk as the best feeding option.[1]

Despite the need, there is currently no human milk bank in Türkiye. To determine the acceptability of establishing such facilities, this cross-sectional study investigated the opinions and attitudes surrounding donor milk banks in rural Türkiye. Qualitative data were collected via comprehensive interviews with 33 women and then thematically analysed. Quantitative data were obtained from a questionnaire issued to 271 women, and a logistical regression was performed to analyse this aspect. All participating women were over 18 years of age and had given birth within the last five years.

It is important to consider the context of this study, which was completed in a rural area with significant internal and external migration, featuring a diverse array of refugee (often from Syria, but also Iraq and Afghanistan) and migrant (often from the Balkans) groups in addition to Turkish nationals. Purposive sampling – where participants are selected based on their study characteristics, rather than at random – was used, resulting in 15 of 33 women in the qualitative study being refugees. Although this methodology is appropriate for investigating the opinions of a diverse group, as it allows inferences to be made for a broader range of people, it is not representative of the population in this region of Türkiye or of the country as a whole. The sample was also relatively small, so the findings should act as a guide to the opinions of the study population rather than indicating the acceptability of human milk banks across Türkiye.

Just over half of the women in the study (57.9%) were willing to donate breastmilk, yet only 27.7% were willing to use donor milk for their babies. Religious beliefs, alongside fear of infectious disease and distrust of donors, were cited as major barriers to donor milk use by both native Turkish women and refugees, with human milk banking remaining a contentious issue among religious groups in the country (Ozdemir et al, 2015). The odds of having a positive attitude towards donor milk banks was four times higher in homemaker (non-working) women, almost five times higher in women with three or more children and six times higher in women with a positive attitude towards wet-nursing. Religious factors played a positive, as well as a negative, role in attitudes.

These barriers and facilitators are important to consider when implementing human milk banks in this region, or in regions with comparable cultural and/or religious practices.

[1] https://www.who.int/news-room/articles-detail/call-for-proposals-support-for-the-development-of-who-guidelines-on-donor-human-milk-banking

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Integrating maternal nutrition into antenatal care services in African and Asian contexts

This is a summary of the following paper: *Sanghvi T, Nguyen PH, Ghosh S et al (2022) Process of developing models of maternal nutrition interventions integrated into antenatal care services in Bangladesh, Burkina Faso, Ethiopia and India. Maternal & Child Nutrition, 18, 4, e13379.* **https://onlinelibrary.wiley.com/doi/full/10.1111/mcn.13379**

Antenatal care (ANC) remains a widely used and vital service for pregnant women, and one that also provides a window of opportunity to deliver a package of nutrition interventions. This is not only pertinent for women themselves, but also reflects the importance of maternal nutrition in dictating the health and development trajectory of their children. The integration and, more importantly, scale-up of such nutrition services into ANC across multiple contexts is therefore a global health priority.

For the paper reviewed in this summary, the authors worked in four diverse countries (Bangladesh, Burkina Faso, Ethiopia and India) to develop and subsequently implement a package of globally recommended maternal nutrition interventions[1] through existing ANC programmes. At the outset, an overarching Theory of Change that illustrates the country's programme needs was developed to describe common barriers and strategies, expected outcomes and health and nutrition impacts. Importantly, current global recommendations were implemented for each aspect of the package protocols, and steps were taken to reinforce the systems across multiple domains. A detailed breakdown of these aspects is beyond the scope of this summary, but the collective strengthening and updating of this suite of interventions occurred between 2014 and 2021. The findings provide models of how to integrate and enhance the package of interventions through existing ANC programmes in each of the four countries.

It is important to note that the Bangladesh and India elements of this intervention were incorporated prior to the outbreak of COVID-19, but that the Burkina Faso and Ethiopia elements were affected by the pandemic. Although adaptions were made to maintain service delivery in these two countries, it is reasonable to assume that the pandemic exerted a detrimental effect on these arms of the study, which should be considered when interpreting these findings. As the researchers integrated this package of interventions into existing, large-scale ANC programmes, the paper focuses on scalability through system-wide improvements, rather than at the health facility and community level.

Another challenge when interpreting these findings is the sheer size of the experiences captured – seven years of lessons learnt obtained across diverse settings, each with particular health needs and differing gaps in existing services – so distilling these findings into a summary is a challenge. The findings of this paper provide rich operational insights for those in other contexts to reduce missed opportunities for integrating maternal nutrition into ANC and nutrition into health services more broadly. The authors highlight the importance of combined facility-based and community-based approaches to improve service provision and adoption. Setting aside appropriate windows for field implementation and adjustment is also important when applying global guidelines to national health services, as each setting is likely to present unique challenges. Despite the differences, the authors noted common actions that proved effective in each context, which can crudely be grouped into improved training (of staff), outreach (in communities) and strengthening (of data collection).

[1] Interventions included as part of the package included micronutrient supplementation (iron-folic acid and calcium distribution and counselling), weight gain monitoring (measurement and counselling), dietary counselling (meal frequency, food amounts and dietary diversity) and breastfeeding counselling (early initiation and exclusive breastfeeding).

Effectiveness of a simplified protocol in Mali: An observational study

This is a summary of the following paper: *Kangas S, Marron B, Tausanovitch Z et al (2022) Effectiveness of acute malnutrition treatment at health center and community levels with a simplified, combined protocol in Mali: An observational study. Nutrients, 14, 22.*
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9699530/pdf/nutrients-14-04923.pdf

The evidence base that simplified treatment protocols for severe wasting can be more cost-effective, as well as non-inferior, to standard treatment pathways has been growing in recent years. Several protocols have been trialled, such as the simplified dosage of ready-to-use therapeutic food (RUTF), tapered dosage regimens as a child progresses along a treatment pathway and the simplification of admission protocols. This observational cohort study, piloted in 35 health areas in rural Mali, describes the response to simplified, combined treatment among 27,800 children aged 6–59 months with acute malnutrition. The inclusion criteria were a mid-upper arm circumference (MUAC) of <125 mm and/or oedema, in line with other studies. The treatment protocol was based on the Combined Protocol for Acute Malnutrition Study (ComPAS)[1], whereby children with a MUAC of <115 mm and/or oedema were prescribed two sachets of RUTF and children with a MUAC of 115 mm ≤ or a MUAC of <125 mm were prescribed one sachet. Antibiotics were delivered at admission and deworming, malaria, diarrhoea and acute respiratory infections were treated in line with national protocols, as needed. A discharge ration of seven RUTF sachets was given to children upon recovery.

Recovery was defined as a MUAC of ≥125 mm and no oedema over two consecutive visits. Most children (80%) were treated at a health centre, and 20% were treated at community health sites. This low proportion of community admissions was attributed to the recent scale-up of the community health worker component.

In total, 92% of the study population recovered, with a mean length of stay of 40 days and a mean RUTF consumption of 62 sachets per child treated. Among the more severely malnourished children (a MUAC of <115 mm and/or oedema), 87% recovered with a mean length of stay of 55 days and a mean RUTF consumption of 96 sachets. Recovery did not differ significantly between health facility (92%) or community-level treatment (94%), highlighting the quality of community health worker-led treatment in this Sahelian context. All programmatic indicators exceed the SPHERE[2] standards.

This is the first paper to report the use of this simplified, combined protocol outside of health facilities, and the results are encouraging. The protocol proved easy to implement by non-formally trained care providers.

It is important to note that mean MUAC was slightly higher for children admitted to community-level care (116.5 mm) compared to those treated in the health centre (115.2 mm), which may have biased the results in favour of community care – children with better anthropometric status are more likely to recover sooner. However, this difference was small, so any confounding is likely to be minimal. This may indicate that caregivers seek treatment sooner when it is closer to the home, which is a positive finding in itself – previous studies indicate that treating children earlier in the disease pathway is correlated with better outcomes. The training of community health workers to provide treatment was shown to reduce the distance to treatment for 21% of the catchment population, yet 20% still had to travel over 15 km for treatment. Accessibility therefore remains both a concern and a target for intervention.

In conclusion, this study shows that the simplified, combined protocol resulted in a high recovery rate and low RUTF consumption per child, and can be effectively delivered through community health workers.

[1] https://trialsjournal.biomedcentral.com/articles/10.1186/s13063-018-2643-2
[2] https://spherestandards.org/handbook-2018/

Relaxation interventions for maternal and neonatal outcomes: A systematic review

This is a summary of the following paper: *Abera M, Hanlon C, Daniel B et al (2022) Effect of relaxation interventions in pregnant women on maternal and neonatal outcomes: A systematic review and meta-analysis [preprint].*
https://www.medrxiv.org/content/10.1101/2022.11.17.22282468v1

Maternal stress and disturbances to mental wellbeing are common occurrences during the perinatal period, with 15% to 25% of women experiencing high levels of anxiety or depressive symptoms during pregnancy. Maternal stress is associated with adverse pregnancy and birth outcomes yet, despite various interventions targeting different aetiologies, there has been no comprehensive review to synthesise evidence on the effectiveness of relaxation interventions[1] on maternal and neonatal outcomes.

This systematic review considered five databases, following the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) guidelines. Case reports, cross-sectional studies and editorial and/or opinion pieces were excluded. Eligible studies were randomised controlled trials or quasi-experimental studies on healthy pregnant women without additional pregnancy complications, which reported on the outcomes of interest specified in the search strategy – stress (self-reported, physiological and/or biochemical) or mental health/anxiety symptoms – and/or pregnancy outcomes. Unpublished work and grey literature were excluded, but a manual search was also completed to find additional studies from the reference lists of those identified.

A meta-analysis was conducted to obtain pooled estimates of effect (mean difference and standard deviation) for maternal depressive symptoms, maternal stress symptoms and birth weight. Where meta-analysis was not possible, where there was a small sample size for certain outcomes, a narrative synthesis was performed and reported.

Of the 19 studies that were included for systematic review, three were from India, with the remainder being from upper-middle-income or high-income countries. This made it difficult to extrapolate these findings to lower-income contexts, especially Africa, as no studies featured that continent. Most studies were deemed to have a low risk of selection bias, although it was unclear to what degree reporting bias affected these outcomes.

