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Field Exchange

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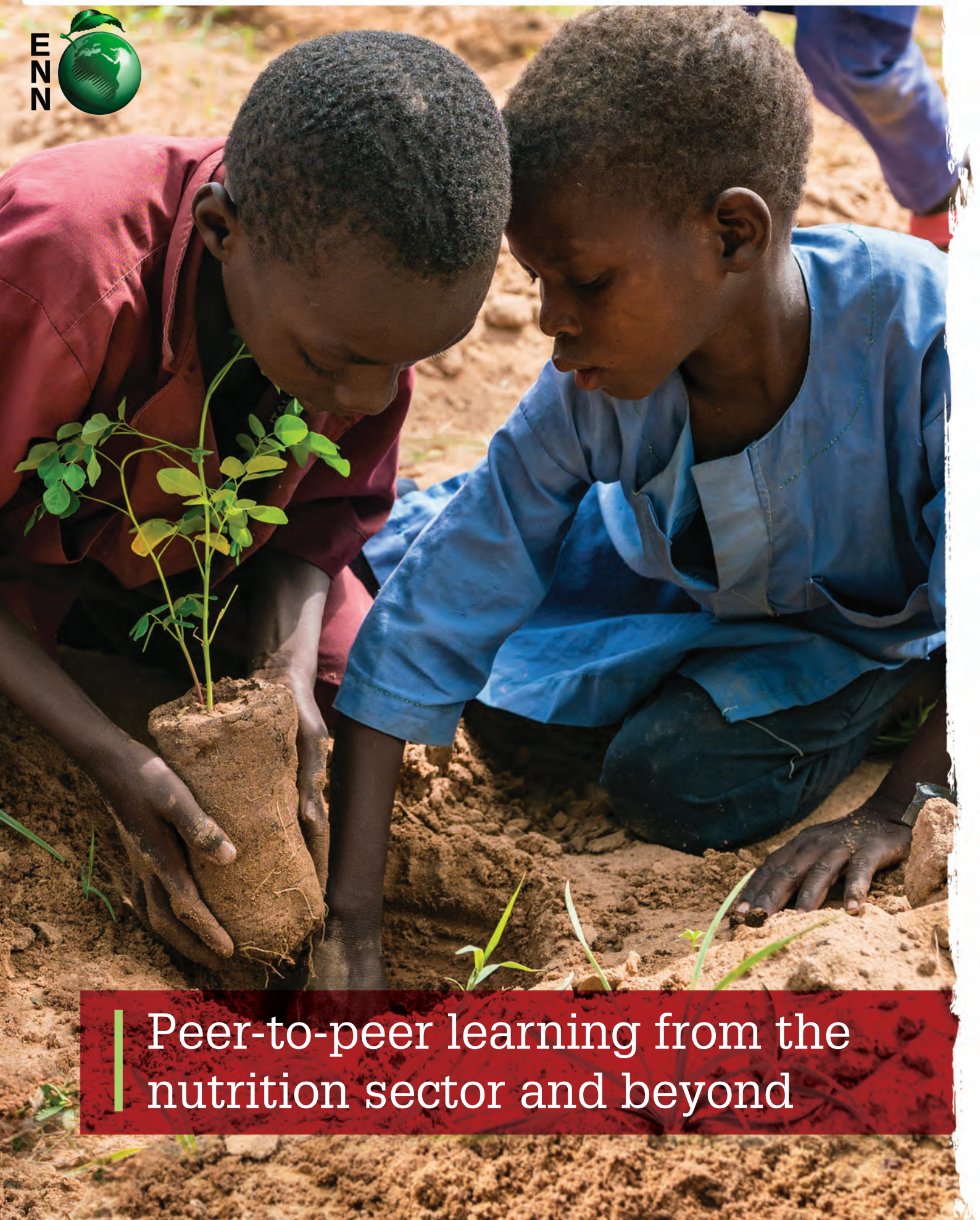
Emergency Nutrition Network



Peer-to-peer learning from the nutrition sector and beyond

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Editorial

Dear readers,

Welcome to the 71st edition of Field Exchange, featuring a typically wide range of content from practitioners and researchers. This issue looks beyond the more 'usual' nutrition approaches to delve into the social sciences, the use of private sector techniques, and considering bioenergy in the context of food security. All of this serves to remind us that the multifaceted nature of (mal)nutrition requires multisectoral and multisystem solutions.