In general, relaxation interventions were found to be effective in reducing perceived stress and depressive symptoms during pregnancy. Mindfulness-based childbirth and parenting (a form of cognitive behavioural therapy), music therapy, progressive muscle relaxation, meditation, yoga and hypnosis were effective in reducing, to varying degrees, maternal depressive, stress and anxiety symptoms during pregnancy. There are several plausible biological mechanisms by which these interventions can promote maternal homeostasis and subsequent infant growth and development, but disentangling the direct and indirect effects of each is challenging.

The authors note that findings on obstetric and birth outcomes were inconclusive, but the initial evidence is promising. The meta-analysis may have been underpowered due to small sample sizes in trials, highlighting the need for further evidence generation to form more robust conclusions. Relaxation interventions are low-intensity, highly scalable in resource-poor settings and broadly without risk, indicating that this approach merits further research.

[1] In this study, relaxation interventions were defined as any form of relaxation intervention, whether mind-based (tapes or music) or physical-based (massage, stretch or exercise), which were applied with the aim of promoting relaxation and reducing stress.

Preconception and periconception interventions to prevent adverse birth outcomes

This is a summary of the following paper: *Partap U, Chowdhury R, Taneja S et al (2022) Preconception and periconception interventions to prevent low birth weight, small for gestational age and preterm birth: A systematic review and meta-analysis. BMJ Global Health, 7, e007537.* **https://pubmed.ncbi.nlm.nih.gov/35948345/**

A growing body of evidence supports the potential benefits of interventions delivered prior to conception regarding the risk of adverse birth outcomes, including low birth weight (LBW), small for gestational age (SGA) deliveries and preterm birth (PTB). However, a better understanding is needed of the effects of such interventions to identify knowledge gaps and inform future prevention strategies.

This article presents findings from a systematic review and meta-analysis examining the impact of interventions delivered during the pre- and periconception (until pregnancy is detected) periods, or from preconception throughout pregnancy, on LBW, SGA and PTB. Of the 58 identified studies, most examined health and nutrition interventions, with little research being carried out on other relevant areas such as environmental health and social interventions. There were also few studies available for any single comparison, limiting the authors' ability to draw conclusions on whether specific interventions – such as food supplementation during preconception and pregnancy versus during pregnancy only – reduce the risk of individual outcomes.

Findings suggested that only health interventions aiming to reduce early adverse pregnancy outcomes were associated with reduced risk of SGA and PTB among women with previous miscarriage. No clear impact on any primary outcome was shown for preconception and periconception nutrition interventions, including multiple micronutrient supplementation, folic acid supplementation with or without iron and food supplementation. Proposed reasons for the uncertainty of evidence included (1) insufficient evidence from a limited number of studies to meaningfully assess impact; (2) relatively short durations (three to six months) of supplementation prior to conception; (3) poor levels of adherence to interventions; and (4) inadequacy of the intervention provided. In low- and middle-income countries (LMICs), where most interventions were implemented, micronutrient or food supplementation delivered in the preconception period may be insufficient to improve pregnancy outcomes, particularly in contexts where the burden of undernutrition remains high among women of reproductive age.

The review highlights the beneficial effects of preconception nutritional supplementation (iron and folic acid or food supplementation) on maternal anaemia during the second and third trimesters, although this was not related to primary outcomes. Provision of preconception and periconception nutritional supplementation containing folic acid was also associated with a reduced risk of birth defects (primarily neural tube defects). Since antenatal care attendance often occurs late during pregnancy in LMICs, these findings suggest potential opportunities to improve maternal micronutrient and anaemic status by extending micronutrient supplementation interventions to the preconception period.

Overall, this review highlights the dearth of relevant high-quality evidence and the need for further well-designed studies on the effectiveness of preconception nutrition, health, environmental and social interventions in preventing adverse outcomes, including LBW, SGA and PTB. The authors suggest that future research should prioritise integrated, multicomponent interventions that address different determinants of preconception health, including women's education, empowerment and equity to infrastructure, as well as water supply and sanitation. Attention should also be given to intervention timing and duration and other underlying characteristics that may affect overall impact, such as preconception nutritional status or geographic region.

Highlighting two upcoming study protocols on severe acute malnutrition in sub-Saharan Africa

This is a summary of the following papers: *King S, D'Mello-Guyett L, Yakowenko E et al (2022) A multi-country, prospective cohort study to measure rate and risk of relapse among children recovered from severe acute malnutrition in Mali, Somalia, and South Sudan: A study protocol. BMC Nutrition, 8, 90.* **https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9404649/pdf/40795_2022_Article_576.pdf**

Puett C, King S & Stobaugh H (2022) A multi-country, prospective cohort study to evaluate the economic implications of relapse among children recovered from severe acute malnutrition: A study protocol. BMC Nutrition, 8, 139. **https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9701364/pdf/40795_2022_Article_631.pdf**

Community-Based Management of Acute Malnutrition (CMAM) – where caregivers provide treatment for the majority of children with uncomplicated severe acute malnutrition (or 'wasting') at home – has proven to be an effective and efficient model when compared to traditional inpatient treatment, and also prevents child mortality. However, evidence is growing that recovery may not be sustained after discharge from such programmes (i.e., children are relapsing). Such relapses are costly, both for the children in question and when considering the financial implications of delivering CMAM at scale.

The first study reviewed by this article (King et al, 2022) is a prospective cohort study following children (n > 1,800) aged 6–59 months who have achieved anthropometric recovery following treatment from wasting in Mali, Somalia and South Sudan. Children were matched to community controls (n > 1,100) who were not previously wasted. Individual-, household- and community-level information is planned to be analysed to understand the burden of, and identify risk factors for, relapse, with a specific focus on water, sanitation and hygiene-related exposures. The study will conduct a comprehensive microbiological assessment of participants' drinking water, food, enteric infections, immune function and antibiotic resistance, with the aim of identifying risk factors for different post-treatment outcomes. All data collection is due to be completed by January 2023, prior to analysis.

The second study (Puett et al, 2022) focuses on the same CMAM programmes in Mali, Somalia and South Sudan, but is a sub-study to assess the economic implications of relapse. Cost data will be collected from each programme, covering the four main components of the standard CMAM model (Box 1). The aim of this sub-study is to calculate unit costs for different CMAM service components, and then to conduct a cost-efficiency analysis using these unit costs to assess the financial burden of re-treating children who have relapsed. The researchers state that this study will provide the first estimates to address the limited evidence on the economic implications of wasting relapse in CMAM programmes.

Both studies are being implemented in three countries, each with concurrent and reoccurring humanitarian crises and associated high wasting prevalence. Despite these similarities, these studies will allow the researchers to compare locations with a variety of climates, livelihoods, cultures and political settings, permitting the results to more accurately be extrapolated to other contexts where appropriate.

Box 1 The four main cost components of a CMAM programme

1. Inpatient treatment for wasted children with medical complications (stabilisation centres)
2. Outpatient treatment for severely wasted children without medical complications (outpatient therapeutic programmes)
3. Outpatient care for moderately wasted children (supplementary feeding programmes)
4. Community outreach services (active case finding and screening, community mobilisation and sensitisation activities)

Affordable and nutritious child feeding in Nigeria: Applying Cost of the Diet modelling


Conducting a market survey in Oyo state. Nigeria, 2022


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KEY MESSAGES

- This article explores a 'Cost of the Diet (CotD)' assessment, conducted in Nigeria in 2022, which identified the cheapest approaches to meet all the nutritional requirements of children aged 6–23 months throughout the year, from locally available and culturally acceptable food items.
- Markets had a diverse range of food items that could fulfil all major macro- and micronutrient requirements, indicating that the availability of nutrient-rich foods may not be the main barrier to a nutritious diet in this setting.
- The CotD assessment showed that a lowest-cost diet meeting energy, protein, fat and micronutrient specifications is expensive compared to the standard income of the target population.

Background

Due to the high prevalence of undernutrition, in 2019 the Government of Nigeria and the World Bank identified Oyo state in Southwestern Nigeria as one of the 12 highest-burden states in the country. Around 35% of children under five are stunted and 65% are anaemic. Six out of ten children do not receive a diverse diet, and nearly nine out of ten are not fed an appropriate number of meals for their age. Only 5.8% of children achieve a minimum acceptable diet (National Population Commission, 2019).

The Accelerating Nutrition Results in Nigeria (ANRiN) project is a GBP 202 million initiative of the Federal Government of Nigeria – financed by the International Development Association of the World Bank Group and the Global Financing Facility – to tackle malnutrition in the 12 highest-burden states in Nigeria. The project aims to improve maternal and child nutrition status by increasing access to, and utilisation of, Nigeria's Basic Package of Nutrition Services. The package includes the promotion of infant and young child feeding practices through social and behaviour change communication activities. However, evidence suggests that economic constraints can limit the effectiveness and sustainability of such initiatives if nutritious foods are unavailable or too costly (Deptford et al, 2017). In addition, current complementary feeding recipes promoting dietary diversity tend to be generic and based on food groups rather than on actual nutritional content, cost and local food availability, as well as dietary preferences.

Study objectives

The CotD assessment in Oyo was conducted in 2022 to identify the cheapest approaches to meet all the nutritional requirements of children aged 6–23 months throughout the year, from locally available and culturally acceptable food items. Recipes would then be promoted through existing Mother Support Groups alongside Nigeria's Basic Package of Nutrition Services.

The analysis also aimed to assess the degree to which economic constraints might affect poor and very poor households from accessing a nutritious diet. Specifically, this assessment set out to answer the following questions:

- What is the minimum cost of a nutritionally adequate and culturally acceptable diet for a typical household in Ogo Oluwa and Afijio local government areas (LGAs) of Oyo state?
- What locally available foods are inexpensive sources of essential nutrients and can be promoted through programme interventions?

Methods

A CotD analysis estimates the hypothetical minimum amount of money a typical household would need to purchase their recommended intakes of energy, protein, fat and micronutrients, using locally available foods. The software contains five databases: the energy and nutrient content of foods; the energy and nutrient requirements of individuals; predefined groups of individuals in typical households; the portion sizes of foods; and currency conversion factors (Deptford et al, 2017).

Primary data on food prices, seasonal food price variation, seasonal availability and local dietary habits were entered into a linear programming solver within the software. The CotD

Conducting a market survey in Oyo state, Nigeria, 2022

software, in combination with the internal databases, then estimated the cost, quantity and combination of local foods needed to provide target individuals and households with a diet that met average energy needs and recommended intakes of protein, fat and micronutrients. For this assessment, an average household size (n = 5) was calculated from ANRiN's monitoring data.

Primary data collection for the CotD assessment involved surveys in selected markets and individual interviews and focus group discussions (FGDs) with neighbouring villages or communities. Primary data collection took place during January and February 2022 in Ogo Oluwa and Afijio LGAs within Oyo state, where Save the Children was already planning to implement the ANRiN Innovation project. In total, 10 markets and 10 villages (farming communities) were selected for primary data collection from a complete list of villages, with one additional market and one village selected for field practice. All 10 villages were within the catchment areas of the markets where market surveys were conducted.[1]

a) **Market survey:** The primary aim of the market survey was to record the prices and weights of food items found in the assessment area across various seasons. Real-time data on food prices were collected for the current season (dry season, lasting from November to March), while retrospective data were collected for the other two seasons (rainy season, lasting from August to October; lean season, lasting from April to July). Where possible, weight and price data were collected from four traders in each market.
b) **Individual interviews:** A food frequency questionnaire was administered to assess the consumption frequency (per week) of all food items on the market survey questionnaire, if available or in season. In each sample village, eight women (with children under two years of age, and who were also the primary food preparer in the household) were asked to participate in both individual interviews. In total, 80 individual interviews were conducted from 10 villages.
c) **FGDs:** The FGDs were conducted with the same groups of women who had taken part in the interviews using a semi-structured questionnaire to obtain insights into typical food consumption habits, cultural practices and food taboos in the assessment area. The discussions validated the interviews' compiled responses, covering food preferences, taboos, beliefs, intra-household food distribution and access to markets, and homegrown/naturally available free food items.

Estimating different diets and their cost

The research team estimated the cost of four hypothetical diets using the above data and the CotD software for a typical five-person household (comprising one man, one breastfeeding mother, and three children, including one child aged 12–23 months):

a) A lowest-cost diet that only met recommended average energy requirements (energy only (EO) diet)
b) A lowest-cost diet that met specifications for energy, protein, fat and micronutrients but did not consider typical dietary habits (minimum-cost nutritious (NUT) diet)
c) A nutritious diet calculated by applying constraints at the time of analysis to include the staple foods and exclude taboo foods (staple-adjusted nutritious (SNUT) diet)
d) A lowest-cost diet that met specifications for energy, protein, fat and micronutrients and considered typical dietary habits and cultural acceptability (food habit nutritious (FHAB) diet)

Estimating the affordability of diets

While the minimum cost of a nutritious diet can be useful on its own, more insight is gained when comparing diet costs against the purchasing power of the target population. Diet affordability was estimated using income and expenditure data from a recent economic assessment in a neighbouring LGA to Oyo state (Okeleke et al, 2020). Annual non-food expenditure was taken as it was reported. For each wealth group (poor and affluent households), income and non-food expenditure data were entered into the CotD software to determine how affordable the diet was.

Limitations of the CotD software and method

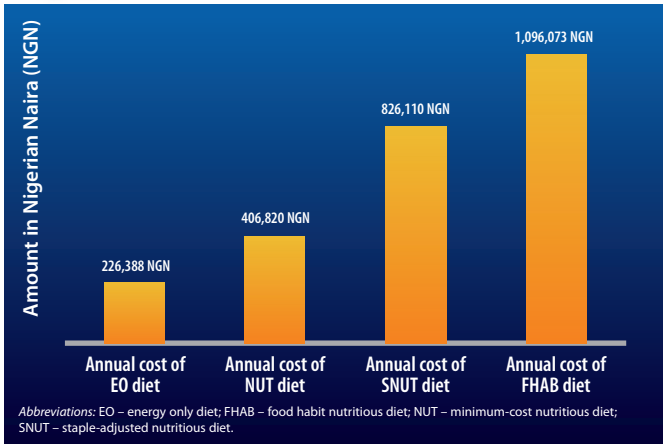
While the CotD method and software are practical, powerful tools, it is important to consider the limitations of the analytical process and associated results.

- The software estimated diet is the hypothetical lowest-cost diet, which is applicable only for the family size (n = 5) and composition used in the calculation. Therefore, any results that extrapolate these findings to specific groups or individuals should be interpreted with caution.
- The method also excludes any additional energy, protein and nutrient requirements for sick or convalescing individuals due to insufficient data, highlighting the need for further caution.
- Although CotD software can identify a 'diet' that provides the recommended amounts of macro- and micronutrients from a relatively small sample of foods, it assumes that this particular diet will be consumed by each family member on a daily basis and at every meal, which is unlikely to be realistic.
- The CotD software also fails to consider the needs for several nutrients, including vitamin D, iodine, and essential amino and fatty acids. However, there is a rationale for excluding these nutrients: vitamin D is not included as requirements can be met when skin is exposed to ultra-violet light; iodine is not included as the amount present in foods is dependent on soil quality; and most food tables do not provide data on essential amino or fatty acids.
- When interpreting CotD results, it is also critical to consider intra-household food distribution. The software determines the amount of food for a family based on the sum of recommended nutrient intakes, but food is often distributed within a house-hold based on individual needs – and not always equitably (Berti, 2012; Harris-Fry et al, 2017).

[1] A map of the study locations can be accessed here: https://www.google.com/maps/d/u/0/edit?mid=1uPLHF CoNSJHxm9nFxmj4l6VaTLciOuuM&ll=8.107971704197 201%2C4.032347523828 11&z=10

[2] Children under the age of six months were not the primary targets for this study, although this group were often mentioned during FGDs regarding child feeding practices. For the purposes of this analysis, all children under the age of six months were assumed to be exclusively breastfed.

Figure 1 The annual cost of various diet types for a standard household with five members



Abbreviations: EO – energy only diet; FHAB – food habit nutritious diet; NUT – minimum-cost nutritious diet; SNUT – staple-adjusted nutritious diet.

Table 1 Estimated affordability of different diet types and non-food expenditure by household types (poor vs affluent)

	Formula	Poor households	Affluent households
Annual household income	-	664,222	1,651,200
Non-food expenditure	-	313,612	313,612
Income: non-food expenditure	(a)	350,61	1,337,588
Cost of EO diet	(b)	226,004	226,004
Excess or shortfall	(a) – (b)	124,606	1,111,584
Cost of NUT diet	(c)	404,381	404,381
Excess or shortfall	(a) – (c)	-53,771	933,207
Cost of SNUT diet	(d)	826,11	826,11
Excess or shortfall	(a) – (d)	-475,5	511,478
Cost of FHAB diet	(e)	1,096,073	1,096,073
Excess or shortfall	(a) – (e)	-745,463	241,515

Key findings

Food availability and consumption patterns

The market survey found 182 food items in the assessment area when combining all three seasons: 33 cereal or grain-based products; 15 types of root and tuber; 18 types of legume, nut and seed; 9 meat and offal products; 17 types of fish or seafood; 24 vegetables; and 25 fruits/fruit products.

The interviews and FGDs conducted in the 10 villages confirmed that yam, cassava and maize were the main staple foods. Although rice and wheat (mainly used to make bread) were also commonly consumed and available in the market, they were comparatively more expensive and thus less frequently consumed than the alternatives. Most households consumed two to three meals a day on average throughout the year, with some impoverished households having only one or two meals a day. However, there were some differences between the seasons: three meals were usually consumed during dry seasons, whereas only two meals were consumed during rainy or lean periods.

The most common food for children under the age of two was 'pap', a soft, watery food prepared from maize mixed with sugar and milk or water. There were no specific taboos observed for this age group. Breastmilk was given to children under the age of two, but exclusive breastfeeding was not often practised.[2] Alongside breastmilk, common foods for children were ewedu (a savoury soup made of leafy vegetables, most commonly of jute leaves), mashed beans, noodles and cassava flour. Fish, milk and eggs were rarely given to children due to the prohibitive cost.

The study found that the lowest cost of meeting just the EO requirement of a typical five-member household was NGN 226,388 (USD 500) per year (Figure 1). The annual cost of a diet that met the needs for energy and micronutrients but did not consider typical dietary practices (the NUT diet) was NGN 406,820 (USD 900). The annual cost of the SNUT and FHAB diets was around NGN 826,110 (USD 1,830) and NGN 1,096,073 (USD 2,430) respectively. Within the household, the cost of meeting the nutritional requirements of breastfeeding women was highest (27% of household spend), followed by the requirements of men (25%), of children aged 11–12 (24%), of children aged 9–10 (19%) and of children aged 12–23 months (5%).

The FHAB diet included 43 food items from 12 different food groups available in the markets. Yam (tuber or flour) was identified as the primary staple that constituted 26% of overall cost, meeting 28% and 16% of energy and protein requirements respectively, along with other micronutrient needs. Overall, markets in the study area had a diverse range of food items that could fulfil all major macro- and micronutrient requirements. While this analysis did not identify any limiting nutrients in the assessment zone, calcium and iron were found to be the most difficult to obtain (i.e., the most significant cost driver), followed by pantothenic acid (B5) and vitamin B12.

The results from the affordability analysis (Table 1) indicate that poor rural households from farming communities may be unable to afford a FHAB diet plus non-food expenditure. This implies that poor households can only afford to purchase a portion of FHAB after meeting their non-food expenditure. As per the affordability calculation, poor households can only afford to meet energy requirements and non-food expenditure with their current income level. Therefore, poor rural households have a shortfall of NGN 53,771 (USD 120), NGN 475,500 (USD 1,055) and NGN 745,463 (USD 1,650) from being able to afford a NUT, SNUT and FHAB diet respectively. Conversely, wealthier households with an income in line with the national annual minimum wage (NGN 1,651,200 (USD 3,660)) can afford both the FHAB diet and non-food expenditure, with a predicted surplus of NGN 241,515 (USD 535).