Several of these articles highlight the importance of understanding context and keeping/placing communities at the heart of the design, planning, and implementation of nutrition interventions for them to be acceptable and appropriate. **Titus et al (page 15)**, building upon their prototype intervention featured in Field Exchange 68[1], took a 'user centred behavioural science' approach to address barriers to 'Family MUAC' and to optimise its use in real-world conditions in a pilot study in Mali. **Yusuf et al (page 12)** adopted a 'service design approach' to adapting the provision of wasting treatment through the integrated community case management platform for implementation in Somaliland. A key learning point from the latter was the programme's ability to learn in real time, adapting to data and operational challenges as they arose, rather than waiting for a pre-determined review period, as is common for many nutrition programmes and pilots.

Sauvegrain et al (page 9) adopted an anthropological perspective to understand caregivers' perception of their children's diet and development. This article from Laos highlights the importance of understanding communities and 'speaking the same language', as not all intentions carry the same meaning. Additionally, local foods should be considered not only from a nutrition security and resilience angle but also for their cultural and symbolic qualities. Leading on from this, the article by **Thurman et al (page 18)** explores how we can use private sector techniques more effectively to engage with communities and drive demand for healthy nutritious diets.

An article by **Fracassi et al (page 3)** introduces what is perhaps a less familiar topic for many of us at Field Exchange – bioenergy and nutrition. Often the linkages between the two are seen as negative in terms of competition for resources such as land. However, this article highlights practices from the literature and case studies whereby bioenergy value chains can positively impact nutrition and food security. The authors also illustrate the need for more collaborative food systems approaches to address the complex and interdependent challenges of climate, health, and nutrition more sustainably.

Continuing the theme of resilient food systems, **pilot findings from Malawi (page 7)** highlight that food insecurity, climate vulnerability, and poverty are key drivers of the poor nutrition situation across two districts, where 85% of households had experienced loss of crops due to droughts or floods in the previous 12 months. In addition, maternal mental health, an often-overlooked area, was also found to be associated with poor nutrition. The relationship between maternal depression and child nutrition is also explored in a study by **Din et al (page 29)**, summarised.

On a different note, in our last issue we published a summary of the recently updated World Health Organization guidelines on the management of acute malnutrition. Building on this summary, we feature a views article based on a recent blog written by **Marie McGrath (page 6)** that highlights how principles and practices for continuity of quality care for small and nutritionally at-risk infants under six months and their mothers, described in the MAMI Care Pathway approach, are embedded in the revised guidelines.

Finally, we feature our usual array of summaries of recently published research and reports, covering topics ranging from climate change to school feeding to novel treatments for severe wasting, which we hope you find interesting and engaging. Happy reading!

Anne, Nicki, Philip and Tom

[8] https://www.ennonline.net/fex/68/optimisingmuacmali

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At global level, 2.3 billion people still lack access to clean cooking (IEA, 2023). Ghana, 2012

Bioenergy and nutrition:

Reflections from a week of learning in Bangkok

Patrizia Fracassi
Senior Nutrition and Food System Officer at the Food and Agriculture Organization (FAO)

Maria Michela Morese
Senior Natural Resources Officer at FAO

Tiziana Pirelli
Coordinator of the Global Bioenergy Partnership (GBEP)

Tomoko Kato
Nutrition Officer at FAO

Lorenzo Testa
Energy-Smart Agrifood Systems Advisor at FAO

What we know:

Access to energy remains an essential prerequisite for achieving many Sustainable Development Goals (SDGs). Modern bioenergy – renewable energy produced from organic matter – can play an important role in nutrition security, particular through improved soil quality, enhanced rural livelihoods, and better cooking practices (Global Bioenergy Partnership, 2022).

What this adds:

This two-part article summarises a recent paper on the linkages between bioenergy and nutrition (Testa et al, 2023), exploring novel solutions for achieving the SDGs, before reflecting on the 10th edition of the Bioenergy Week, which took place in Bangkok on 24–27th October 2023. This piece offers an important entry point for those in the nutrition sector to engage more broadly with colleagues working in food, energy, and economic systems.

By 2050, nourishing a global population of almost 10 billion people will require a radical transformation in how food is produced, processed, traded, and consumed. Access to affordable, reliable, sustainable, and modern energy in many developing countries will represent a crucial dimension of this transformation.

However, progress toward the achievement of affordable and clean energy (SDG 7) is slow. More than 2.3 billion people (around 30% of the global population) still do not have clean cooking facilities and roughly 800 million people do not have access to electricity (IEA, 2023). This constitutes a fundamental barrier to reducing hunger, achieving food security, and promoting sustainable agriculture (SDG 2).