Nutritious diet 'what if' modelling

Using CotD software, three hypothetical 'what if' scenarios were modelled to examine the effects on the cost, composition, quality and affordability of the diet of poor households:

1. Introducing moringa leaves (i.e., drumstick leaves) for one of three meals a day, only

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Conducting a Focus Group Discussion with farming community members in Oyo state. Nigeria, 2022

during the dry season, as a free food (Model 1)
2. Promoting the consumption of sweet potatoes once a week, during all seasons, as an alternative to the other commonly consumed roots/tubers (Model 2)
3. Introducing both interventions together (Model 3)

Moringa leaves are abundant in communities, as shown by around half of the interviewed mothers reporting their consumption, yet they are only consumed sporadically. It can therefore be leveraged as a more consistent and cheaper source of nutrients. If moringa leaves were consumed more frequently (Model 1), the annual cost of the FHAB diet for the entire family would be reduced from NGN 1,096,073 (USD 2,430) to NGN 880,801 (USD 1,950) – a 20% reduction. On an individual level, the cost of a nutritious diet for breastfeeding mothers could be reduced by 17%. For children under the age of two, the reduction could be up to 36% (Figure 2).

Similarly, if poor households replaced a portion of yam flour and grated cassava (garri) in their diet with sweet potatoes (Model 2), the annual cost of the FHAB diet for the entire family would be reduced from NGN 1,096,073 (USD 2,430) to NGN 845,328 (USD 1,870) – a 23% reduction. The cost of a nutritious diet for breastfeeding mothers could be reduced by 23%, but this has little impact on children's diets (Figure 3).

If a typical poor household adopted both of the previous practices (Model 3), the annual cost of the FHAB diet for the entire family would be reduced from NGN 1,096,073 (USD 2,430) to NGN 630,612 (USD 1,395) – a 42% reduction. On an individual level, the cost of a nutritious diet for breastfeeding mothers could be reduced by 40%. For children under the age of two, the reduction could be up to 36%.

Development of recipes

The CotD assessment also found that the cost of a nutritious diet can be significantly reduced by incorporating underutilised nutritious, but cheap or free, food into the local diet. The analysis of different diet types presented by the software revealed 12 highly nutritious, but cheap and underutilised, food sources: sweet potatoes, maise, cassava, moringa leaves and pods (free), Malabar spinach (free), citrus fruits, sorghum, African cherry, cashew nuts, wheat bran, dried coconut kernel and amaranth leaf.

To improve the child feeding practices and to promote affordable complementary food among the marginalised farming communities, the ANRiN project team developed a recipe book comprised of 20 low-cost, nutritious recipes based on food items identified by the CotD analysis, considering the availability, price and nutrient content of all food items, as well as food preferences and dietary practices. All the recipes were developed with the active participation of community members of Ogo Oluwa and Afijio LGAs.

Conclusion

Although the FHAB diet was 2.7 times more expensive than the NUT diet, food items selected for the FHAB diet were still some of the cheapest options in the markets. Nevertheless, the CotD assessment showed that the cost of a FHAB diet remained high compared to the standard income of the target population. Households in the study area were unable to afford both nutritious food and non-food items, with an average 'poor' family expressing an affordability gap of around 120% of their income.

Overall, markets in the study area had a diverse range of food items that could fulfil all major macro- and micronutrient requirements. Based on this finding, we conclude that the *availability* of nutrient-rich foods is not the main barrier to typically poor households obtaining a nutritious diet. These results appear to justify the aim of the ANRiN project to enhance children's nutritional status by reducing *affordability* gaps through the development and promotion of low-cost, nutrient-dense recipes. This study demonstrates the way the CotD method and software can be used, not only to understand the extent to which economic constraints may affect an individual's or household's ability to meet the nutritional requirements of the mother and children, but also to develop tools, such as the recipe booklet, which could significantly improve maternal and child nutrition during the first 1,000 days.

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Figure 2 Effects on the CotD of a poor household when increasing moringa leaf (as free food) consumption during the dry season

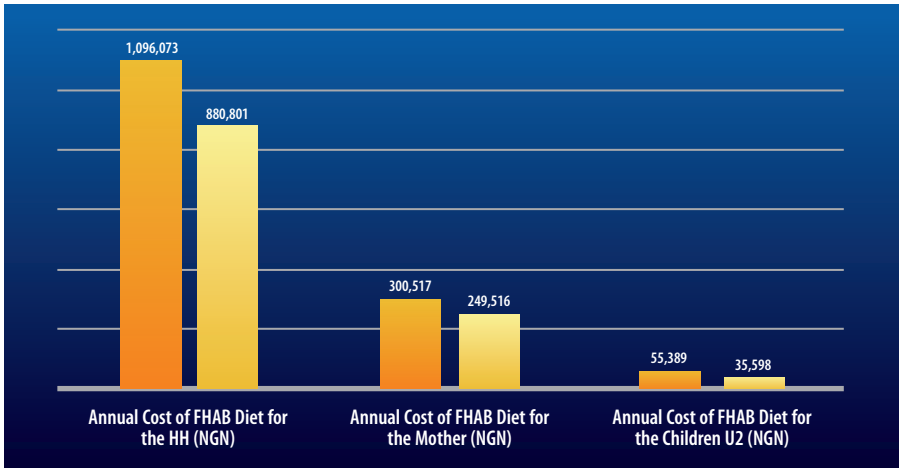
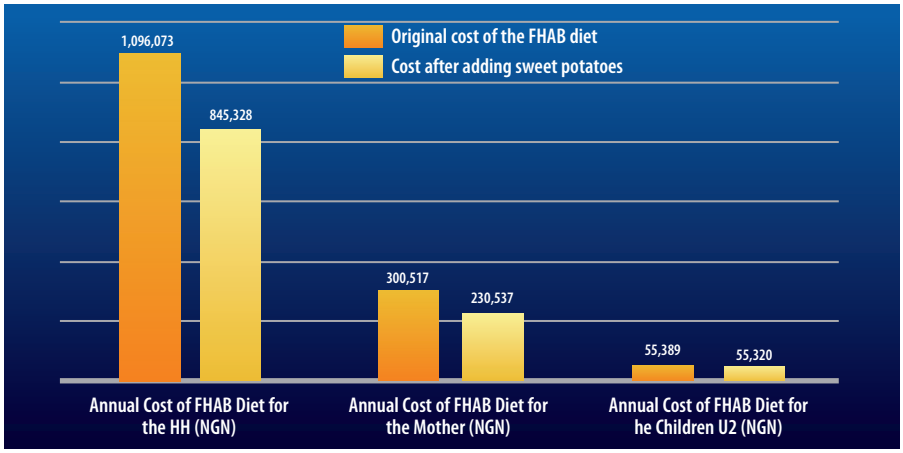


Figure 3 Effects on the CotD of a poor household when increasing (orange-fleshed) sweet potato consumption



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A parent bring their children to a health and nutrition screening at a village health post in Kupang City, East Nusa Tenggara Province, Indonesia

The cost of delivering severe wasting treatment in East Nusa Tenggara, Indonesia

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KEY MESSAGES

- This article outlines the first costing exercise of the integrated management of acute malnutrition (IMAM) programme in East Nusa Tenggara (NTT) province, Indonesia.
- It was estimated that USD4.8 million would be required annually to achieve the Government of Indonesia (GoI)'s 2024 targets of 90% treatment coverage in 60% of all primary healthcare centres.
- Models also indicated that improving treatment coverage may dramatically increase the cost-efficiency of IMAM services, suggesting that scale-up efforts should prioritise increasing coverage in high-burden areas.

Background

In Indonesia, over two million children under the age of five are severely wasted – the fourth-highest burden in the world. GoI has committed to reducing the prevalence of child wasting from 10% to under 7% by 2024. In 2021, a Presidential Decree on child stunting was issued, setting an ambitious target to provide treatment to 90% of severely wasted children by 2024. To achieve this, the Ministry of Health (MoH) plans to ensure that at least 60% of all primary healthcare centres (puskesmas) provide IMAM services by 2024.

IMAM programming was initiated in all 34 provinces of Indonesia by June 2021, yet the number of outpatient facilities offering IMAM services remains limited. Lack of evidence on cost, cost-efficiency and cost-effectiveness is a key barrier to resource allocation for scaling up IMAM services, and therefore of improved treatment coverage. To support GoI in evidence-based resource allocation and implementation planning, UNICEF carried out a costing exercise using IMAM data collected from Kupang Municipality and Kupang District in NTT province in 2021. The IMAM programme was first introduced in Kupang District in 2015 and was replicated by Kupang Municipality in 2018.

The goal of this costing exercise was to estimate the cost and cost-efficiency[1] of the IMAM programme (measured as the cost per child admitted for treatment of severe wasting) and to estimate the financial resources required to progressively achieve GoI's coverage target for IMAM services.

The costing approach

Data on resource usage were collected from Kupang District and Kupang Municipality according to the national prevention and treatment of child wasting guidelines (MoH, 2019). This included data relevant to the cost of community mobilisation, to outpatient treatment for uncomplicated cases and inpatient treatment for complicated cases, and to infants below the age of six months, as well as costs for overall programme management and oversight.

Since this analysis was conducted from the government perspective, all costs carried by implementing institutions were included. Any costs to child caregivers were outside the scope of analysis. Primary and secondary data were collected through document review and key informant interviews, with most interviews conducted by telephone due to COVID-19-related restrictions.

The analysis used a bottom-up 'ingredients approach' whereby the resources used to implement the IMAM programme (the 'ingredients') were identified, the required number or volume of each resource was estimated and the unit cost of each resource was determined. The total cost of the IMAM programme at a given scale was then estimated by multiplying the total volume of resources required by the unit cost of each resource. For example, the total cost of treatment (personnel time per child) was calculated by multiplying the average time spent with a child at the outpatient care site by the cost of personnel time based on standard salary grids provided by the MoH.

A modified version of the Food and Nutrition Technical Assistance (FANTA) community-based management of acute malnutrition (CMAM) costing tool (FANTA, 2012) was used to categorise the resources (Table 1), as well as to guide data analysis.

[1] It was not possible to assess the cost-effectiveness (e.g., cost per child recovered from severe wasting) of the IMAM programme due to insufficient data on treatment outcomes.