To explore the challenges and opportunities that building an affordable and clean energy system can bring to global nutrition – specifically the role of bioenergy within this – we first consider a literature review of 53 studies, published between 2006 and 2021 (Testa et al, 2023) (Figure 1). This review includes peer-reviewed papers, technical articles, documents published by non-profit organisations, government documents, and examples of good practices from case studies at national and local level.

Six main practices were identified where modern bioenergy value chains can positively impact food security and nutrition:

Phytoremediation: Can reverse soil erosion, contamination, desertification, and acidification by removing pollutants and utilising green plants. Phytoremediation is shown to be a cost-effective solution and the use of perennial bioenergy crops, which can lower soil contamination, is the subject of current research. As an example, heavy metals (from animal waste) can be removed using species such as *Eichhornia crassipes*.

Integrated biomass production systems: Strategies such as crop rotation (planting different types of crops sequentially on the same plot of land, such as leguminous and cereal species, e.g., *alfalfa* and corn) and intercropping (cultivating multiple crop species simultaneously in the same field) may allow for biomass crop production in agricultural or forestry contexts. This is possible, despite public perception that food and biomass crops will compete for resources. Indeed, intercropping with leguminous species has the potential to increase soil nitrogen content and improve soil fertility (e.g., intercropping *Gliricidia sepium* with cash crops, which reduces soil degradation).

> ***"The positive relationship between bioenergy and nutrition is an overlooked nexus, whose analysis has been too often limited to the competition for resources, such as land, water, energy, and other inputs."***

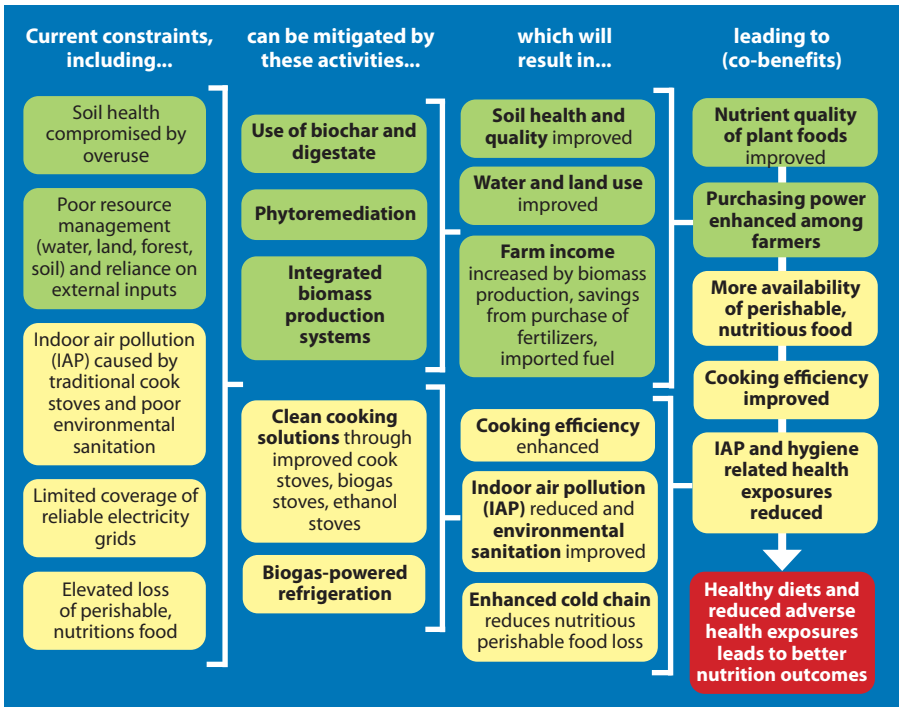
Using biochar: Can improve soil health by boosting the concentration of plant nutrients (such as calcium, magnesium, sodium, and potassium), detoxifying pollutants, and improving soil water-holding capacity. Biochar is the solid, carbon-rich by-product derived from the thermochemical conversion of biomass, which produce syngas, a gaseous biofuel, as main product. Adding biochar to soil was shown to favourably impact fruit production, fruit quality, and resistance to powdery mildew – a fungal disease.

Using digestate: As the main by-product of converting organic matter into biogas, digestate (or 'bioslurry') has been shown to be an effective biofertiliser for crops – highlighting its value within a circular economy. Evidence on the efficacy of digestate as a fertiliser in the long term is mixed, although it remains an important tool in the nutrition security toolbox.

Clean and modern energy for cooking: Switching from conventional to improved feedstock (e.g. pellet, briquettes) and cooking technologies (e.g. cookstoves) could led to improved indoor air quality as well as dietary diversity. Lower respiratory infection – which is more prevalent in those who use conventional cookstoves – is one of several infectious states which has a bidirectional relationship with malnutrition. Cleaner cooking, mediated via reduced carbon monoxide and black carbon, can ameliorate this problem. In India, improved stoves offer higher cooking temperature and time control, which allowed participants to introduce novel foods into their diets that would otherwise be too time-consuming or too at risk of spoilage to cook. This, in turn, can increase dietary diversity and reduce the risk of infection.

Food transport and storage: Traditional cold storage technologies may not be viable in areas with limited reliable grid electricity. Biogas, by contrast, can be sustainably used for chilled storage to extend the shelf life of crops and other perishable goods. The initial cost of biogas-powered refrigeration remains high, but longer-term returns on this investment are positive – highlighting the importance of innovative financing from donors and governments to support local communities and businesses in these efforts.

Figure 1 Overview of the linkages between bioenergy and nutrition[a]



[a]Figure taken from Testa et al (2023)

Reflecting on a week of bioenergy learning

The summary above highlights key linkages between modern bioenergy and nutrition. In many cases, one supports the other and enhancing each has the potential to sustainably improve food security and subsequent nutritional status. This interdependence was also highlighted during the 10th edition of the Bioenergy Week, which took place in Bangkok on 24–27 October 2023.

The event was organised by FAO in the context of the GBEP, kindly hosted by the Government of Thailand, with the contribution of the United Nations Industrial Development Organization (UNIDO). The aim was to enhance the learning from positive experiences on sustainable production and use of bioenergy integrated within food production value chains, to support the design and implementation of bioenergy policies in Asia and the Pacific.

The GBEP Bioenergy Week brought together a large network of bioenergy stakeholders, including international experts, decision makers, and private sector representatives, to discuss current trends, future opportunities, and challenges. The Bioenergy Week successfully contributed to an exchange of learning on ways to improve agricultural productivity, enhance feedstock logistics, and increase the use of modern conversion technologies.

The work on energy-smart agrifood systems transformation evolves around three main pillars: (1) renewable energy for agriculture; (2) sustainable energy from agriculture; and (3) energy efficiency in agriculture. For this to happen, it is important to ensure coherence of policies and programmes with the common aim of achieving the 2030 Agenda for Sustainable Development.

Food, feed, fibre, fuel

Around 30% of all energy is consumed within agrifood systems, with 70% occurring in transport, processing, packaging, storage, and marketing.

Over the past 200 years, there has been a shift away from a natural economy – characterised by being land-intensive, low-tech, and renewable – towards a fossil economy, which is non-land intensive, high-tech but non-renewable. The emergence of the 'bioeconomy' provides great potential for renewable energy with moderately intensive land use. This requires both tech solutions and sustainable land management. Especially in the Global South, there is an increased need for mid-tech solutions that add value, are cross-cutting, and can be adapted in innovative ways to diverse contexts and needs. Policies must respond to 'polycrisis' through the engagement of all sectors – including agriculture, forestry, and fishery. This calls for a negotiated space that brings coherence across alternative visions for the bioeconomy.[2]

> *"The sector wastes around 38% of energy and approximately one-third of food is lost or wasted."*

Asia is experiencing a significant rise in both the supply and demand for bioenergy, driven by robust incentivising policies implemented in key countries within the region, such as India, Indonesia, Thailand, the Philippines, and Vietnam. There is a recognised role of bioenergy in meeting SDG 7 targets and many more.

Significant experience is available in using metrics assessing the contribution of bioenergy across several SDGs that are linked to environ-

Box 1 Bioenergy facts and figures

- Bioenergy is the largest source of renewable energy worldwide, with a share of around 10% of global primary energy supply (International Energy Agency (IEA), 2021).
- In the IEA 2°C scenario[1] bioenergy is expected to provide 17% of final energy demand in 2060 compared to 4.5% in 2015 (IEA, 2017).
- The role of bioenergy is recognised as key by the IPCC Report on Climate Change and Land (IPCC, 2019) for the 1.5°C objective, which requires substantial carbon capture and storage alongside emissions reductions.