Table 1 Resources required for community-based management of child wasting

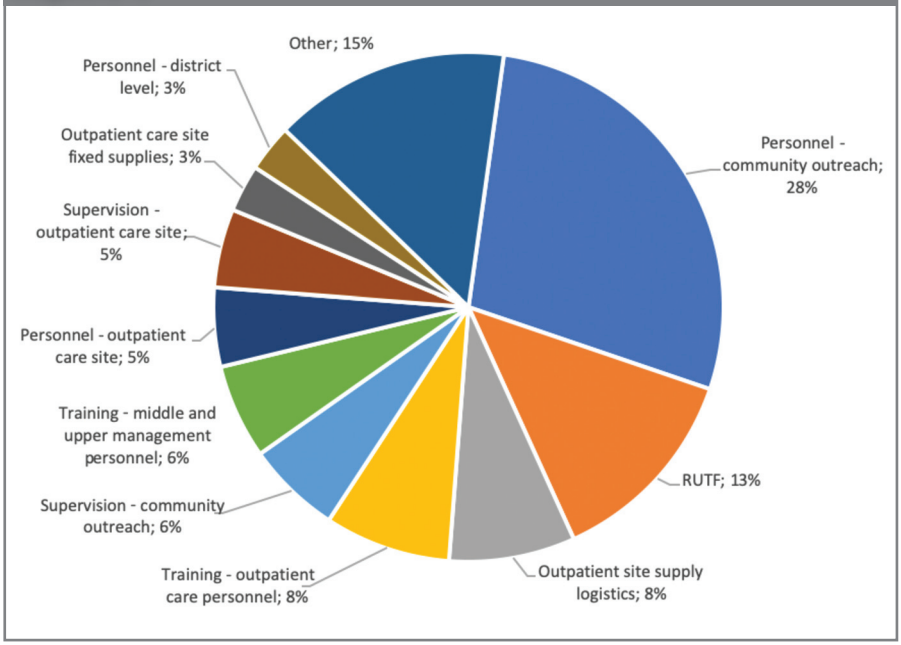
Cost category*	Resources
Treatment supplies (medical)	Medicines for infection treatment; diarrhoea; deworming; malaria; vitamin A supplementation; measles vaccinations; routine tests; intravenous kits; nasogastric tubes
Treatment supplies (other)	Ready-to-use therapeutic food (RUTF) therapeutic milk (F-75, F-100); non-consumable clinic supplies (scales; height boards; job aids; stationery; food preparation supplies; etc.)
Supply logistics	Transportation and warehousing for therapeutic food and treatment medicines (including fuel; loading/offloading; driver per diems; warehouse rental and maintenance; salaries and benefits of drivers and guards; etc.)
Community outreach	Salaries and benefits of outreach personnel or incentives for community workers/volunteers
Training	Time of trainees; venue hire; refreshments; trainer fees; per diems; transportation; accommodation; training materials
Supervision	Salaries and benefits of supervision personnel; transportation for supervision visits
Treatment personnel	Salaries and benefits of technical personnel at the treatment clinic
Management	Salaries and benefits of managerial personnel
Intermediate and central level	Training (time of trainees; venue hire; refreshments; trainer fees; per diems; transportation; accommodation; training materials); supply logistics (transportation and warehousing for therapeutic food and treatment medicines including fuel; loading/offloading; driver per diems; warehouse rental and maintenance; salaries and benefits of drivers and guards; etc.); salaries and benefits of managerial personnel

* Categories were informed by the FANTA CMAM costing tool (FANTA, 2012)

The volume of resources used to implement each component of IMAM was estimated for a given year using 2019 as a reference, as service delivery was dramatically reduced during the peak of the COVID-19 pandemic.[2] Costs were collected in Indonesian rupiah and converted to US dollars at an average exchange rate for 2021. No adjustment for inflation was made due to the one-year timeframe. The annual usage cost of capital items[3] by inpatient and outpatient clinics was calculated based on the assumption that each item would be replaced every three to five years.

To ensure a high quality of analysis, any unexpected or atypical results were discussed within the costing team and data errors were identified and rectified. Uncertainty in the total costs required was handled by estimating a 'most likely cost' scenario, as well as plausible 'low-cost' and 'high-cost' scenarios. For example, the average total time spent by outpatient treatment personnel with each child was an estimated average of 53 minutes per child per visit to the care site. This was used to inform the 'most likely cost scenario'. However, according to key informant interviewees, personnel time spent per child ranged between 24 minutes per visit (the 'low-cost' scenario) and 72 minutes per visit (the 'high-cost' scenario).

Figure 1 Top 10 cost drivers of delivering the IMAM programme



Findings

A total of 297 children were admitted for wasting treatment in Kupang District and Kupang Municipality, of whom 72 were admitted initially to inpatient care before being discharged to outpatient care to continue treatment. Inpatient care was provided in three hospitals, outpatient care was provided in 21 *puskesmas* and community outreach was conducted in 647 *posyandu* (community health posts). Inpatient care lasted an average of seven days for children aged 6–59 months, and 21 days for children below the age of six months. Outpatient care lasted an average of six weeks, with weekly follow-up visits. Outcome data from the inpatient care sites were unavailable, so for the purposes of estimating costs we assumed that 100% of children admitted were discharged to outpatient facilities and were not lost to follow-up. We also assumed that there was no defaulting during outpatient care.[4] Data indicated that, on average, 14.6 kg of RUTF was used per child in outpatient care.

The aggregate staff time required in the outpatient care sites to care for all admitted children totalled 0.60 full-time equivalent (FTE)[5] in Kupang Municipality and 0.68 FTE in Kupang District. Each admitted child received, on average, the equivalent of 1.1 days of aggregate staff time over the course of six weeks of treatment, or 1.5 hours at each clinic visit.

In the inpatient care sites, the aggregate staff time was 0.28 FTE in Kupang Municipality and 0.36 FTE in Kupang District. Each admitted child received an average of 1.9 days of aggregate staff time over 7–21 days while in care, or approximately 1.2 hours per day.

Cost-efficiency

The total cost of providing IMAM services for one year was estimated at USD96,725, with a low-cost estimate of USD71,350 and a high-cost estimate of USD135,171. The total cost

[2] In instances where there was insufficient quality primary or secondary data available on resource requirements, we relied on expert assumptions or norms built into the FANTA CMAM costing tool.

[3] Capital items are durable goods with a life use spanning more than one year, such as vehicles, buildings, computers, refrigerators, etc. It is common in cost analyses to include the value of the actual time spent using the capital goods, not the full cost.

[4] There were no empirical data that could be used to plausibly estimate potential loss or default rates. This is a limitation of the study.

[5] One FTE is the working time of one person employed full time, assuming a working day is eight hours and there are 260 working days per year.

[6] Note that, for the scale-up projections, geographic coverage refers to the provision of care at posyandu and puskesmas levels. For the base case calculations, the geographic coverage was estimated at 13% at posyandu level and 5% at *puskesmas* level.

was divided by the number of children admitted for treatment (N = 297) to derive a cost-efficiency estimate of USD326 per child admitted for treatment of severe wasting, with a low-cost estimate of USD240 per child and a high-cost estimate of USD455 per child. These are comparable to cost-efficiency results in other published studies (Chui et al, 2020).

Cost drivers

Personnel costs to conduct community outreach and screening was the largest driver (28%) of the overall cost of the IMAM programme, followed by the cost of RUTF (13%) and outpatient site supply logistics related to RUTF transportation and storage (8%) (Figure 1). Costs such as community outreach personnel, supervision or training were fixed based on the number of care sites, while costs such as RUTF and treatment personnel varied based on the number of children treated. With an increase in treatment coverage, variable costs will make up a larger proportion of the total, while fixed costs will decrease as a proportion of the total.

Cost modelling

To estimate the changes in costs relative to the scale-up of treatment services, a series of treatment coverage and geographic coverage scenarios were modelled, both independently and in conjunction with one another. Cost projections were conducted by identifying the cost categories that would vary with the caseload (such as RUTF or treatment staff time) and categories that would vary with the number of care sites (such as non-consumable clinic supplies or middle management supervision time).

Treatment coverage was calculated based on the total number of children admitted for treatment of severe wasting at the care sites in Kupang District and Kupang Municipality (N = 297), and as a percentage of the estimated district burden using reported prevalence of severe wasting in children under the age of five during the reference period (N = 9,357) (Isanaka et al., 2016; Laporan Nasional Riskedas, 2018). Geographic coverage of the IMAM programme was estimated at 13% based on the number of *posyandu* providing IMAM services (N = 647), divided by the total number of *posyandu* (N = 5,136).[6] The modelled coverage percentages were based on the MoH progressive targets for IMAM services through to 2024 (MoH, 2020). At the time of analysis, the estimated IMAM treatment coverage was 3.2%.

The annual cost of achieving GoI's 2024 targets of 90% treatment coverage in 60% of all *puskesmas* in NTT province was estimated at USD4.8 million (Table 2). To achieve global treatment coverage averages of 40% and geographic coverage of 43% (Rogers et al, 2015; UNICEF et al, 2012), an estimated USD1.8 million will be required. The projections from this costing exercise highlight that greater cost-efficiency (i.e., cost per child treated) could be achieved through improving treatment coverage within selected high-burden districts, rather than by increasing geographic coverage without improved treatment coverage.

Table 2 Cost and cost-efficiency projections based on treatment coverage and geographic coverage for NTT province*

Geographic coverage	Treatment coverage (of total burden) 3.2%	20%	40%	90%
13%	USD97,000 total USD326 per child	USD264,000 total USD141 per child	USD462,000 total USD124 per child	USD959,000 total USD120 per child
30%	USD302,000 total USD411 per child	USD715,000 total USD155 per child	USD1,206,000 total USD130 per child	USD2,433,000 total USD125 per child
45%	USD452,000 total USD410 per child	USD1,071,000 total USD154 per child	USD1,807,000 USD130 per child	USD3,648,000 total USD125 per child
60%	USD601,000 total USD409 per child	USD1,386,000 total USD150 per child	USD2,368,000 total USD128 per child	USD4,822,000 total USD124 per child

* Cost estimates are rounded to the nearest USD1,000.

Discussion

To our knowledge, this is the first published costing study of IMAM in Indonesia. Given contextual and epidemiological variations in severe wasting across Indonesia – which comprises 17,000 islands – additional costing exercises in other provinces are necessary to better estimate national-level investment requirements. One of the main limitations of this study was that IMAM treatment has not yet reached maturity in Indonesia and, as such, the levels of treatment and geographic coverage were relatively low at the time of the investigation. However, this exercise provides valuable insight into the financial resources required to scale up IMAM services and achieve the GoI targets by 2024. The total GoI budget allocation for nutrition services in 2022, including the treatment and prevention of child wasting, was USD2.95 billion. Approximately 3% of children affected by severe wasting in Indonesia are found in NTT. Approximately 0.16% of the national budget for nutrition-specific and sensitive interventions would be required for the province to achieve 90% coverage.