[1] This scenario describes an energy system which is predicted to give an 80% chance of limiting global temperature increase to 2°C

[2] Presentation title: Bioenergy and bioeconomy pathways in the global South: resources, strategies and governance (Francis X. Johnson, Stockholm Environment Institute Asia)

mental, social, and economic dimensions of the sustainability of all forms of bioenergy. GBEP has developed the most widely recognised set of 24 voluntary sustainability indicators[3] for bioenergy, including validated indicators such as "life cycle greenhouse gas emissions", "biological diversity in the landscape", "price and supply of a national food basket", "capacity and flexibility of use of bioenergy", and "change in mortality and burden of disease attributable to indoor smoke".

Sustainable solid biofuels

Wood energy (including fuelwood and charcoal) holds immense importance in Asia and is projected to remain a crucial energy source. Notably, Vietnam emerged as one of the top five wood pellet exporters in 2020. In many countries, wood accounts for a substantial portion of energy demand, ranging from 20% to 80%. While the utilisation of wood fuel continues to increase, its growth rate is not as rapid as that of fossil fuels.

One session of the Bioenergy Week was dedicated to efficient management practices to produce feedstock and technologies for achieving environmental and climate targets. The use of bamboo as a potential bioenergy feedstock at household, large, and industrial scale was discussed in the context of China and India[4]. Key advantages of bamboo are that it does not compete with food and can be harvested on an annual basis – representing a sustainable source of energy. In Thailand, the cassava value chain, which employs 1 million farmers, has limited uptake as an edible food – therefore offering the greatest potential to produce cassava chips and pellet for fuel[5].

Both Indonesia and India are exploring different models to integrate bioenergy and food security at the landscape level. In Indonesia, the agroforestry model is based on the intercropping of the tamanu (*calopyllum inophyllum*) with maize, paddy, and peanuts for food production, including enhancing honeybee activity. In India, bamboo-based agroforestry has proved to be more commercially viable than single crops, especially for smallholders[6].

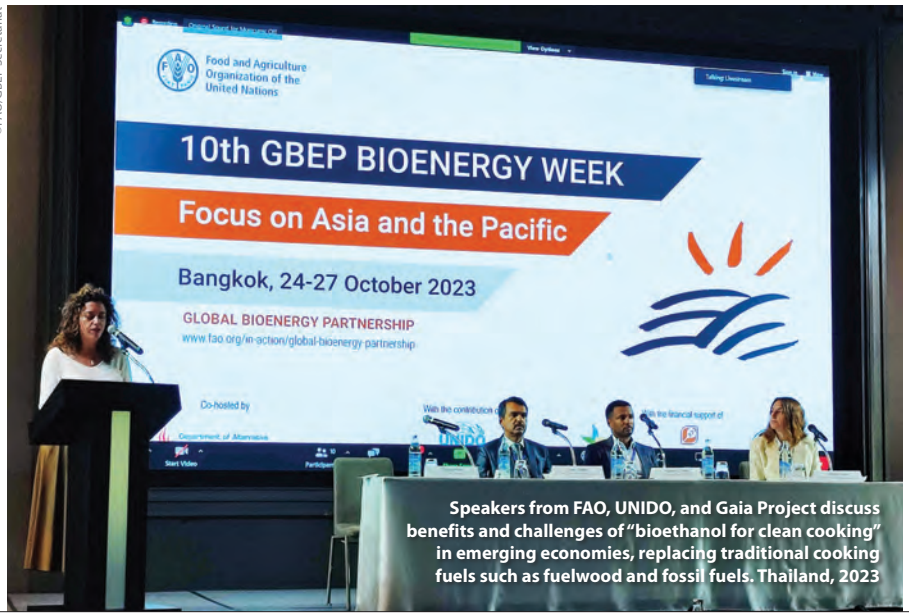
Given the huge demand for up to 35–50 million tonnes of biomass in India, the development of a market ecosystem with a 150–200 km radius is the suggested model to ensure sustainability through rural networked agriculture waste management (e.g., soybean husk or cotton stalk aggregation)[7].

The experience of improved cook stoves in rural India touches upon several aspects of interest along the bioenergy value chain – from the provision of fuel improved cook stoves, to the local production of improved biofuels, such as pellet from rice straws, to a campaign to ensure the sustainable uptake and use of improved cookstoves. The design of the improved cook stoves is done with a clear understanding of the needs of users, recognising the centrality of cooking as a dimension of individual and collective identity[8].

Sustainable gaseous and liquid biofuels

Within the Asia-Pacific region, there exists vast potential to produce biogas and biomethane on a global scale – owing to the abundance of suitable feedstock and the recent surge in consumption and imports of natural gas. China, Thailand, and India stand as the largest producers of biogas in the region. Notably, China has recently introduced policies aimed at encouraging the installation of household-scale digesters in rural areas, aiming to enhance access to modern energy sources and clean cooking fuels.

The production of liquid biofuels in the region is poised to surpass that of Europe by 2026, as projected by the IEA in 2021. Anticipated growth in demand amounts to approximately 10.8 billion litres per year (between 2021 and 2026). Indonesia currently holds the highest biodiesel blending mandate globally, set at 35%. Moreover, India, which aims to achieve a 20% ethanol blending target by 2022, recently established the Global Biofuel Alliance during its G20 presidency.



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Speakers from FAO, UNIDO, and Gaia Project discuss benefits and challenges of "bioethanol for clean cooking" in emerging economies, replacing traditional cooking fuels such as fuelwood and fossil fuels. Thailand, 2023

The Bioenergy Week was also an opportunity to discuss progress in Africa, including the ongoing effort to scale up ethanol clean cooking[9] and ensuring safety standards and regulations to increase uptake and adaptation in different contexts[10].

In summary

With the 2030 timeline for the SDGs rapidly approaching, the 10th Bioenergy Week provided an opportunity to discuss important, transformational issues that are at play within the broader nutrition, food security, and energy ecosystem. Both the literature review and our reflections from the conference highlight a myriad of opportunities that can be leveraged by focusing on the benefits that bioenergy can bring.

Interconnected challenges with food, feed, fibre, and fuel call for integrated approaches that bring together dimensions of biotechnology, bio-resources, and bio-ecology. Researchers, practitioners, and policymakers should look beyond traditional, siloed approaches to each of these areas – instead pursuing a multisectoral approach that encourages collaborative endeavour. The inclusion of SDG 2 (end hunger, achieve food security and improved nutrition, and promote sustainable agriculture) in this negotiated space would add a clear human dimension to policy dialogues, removing barriers and enhancing enablers.

For more information, please contact Patrizia Fracassi at **Patrizia.Fracassi@fao.org**

[3] **https://www.globalbioenergy.org/programmeofwork/task-force-on-sustainability/gbep-report-on-sustainability-indicators-for-bioenergy/en/**

[4] Presentation title: Bamboo – a potential bioenergy feedstock at household, large and industrial scale: experiences from China and India (Jayaraman Durai, Director, Global Programmes, INBAR, China)

[5] Presentation title: Bioeconomy innovations in Thailand (Warinthorn Sangkhasiri, National Center for Genetic Engineering and Biotechnology, Thailand)

[6] Presentation title: Integrating bioenergy and food security at landscape level (Yustina Artati, CIFOR-ICRAF)

[7] Presentation title: Revitalizing biomass resources: strategies for enhancing supply and sustainability (Jitesh Kumar, GIZ, India)

[8] Presentation title: Improved cookstoves in India (Ketaki Kokil. Ecosense Appliances Pvt Ltd, India)

[9] Presentation title: Scaling ethanol clean cooking through Council on Ethanol Clean Cooking (CECC) (Jossy Thomas, Bioenergy Programme, UNIDO)

[10] Presentation title: Safety standards and regulations for bioethanol for clean cooking: lessons from Africa (Wubshet T. Tadele, Gaia Clean Energy, Ethiopia)

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Views

MAMI and the 2023 WHO recommendations: We're talking the same talk!

Marie McGrath
Technical Director at Emergency Nutrition Network (ENN) and Co-Chair of the MAMI Global Network

What we know:

The World Health Organization (WHO) severe wasting guideline update in 2013 recommended outpatient treatment for infants under six months. The MAMI Care Pathway approach was developed to help operationalise this recommendation.

What this adds:

This article reiterates a blog Marie McGrath posted on 18 September 2023[1] commenting on the much-anticipated 2023 WHO guideline on the prevention and management of wasting and nutritional oedema (acute malnutrition) in infants and children under five years – which has finally landed[2]. Key principles and practices for continuity of quality care for small and nutritionally at-risk infants under six months and their mothers, described in the MAMI Care Pathway approach, are embedded in the 2023 guideline.