While the average cost per child admitted for treatment of severe wasting (USD326) was similar to that found by other studies (Chui et al, 2020), comparison of costs across studies and contexts is hampered by a lack of transparency in terms of analytical choices made, particularly regarding included versus excluded costs and how to factor in joint costs. In this exercise, the formal structure and transparency of the methods using the FANTA CMAM costing tool allow for replication. The analytical choices and adjustments made to the calculations can also be traced by following the data entered into the tool, alongside the formulas used.

It was beyond the scope of this study to investigate the preferences of, or potential cost savings to, child caregivers. However, other studies have demonstrated the benefits of improved access to outpatient care for uncomplicated cases of severe wasting, including lower default rates and better recovery rates (Puett et al, 2013).

Findings from this exercise have also shown that the cost-efficiency of IMAM services increases as treatment coverage improves. This suggests that scale-up efforts should prioritise increasing treatment coverage in high-burden areas. Potential options for improving the cost-efficiency of IMAM interventions could be explored, such as 'simplified approaches' to treating child wasting, particularly focusing on reducing RUTF dosage.

Future analysis could include an estimate of the cost of not treating children with wasting, the number of lives saved or the disability-adjusted life years averted. This would capture wider benefits of scaling up and improving the quality of IMAM services in Indonesia.

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The threat of social media towards exclusive breastfeeding: The Cambodia perspective

This is a summary of the following report: *World Vision International – Cambodia (2022) Under Social Media Influence: Digital Marketing of Breastmilk Substitutes in Cambodia.* **https://www.wvi.org/publications/cambodia/under-social-media-influence-digital-marketing-breastmilk-substitutes**

A Postscript below provides provides an additional perspective to the findings of this report.

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In Cambodia, improved internet access and increasing social media use have driven an exponential rise of digital marketing strategies, including for commercial milk formula products. In 2020, 79% of Cambodia's population used the internet, in contrast to 6% of the population in 2013. Similarly, active social media users in Cambodia have substantially increased from 27% in 2016 to 74% in 2022, with the most popular social media platform being Facebook (with 11.6 million users and an advertisement exposure reach of 68% of users).[1]

The International Code of Marketing of Breastmilk Substitutes (or 'Code'),[2] as currently implemented in Cambodia within Sub-Decree 133, does not explicitly cover digital marketing strategies employed by commercial milk formula companies as Code violations. It only prohibits the marketing of commercial milk formula products "at the points of sale, in hospitals or health centres or any other places". Cambodia's Demographic and Health Surveys indicate that the percentage of children exclusively breastfed for the first six months of life has decreased from 74% in 2010 to 51% in 2021. Given this negative trend, it is concerning that no regulation oversees the wide range of online channels and social media platforms utilised for commercial milk formula promotion, given that the aggressive marketing of commercial milk formula products undermines breastfeeding benefits and norms.

The recent report reviewed in this article documents various case studies on the digital marketing strategies utilised by commercial milk formula companies via a literature search for relevant documents (e.g., published papers, reports and social media posts) and structured interviews with lactating mothers, as well as with government and civil society stakeholders. Strategies identified include targeting commercial milk formula product advertisements to pregnant women and mothers using personal data on social media platforms; using social media influencers to promote various commercial milk formula products (e.g., across various life stages during their pregnancy and new motherhood), often paired with a health professional to add credibility; and hosting online support channels (websites, chats and groups) for advice on childcare and feeding while promoting commercial milk formula products. Digital advertisements also encourage the use of commercial milk formula products through emotional appeal (e.g., showing idealised family relationships of happy families, or mothers and children, in a commercial milk formula product advertisements); cross-promotion of commercial milk formula products with milk products for pregnant women; and discounts, sales or free samples of commercial milk formula products.

The report highlights challenges in monitoring Code violations on these platforms, as well as suggesting methods for improving such monitoring. The authors call for the government to update the legal framework by including a ban on marketing commercial milk formula products on social media and the internet, as well as restrictions on the use of health and nutrition claims to promote commercial milk formula products; to strengthen monitoring via developing appropriate tools for digital marketing and capacity training for government staff and monitors at national and sub-national levels; to state publicly, and enact, significant penalties for Code violations; to formally sensitise commercial milk formula company brand holders and ambassadors (e.g., influencers and health professionals) regarding the ban on marketing commercial milk formula products, and associated risks for violators; and to invest in breastfeeding promotion in digital media.

[1] In the application of statistics to advertising and media analysis, 'reach' refers to the total number of different people or households exposed, at least once, to a medium during a given period.

[2] **https://www.unicef.org.uk/babyfriendly/baby-friendly-resources/international-code-marketing-breastmilk-substitutes-resources/the-code/**

Postscript

Progress on monitoring and enforcing the Code in Cambodia: New developments to ban digital marketing

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In 2005, the Government of Cambodia adopted many provisions of the International Code of Marketing of Breastmilk Substitutes (the 'Code'). Through a sub-decree that addresses the marketing of products for infant and young child feeding (Sub-Decree 133), the national policy now supports breastfeeding by restricting the promotion of breastmilk substitutes (henceforth referred to as 'commercial milk formula'). In 2007, a *Joint Prakas*[1] between four line ministries (Health, Information, Commerce and Industry) was adopted as guidance to implement this decree. An Oversight

[1] *Prakas* is a Cambodian term that means 'official proclamation'. It is a ministerial or interministerial decision signed by the relevant minister(s). A proclamation must conform to the Constitution and to the law or sub-decree to which it refers.

Board with two arms – a Control Committee and an Executive Working Group – was formed seven years later, in 2014, to oversee monitoring, compliance and enforcement of the legal provisions for the Code in Cambodia.

Despite regulations, there remains widespread marketing of commercial milk formula in Cambodia, with significant growth in online and social media platforms. This is outlined in the report reviewed by this article,[2] in which World Vision International Cambodia highlights the increase in commercial milk formula promotion via digital platforms. The advancement in digital marketing strategies adopted by commercial milk formula companies undermines the importance of breastfeeding and exploits young mothers and parents in Cambodia. As noted in the recent Lancet Series on Breastfeeding,[3] commercial milk formula companies have profited, with an annual global revenue of USD 55 billion, externalising the costs to women and young children worldwide at an estimated loss of USD 350 billion per year. The Government of Cambodia, along with members of the Scaling Up Nutrition – Civil Society Alliance (including Helen Keller International, UNICEF, WHO, Alive & Thrive and World Vision International Cambodia), are collaborating to strengthen the Code regulations and their enforcement in Cambodia to protect the rights of women and young children. The authors therefore support the proposed updates of the Joint Prakas to explicitly ban digital marketing of commercial milk formula on social media and the internet, and to call for increased investments for appropriate training, monitoring and enforcement against such violations.

A major concern is that the marketing tactics of commercial milk formula companies not only increase sales of commercial milk formula, but also erode supportive breastfeeding norms, beliefs and practices. Uncontrolled marketing of commercial milk formula on digital platforms can cause Cambodian mothers to believe that commercial milk formula is superior to breastmilk. We are alarmed at the growing trend of social media influencers working as brand ambassadors and of health professionals endorsing and promoting commercial milk formula products in Cambodia. Formula feeding in urban areas is perceived to be a sign of modernisation and an up-to-date way of feeding children. In addition, there is a perception that mothers who give birth via caesarean section cannot breastfeed. There are an increasing number of maternity clinics in urban areas that do not promote breastfeeding due to their engagement with commercial milk formula companies. The decline in exclusive breastfeeding practices, particularly among vulnerable groups like female garment factory workers, has been documented in an unpublished assessment conducted by Helen Keller International, as well as in a published experience that describes World Vision International Cambodia's work with grandmothers[4] (Bauler et al, 2022). This urges immediate action to step up efforts to ensure effective implementation, monitoring and enforcement of Sub-Decree 133, as well as of other family-friendly policies related to parental leave.

UNICEF's report (2021) highlighted existing gaps in Cambodia's Code in terms of reflecting minimum standards and subsequent World Health Assembly resolutions. In addition to the lack of prohibition on the digital marketing of commercial milk formula products, there are major loopholes in Sub-Decree 133, including the absence of a strict prohibition on the promotion of infant and young child feeding products; the lack of provision to prevent the distribution of sample products, equipment and materials to health facilities, as well as of the sponsorship of events and scholarships to health workers by the manufacturers and distributors of commercial milk formula products; the absence of a ban on nutrition and health claims made by the infant and young child feeding products; and a lack of warning messages on labels regarding early introduction of commercial milk formula and its risk due to the presence of potential pathogens.

In June 2022, the Ministry of Health initiated an update to the Joint Prakas, which is yet to be endorsed by the relevant ministries. Since then, we have been anticipating positive developments that could limit the marketing of commercial milk formula through social/digital media platforms. UNICEF, Helen Keller International, Alive & Thrive, WHO and World Vision International are providing technical and/or financial support for this revision process. The key amendments to the legislation include limiting commercial milk formula promotion and supply in health facilities; expanding the targeted age groups for products under the purview of this legislation from zero to 24 months to zero to 36 months – including all products marketed or presented for feeding infants and young children, and commercially produced complementary foods; preventing false and misleading health and nutrition claims made by commercial milk formula companies; preventing advertisements and promotions made through social media platforms; and enacting strict penalties on manufacturers and distributors who undermine breastfeeding while promoting their products.

An essential part of our coordinated efforts has been the monitoring and enforcement of the Code legislation, which relies on promoting and supporting breastfeeding, as well as training monitors and healthcare staff on the contents of Sub-Decree 133. Alive & Thrive Cambodia's team has supported the Ministry of Health and trained healthcare providers on breastfeeding and lactation counselling, especially midwives who work in maternity wards. The team has also incorporated the legal provisions within the Early Essential Newborn Care Quality Improvement Guideline 2022 and the Maternal and Child Health Nutrition Score card tool used in the national Cambodia nutrition project, which is used to assess health facility quality. Helen Keller International has oriented healthcare staff to Sub-Decree 133, including nurses and midwives, and pioneered some early work to improve the monitoring and enforcement mechanisms in the country (Hou et al, 2019). Helen Keller International, along with WHO, Alive & Thrive and UNICEF, supports the Ministry of Commerce to identify and report Code violations submitted through the Cambodian court system.