Many of you have asked whether the MAMI approach is reflected in the recently launched 2023 WHO guideline on the prevention and management of wasting and nutritional oedema (acute malnutrition) in infants and children under five years[3]. To answer, it may help to first clarify exactly what 'MAMI' is (and is not). MAMI refers to continuity of respectful quality care for at-risk infants under six months and their mothers across systems of health and nutrition. You don't need to call it MAMI but we've found it a useful shorthand for a big (but important) mouthful. 'At-risk' infants come in different shapes and forms, or at least are described in different ways. They may present as small vulnerable newborns[4], including those of low birth weight, who are premature, or small for gestational age, or wasted/stunted/underweight infants or infants otherwise at risk of poor growth and development. Risks may also arise due to maternal health, nutrition, or social factors that warrant attention and action. The 'MAMI Care Pathway' applies an integrated care pathway approach to the context of at-risk mother–infant pairs.

The 'MAMI Care Pathway Package' is a resource that was collaboratively developed under the MAMI Global Network[5] to help put this approach into practice to guide context-specific implementation (MAMI Global Network et al, 2021). It applies and expands on material that already exists – such as the Integrated Management of Childhood Illness (IMCI)[6] and breastfeeding counselling materials – that could plausibly be applied to improve the care of these vulnerable pairs.

Rest assured, the MAMI Care Pathway and WHO 2023 recommendations are aligned. Just like the MAMI approach, WHO has expanded the scope to way beyond the severely wasted infant under six months (the target group of the WHO 2013 guidelines[7]) to infants under six months 'at risk of poor growth and development.'

Expanded criteria to identify those at risk include weight-for-age, mid-upper arm circumference (MUAC) and growth faltering, and maternal factors. This welcome clarification on how to define those at-risk infants under six months of age helps address a critical longstanding gap highlighted in earlier published summaries of research priorities (Angood et al, 2015).

WHO 2023 emphasises and addresses mothers and infants' health and nutrition needs, as an interdependent pair, as does MAMI. The MAMI Care Pathway embeds and builds on IMCI, just as WHO 2023 does; in fact, WHO 2023 expands considerably on details of clinical care that hopefully can (and really should) feed directly into the WHO-led update of IMCI now well underway. WHO 2023 also provides guidance to support decision-making on referral pathways (continuity of care in action) informed by the individual mother–infant circumstances (person-centred care in action) and prevailing inpatient and outpatient service capacities.

In both MAMI and WHO 2023, prevention and treatment are intertwined through early identification and action, responsive growth monitoring, and attending to both maternal mental health and early child development.

"Does it matter that MAMI is not explicitly mentioned in the WHO 2023 guideline? NO"

What is important is what you do, not what you call it. Indeed, a drawback of our framing MAMI as a 'package' is that it can be seen as a standalone, rigid, or non-negotiable way to do care – which it's not. Implementation modalities for MAMI are not limited to those that explicitly use the MAMI Care Pathway Package and approaches. To achieve continuity of respectful quality care this may come in many different guises, and we should and must welcome, be open to, and embrace such diversity.

When it comes to the nitty-gritty details, there are some differences between WHO 2023 and MAMI. Take MUAC for example. The WHO guidelines include, for the first time, a welcome recommendation for MUAC (<110mm) in infants from six weeks to six months based on the latest evidence presented. The MAMI Care Pathway Package suggests a less conservative cut-off: <115mm for infants aged six weeks and above and <110mm for infants aged under six weeks.

Differences are only to be expected when you consider the different timelines, processes, remits, and authorities involved in normative guideline and implementation/operational guidance development. For the WHO guideline update, the independent WHO Guideline Development Group considered the latest evidence identified through systematic reviews and were informed by an appraisal of the balance of good practices (in case evidence was absent or very weak), benefits and harms, values and preferences, certainty, resources, equity, acceptability, and feasibility.

In the MAMI Care Pathway Package, MUAC cut-offs were proposed in the context of a lack of global guidance and an urgent demand from practitioners for direction. An expert/peer consultation, facilitated by ENN, considered evidence available up to 2021 (the last update), implementation experiences, and pragmatic operational considerations. Implementation guidance often can and needs to go further than normative guidelines, such as when there is a need to 'stop gap' an immediate void in global guidance that is hampering practice. Indeed, by going further to address urgent needs in real time, and documenting process and outcomes along the way, such guidance can support 'learning by doing' and generate evidence that can in turn inform normative guideline development.