To address the alarming trend of digital marketing of commercial milk formula, in February 2021, World Vision International Cambodia's technical team piloted an online reporting tool to capture any violations of Code legislation (including in retail stores and health facilities, as well as on social media). This tool has the option to share screenshots and links to online platforms that violate the legal provisions. This tool has been found to be effective in reducing paperwork according to the members of the Technical Working Group that provides recommendations to the Executive Working Group. Discussions are underway with the Ministry of Health to use this tool as an official government reporting system, as well as to allow the Executive Working Group to collate and analyse data and act on violations. This system has already been approved in principle by government representatives from the National Maternal and Child Health Centre, and the team is now checking for opportunities to build it into the ministry's website, which could allow development partners and the public to file complaints directly.

We believe that civil society partners need to continue their advocacy efforts, especially to ensure appropriate financing. There is a need for intensive efforts and political will from different line ministries, including to mobilise funds and to firmly commit to improve national breastfeeding rates. Further, effective enforcement will require continuing improvements to specific budget allocation by the Ministry of Health to support the monitoring of the Code; increasing political will and coordinating the enforcement of the Code regulations; and addressing the major bottlenecks of institutional human resources and capacity to support Code monitoring (UNICEF, 2021).

It is the collective hope of the authors of this postscript that the additional legislation, along with the updated Joint Prakas and the collaboration of government and civil society to monitor and enforce the related Code legislations, will support progress on breastfeeding and deter unethical marketing of commercial milk formula, including on digital platforms. We do not want to lose the momentum of the successes so far, and we encourage the commitment of a greater range of organisations and government ministries to protect breastfeeding and promote the responsible marketing of commercial milk formula in Cambodia.

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[2] https://www.ennonline.net/fex/69/the-threat-of-social-media-towards-exclusive-breastfeeding-the-cambodia-perspective
[3] https://www.thelancet.com/infographics-do/2023-lancet-series-breastfeeding
[4] https://www.ennonline.net/fex/67/cambodia garmentsandiycf

2022 Global Nutrition Report

This is a summary of the following report: *Global Nutrition Report (2022) 2022 Global Nutrition Report: The state of global nutrition.*

https://globalnutritionreport.org/reports/2022-global-nutrition-report/

The global nutrition crisis – already severe before the COVID-19 pandemic – has worsened, with worrying trends across every form of malnutrition, from hunger to obesity. Policy interventions to date are failing to reverse these trends, while conflict around the world (including the war in Ukraine) and the cascading impacts of climate change persist.

At the 2022 Tokyo Nutrition for Growth (N4G) Summit, stakeholders stepped up to make unprecedented commitments to improve global nutrition. As part of these efforts, the Global Nutrition Report was endorsed to create the world's first independent Nutrition Accountability Framework (NAF) (Box 1). The NAF ensures that all nutrition commitments, including and beyond N4G, can be made Specific, Measurable, Achievable, Relevant and Time-Bound (SMART) and are captured, standardised and monitored transparently.

The 2022 Global Nutrition Report analysed commitments registered in the NAF and found much to celebrate, with 198 stakeholders from 84 countries making 433 commitments and with 897 goals to improve nutrition. Most were made by 78 country governments (in a non-donor role), followed by 56 civil society organisations, 30 private sector businesses, 21 donors, 7 international organisations and 7 academic institutions. Collectively, stakeholders committed over USD 42.6 billion, with a strong focus on prioritising low- and lower-middle-income countries in Africa and Asia. The report outlines a strong intention to support leadership and governance in addressing undernutrition. A significant proportion of commitments are aligned with key global maternal, infant and young child nutrition targets. Furthermore, there are increased efforts to improve the SMARTness of goals, with a quarter of commitments ranking high for SMARTness.

There are still gaps in several critical areas. Specifically, the report summarises the increased need for:

A far broader constituency of actors to step up worldwide and make commitments that can be accounted for in improving nutrition

Commitments to reflect sustained and increased external and domestic public and private financing for nutrition that can be easily tracked

Far greater attention to be paid to food security that truly includes nutrition security in commitment-making

Commitments that will bring transformative policies for our food system and deliver universal access to healthy, affordable and sustainably produced food

Commitments that promote universal access to nutrition care services that are integrated in the health system

The report showcases the value of the NAF, sets the baseline for monitoring actions and serves as a call to action for all stakeholders. Only by seeing everyone's contribution accounted for, monitored, and reported can we deliver change and build resilience across the most vulnerable communities globally.

Box 1 Tools and platform available as part of the NAF

- The NAF Platform is a central, online and publicly available platform for stakeholders to sign up, register and, later, to report on the progress of their commitments.
- The Nutrition Action Classification System is a classification system that identifies types of action taken as "enabling", "policy" or "impact". Each classification is further divided into four distinct sub-categories.
- The Nutrition Action SMARTness Index is a ranking system that enables the assessment and reporting of the SMARTness of commitments as "high", "upper moderate", "lower moderate" or "low".
- The NAF Commitment Tracker is an online, interactive platform for making all data on commitments publicly available.

For more information about the NAF, please visit
https://globalnutritionreport.org/resources/naf/

The impact of climate change on nutrition: Learning from four countries

This is a summary of the following report: *World Vision (2022) The impact of climate change on nutrition: Policy brief.*
https://www.worldvision.ie/about/publications/the-impact-of-climate-change-on-nutrition/

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The effects of climate change have already taken hold across the world. Despite low greenhouse gas emissions, Africa is bearing the brunt of such changes, with severe weather patterns ranging from droughts to flooding, alongside devastating food security and health impacts. Climate change affects all forms of malnutrition through pathways and interlinkages related to the three determinants of malnutrition identified in the UNICEF Conceptual Framework.[1]

Programmes that do not include adaptations to climate change struggle to improve malnutrition. World Vision Ireland's Access Infant and Maternal Health Plus Programme has been implemented in areas affected by climate change that have experienced challenges in improving nutritional outcomes.

This policy brief explores the different forms of climate and nutrition challenges experienced by communities targeted by the programme. The brief is based on a study commissioned by World Vision Ireland, which explored challenges and local responses to the climate and nutrition problems experienced in four African countries – Mauritania, Sierra Leone, Tanzania and Uganda – producing case studies for each.

The case studies found that both agricultural production and food hygiene practices have been severely affected by droughts and floods; women's time and work burdens have increased, subsequently impacting infant and young child feeding practices; food quality has deteriorated; food prices have increased; diets have deteriorated in both quantity and quality; and waterborne diseases have increased – all of which are attributed to climate change.

Adaptations and mitigations

Both communities and World Vision staff described several programme approaches that appeared most promising in meeting the challenges described: the promotion of conservation agriculture and keyhole gardens; the introduction of drought-tolerant and biofortified crops; new water sources and treatments; fuel conservation measures; gender equality activities; and training on post-harvest handling and measures to prevent communicable diseases. The ways in which the programme and communities responded were notable; they used existing pro-

[1] https://www.unicef.org/media/113291/file/UNICEF20Conceptual20Framework.pdf

Drought in the Somali region of Ethiopia is hitting the population very hard

gramme models, local partners, community structures and innovation to address the devastating effects of climate change on nutrition.

Generalisable recommendations for programmes to improve nutrition in the context of climate change

Given the far-reaching consequences of climate change on nutrition, well-integrated and ***flexible programmes*** are required. These will necessarily span different sectors, such as agriculture, health, gender, disaster risk reduction and others. Building resilience in each sector is essential; gender empowerment is also key.

A flexible and ***localised strategy*** for climate change and nutrition is needed, drawing on a set of core project models and a mechanism to diagnose and adapt according to context. For example, local partners can draw on local and indigenous knowledge. Local agriculture research stations make plant available varieties that are adapted to the new climate conditions and to local pests and diseases.

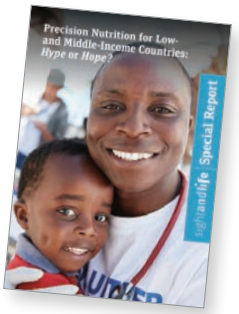
Capacity building at all levels of the organisation for climate change adaptation is also necessary. Drawing up guidelines using in-house and global resources is necessary, with a full list of possible measures to take.

Strong ***community resilience*** is essential to adapt to climate change, and this can be nurtured to help communities cooperate, adapt, advocate and innovate in the face of the new challenges.

A ***systematic monitoring*** system designed to cross all sectors is necessary for organisations to share their experiences and build evidence about challenges and effective strategies.

It is extremely urgent that the devastating effects of climate change on nutrition should be addressed. This series of case studies shows that communities and organisations can work together in a myriad of ways to try and build local resilience. However, mitigation on a global scale is imperative.

Precision nutrition in low- and middle-income settings



This is a summary of the following paper: *Sight and Life (2022) Precision Nutrition for Low- and Middle-Income Countries: Hype or Hope.* **https://sightandlife.org/resource-hub/ magazine/precision-nutrition-for-low-and-middle-income-countries-hype-or-hope**

Precision nutrition (Box 1) is an emerging area of research that falls under the umbrella of precision medicine – an approach that has yielded big wins in developed countries across areas such as targeted cancer therapy or microbiome sequencing, following the introduction of Big Data into healthcare. Physicians have known for decades that individuals respond individually to different treatment regimens, yet only now do they have the tools at their disposal to delve into the reasons behind this. While targeted treatments may therefore yield the greatest benefit on an individual level, precision medicine creates a dilemma for public health professionals who deal with healthcare at the population level. This is especially pertinent for lower-income countries, where resources are often constrained to the point that even basic healthcare remains a challenge. Is a move towards precision nutrition therefore irrelevant, or do these very challenges increase the need for more precise, efficient approaches?

The authors of the report highlight the importance of targeting the most vulnerable groups with a precision nutrition approach. Using the example of pregnant women with anaemia – which affects between 33% and 75% of pregnant women in developing countries (Abdallah et al, 2022) – such a strategy could deliver cost-effectiveness, given that interventions could be distributed in smaller amounts rather than through costly blanket supplementation. Anaemia reduction can boost productivity by providing additional economic benefits for this group, and increasing nutrient status in mothers can reduce the subsequent burden of disease in their children, reducing healthcare costs further down the line. This represents a more strategic application of resources rather than the blanket approach that national health systems employ today.

The report also highlights a pyramid infographic that outlines the accessibility of different approaches (p. 14) and methods (p. 15). It notes that demographic surveys, which make up the bulk of many nutrition research projects, are at the base of the pyramid – accessible and not constrained by resources, yet imprecise and limited – with lifestyle data collection presenting the next step in personalisation. Such data (diet, physical activity, dietary diversity, etc.) are commonplace, but not routinely measured in all settings. At the tip of the pyramid, and currently too costly for many low- and middle-income countries (yet becoming more accessible), are genetic and omics methods. These are not yet routine in high-income settings, but are currently available through many private healthcare systems. The spectrum of phenotype measurements (anthropometry and clinical biomarkers) at the accessible end of the pyramid, and of metabolic indicators (wearable devices, oral glucose tolerance tests, gut microbiota analysis, etc.) at the other end, are also represented here.

Although this road map for the future may be exciting, representing a shift from generic guidelines such as the Food Pyramid towards targeted, personalised and ultimately precision nutrition (p. 77), the field remains in its infancy, and scale-up of such technology remains unfeasible within many poorer health systems.

> ***"Precision nutrition is in its early stages and too soon to introduce as a treatment for chronic diseases in the general population. Research is being conducted on the application of precision nutrition for obesity, metabolic syndrome, certain cancers, and type 2 diabetes"***
> (Harvard T.H. Chan School of Public Health, 2023)

A detailed breakdown of this report is beyond the scope of this summary, but readers are encouraged to explore this topic further by accessing the full report. It also provides a useful glossary of precision nutrition terminology (p. 6), helping readers make sense of a complex topic where nutrition, biochemistry, genomics and the computer sciences intersect.

Box 1 What is precision nutrition?

Precision nutrition evaluates an individual's unique DNA, race, gender, health history, lifestyle habits, microbiome and metabolic response to specific foods or dietary patterns to determine the most effective eating plan to prevent or treat disease. It aims to provide safer and more effective ways to prevent and treat disease by providing more accurate and targeted strategies. Precision nutrition assumes that each person may have a different response to specific foods and nutrients, so that the best diet for one individual may look very different from the best diet for another.

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Abdallah F, John S, Hancy A et al (2022) Prevalence and factors associated with anaemia among pregnant women attending reproductive and child health clinics in Mbeya region, Tanzania. PLOS Global Public Health, 2, 10. https://journals.plos.org/globalpublichealth/article?id=10.1371/journal.pgph.0000280

Harvard T.H. Chan School of Public Health (2023) The Nutrition Source: Precision Nutrition. https://www.hsph.harvard.edu/nutritionsource/precision-nutrition/

An iron and folic acid supplement programme is helping protect adolescent girls from anaemia

Undernourished and overlooked: A global nutrition crisis in adolescent girls and women

This is a summary of the following report: *UNICEF (2023) Undernourished and overlooked: A global nutrition crisis in adolescent girls and women.* **https://www.unicef.org/reports/undernourished-overlooked-nutrition-crisis**

Undernutrition, micronutrient deficiencies and anaemia amplify gender inequalities by lowering learning potential, wages and life opportunities for adolescent girls and women, weakening their immunity to infections and increasing their risk of life-threatening complications during pregnancy and childbirth.

This report examines the status, trends and inequities in the nutritional status of adolescent girls and women of reproductive age (15–49 years), and the barriers they face when accessing nutritious diets, utilising essential nutrition services and benefiting from positive nutrition and care practices in low- and middle-income countries, especially in the context of the ongoing global food and nutrition crisis.

The authors analysed data from more than 190 countries, representing over 90% of adolescent girls and women globally. Data from national surveys were used to summarise the available information on underweight, short stature, anaemia, dietary diversity and access to essential nutrition services for adolescent girls and women.

The report highlights eight key findings (Box 1), which show that the world is failing to respond with adequate policies to make the right to good nutrition a reality for all adolescent girls and women. At least two-thirds – or more than a billion – of adolescent girls and women worldwide suffer from undernutrition (underweight and/or short height) and/or micronutrient deficiencies, including anaemia. Globally, 8% of adolescent girls (49 million) and 10% of women (154 million) suffer from underweight, and almost one in three adolescent girls and women (30%, or 571 million) are living with the debilitating effects of anaemia. At a regional level, one-third of adolescent girls and women (35%, or 171 million) are shorter than 150 cm in South Asia, compared with 10% (15 million) in Eastern and Southern Africa and 7% (9 million) in West and Central Africa.

The authors outline 10 recommendations (Box 2) calling for the transformation of food, health and social protection systems for adolescent girls and women by ensuring access to nutritious, safe and affordable diets.

Box 1 Key findings from the report

1. No region is on track to meet the 2030 global targets to reduce anaemia and low birthweight, and acute malnutrition has risen by 25% since 2020 in crisis-hit countries.
2. Disadvantaged adolescent girls and women, and girls and women living in poorer regions, bear the brunt of undernutrition and anaemia. South Asia and sub-Saharan Africa are home to 68% of adolescent girls and women with underweight and 60% of adolescent girls and women with anaemia.
3. Poor nutrition is passed down through the generations: about half of children under the age of two with stunting are estimated to have become stunted during pregnancy and the first six months of life.
4. The global food crisis is deepening the nutrition crisis for adolescent girls and women. Girls and women across the world have found themselves disproportionately hit by the impact of the COVID-19 pandemic on livelihoods, income and access to nutritious food.
5. Adolescent girls and women struggle to access nutritious diets. With rising poverty and inequities in low- and middle- income countries, there is concern that millions of girls and women will turn to cheap ultra-processed unhealthy foods that are low in essential nutrients and high in salt, sugar and unhealthy fats.
6. Harmful social and gender norms and practices block progress on the nutrition of adolescent girls and women.
7. Nutrition services and social protection programmes are failing to meet the nutrition needs of adolescent girls and women, especially in humanitarian settings. Nutrition services are not reaching adolescent girls and women with adequate coverage and equity.
8. Adolescent girls and women lack strong policy protection against undernutrition. These barriers hinder policy coherence and multi-system and multi-sector actions to improve nutrition.

Box 2 Key recommendations from the report

Nutrition governance for adolescent girls and women

i) Build bolder leadership to mobilise institutions, leverage resources and galvanise action for adolescent girls' and women's nutrition more effectively.
ii) Harness data and evidence to inform policy and programme decisions and strengthen accountability for adolescent girls' and women's nutrition.

Food systems and nutritious diets

i) Improve access to affordable nutritious foods – including fruits, vegetables, eggs, fish, meat and fortified foods – for all adolescent girls and women.
ii) Implement policies and mandatory legal measures to protect adolescent girls and women from nutrient-poor and unhealthy ultra-processed foods and beverages.

Nutrition services and social protection programmes

i) Improve access to essential nutrition services for adolescent girls and women before and during pregnancy and while breastfeeding, including in humanitarian crises.
ii) Expand access to social transfer programmes for adolescent girls and women, including in fragile settings and humanitarian crises.

Nutrition and care practices

i) Use multiple communication channels (print; broadcasts; social and digital media) to reach adolescent girls, women and the general public with advice on nutrition and care practices.
ii) Strengthen the coverage and quality of counselling to help adolescent girls, women and their family members make decisions and take action to improve nutrition.

Social and economic empowerment

i) Implement gender-transformative policies and legal measures that strengthen the social and economic empowerment of adolescent girls and women.
ii) Accelerate the elimination of discriminatory gender and social norms to enable adolescent girls and women to realise their rights to food and nutrition.

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Cover

Front: Merankebandi participant tending to her kitchen garden. Burundi, 2021.
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Back: A trader selling food items in a rural market in Oyo state. Nigeria, 2022.
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About ENN

Emergency Nutrition Network (ENN) is a UK registered charity that strives to enhance the effectiveness of nutrition policy and programming by improving knowledge, stimulating learning and building evidence. We are passionate about being field-driven and are globally recognised as thought leaders and conveners in nutrition.

ENN is based in the UK but works globally and is made up of a team of technical experts in nutrition with decades of collective experience in the field. We work alongside governments, the United Nations, non-governmental organisations or charities, and research institutions worldwide to look critically at existing practices, raise awareness of issues and drive change so that those working to tackle malnutrition can do the best possible job. We do this by:

1. Capturing what works and what is needed to reduce malnutrition – working with people implementing programmes to help them examine their experiences and document their achievements and challenges.
2. Coordinating technical bodies to increase the global understanding of malnutrition – particularly focusing on the most nutritionally vulnerable including infants and children, adolescent girls and mothers who are pregnant or are feeding their infants.
3. Supporting global efforts to reduce malnutrition – bringing our knowledge and technical expertise to strengthen the activities of organisations working to reduce malnutrition at the global level.

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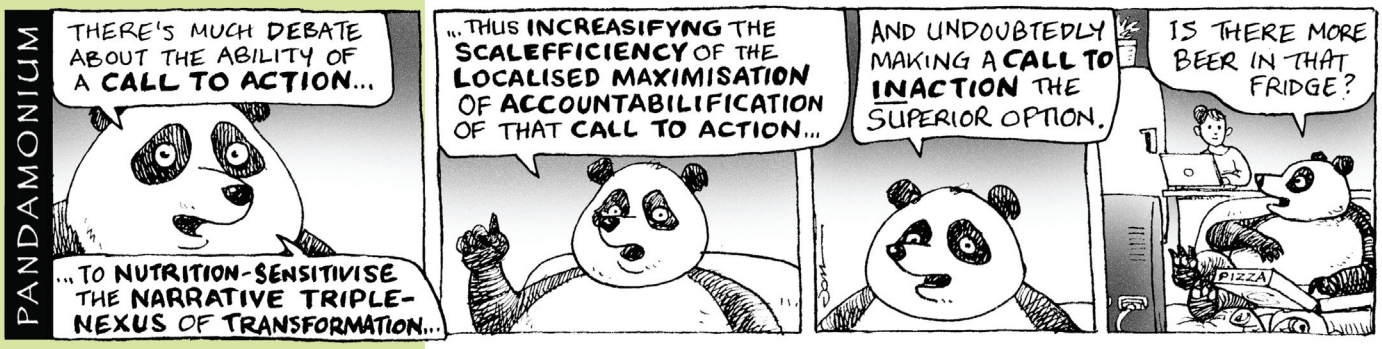

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