1 https://www.ennonline.net/mediahub/blog/mami-and-the-new-2023-who-recommendations-on-at-risk-infants-under-6-months
2 https://www.childwasting.org/normative-guidance
3 https://www.childwasting.org/normative-guidance
4 https://www.ennonline.net/mediahub/blog/mamireflectionsonthelancetsmallandvulnerablenewbornsseries
5 https://www.ennonline.net/ourwork/research/mami
6 https://www.who.int/teams/maternal-newborn-child-adolescent-health-and-ageing/child-health/integrated-management-of-childhood-illness
7 https://www.who.int/publications/i/item/9789241506328

Considering the WHO 2023 recommendations, we'll be critically examining the specific 'technical' consistencies and differences between MAMI approaches and the WHO recommendations – better aligning where we can, and explaining where we are not (or not yet).

While keeping this in mind, let's not get too hung up on technicalities but rather seek to capitalise on the wonderful opportunities this guideline presents. The release of the WHO 2023 guideline truly marks an exciting phase of MAMI (or whatever you want to call it).

Our many years of groundwork on MAMI means we are now primed to help support national WHO guideline uptake (if wanted and needed), to achieve continuity of respectful, quality care for at-risk mother–infant pairs, and to learn from that process. If it helps, be guided by our framing of MAMI, but do not let it limit how you see it, or how you do it, or how you interpret what others do.

As highlighted in the WHO 2023, there remains a dearth of direct evidence of not only what works but how, for whom, and under what circumstances. Context makes and shapes everything – the 'how' of MAMI will and should be different wherever you are as realities are diverse. Embrace the rich tapestry of life in your evidence generation – at ENN, we're planning to do so through three deep-dive case studies on MAMI care from Yemen, Pakistan, and South Sudan.

We're happy to share our approach to help others do the same and would love to join forces to learn together. The WHO 2023 will be managed as dynamic 'living guidelines' – let's walk that walk together.

The MAMI/WHO 2023 alignment is no accident. The MAMI Care Pathway Package was first developed in 2014 to fill a guidance void on how to put the (then) ground-breaking 2013 WHO recommendation for outpatient care of 'uncomplicated' severely wasted infants under six months into practice. Evidence generation and strategic policy brokerage since, by so many members of the MAMI Global Network, has been instrumental in informing the WHO 2023 content.

From where I am sitting, the WHO 2023 guideline is not just an evolution but a revolution in care! Your collective work and gentle unfailing determination to build evidence and raise attention of at-risk infants under six months and their mothers has been instrumental in achieving this.

A huge thanks to all of you who have contributed and continue to make this happen.

If you'd like to talk about our case studies approach, share yours, or have any other thoughts, questions, and/or suggestions, drop us a line at: **mami@ennonline.net**

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Views

Maternal and child nutrition: **Findings from inception studies in Malawi**

©Save the children

Esther with her son, Blessings, 16 months, Northern Malawi

Brenda Phiri Project Manager at Save the Children International, Malawi

Natalie Roschnik Senior Nutrition Advisor at Save the Children UK

Phindile Lupafya Senior Health and Nutrition Advisor at Save the Children International, Malawi

Shelagh Possmayer Gender Advisor at Save the Children UK

Jean Nkhonjera Early Childhood Development Advisor at Save the Children International, Malawi

Olita Mulewa Maziko Field Coordinator at Save the Children International, Malawi

Takondwa Minjale Maziko Field Coordinator at Save the Children International, Malawi

What we know:

Malawi has a primarily rural population susceptible to climate shocks, which are a key driver of malnutrition. Maziko is a five-year integrated Maternal and Child Grant research project targeting mothers and children under five years in eight traditional authorities in Balaka and Ntcheu districts.

What this adds:

This two-part article first highlights the findings from Maziko inception studies, which indicate the current nutritional situation in the selected districts, before exploring beyond these statistics by looking at the context, opportunities, and surprise findings which were observed. High levels of poverty, food insecurity, climate vulnerability, and poor access to health/nutrition services were observed, but maternal mental health was also found to affect maternal and child nutrition.

Maziko[1] is one of Save the Children's flagship cash "plus" for nutrition projects – combining maternal and child cash transfers with a package of government endorsed multi-sectoral ("plus") interventions – to address the main drivers of poor nutrition and child development in Balaka and Ntcheu districts of Malawi.

Maziko is unique. First, because the "plus" component is multi-sectoral, combining a nutrition focused community outreach and behaviour change intervention with nutrition sensitive livelihood, food security and gender transformative components. Many cash plus for nutrition interventions tend to focus only on nutrition education/communication. Second, Maziko aims to improve not just child nutrition but also child development, by addressing ALL the main drivers of each and facilitate a successful transition between nutrition service delivery platforms and Community Based Child Care Centers. Third,

[1] https://resourcecentre.savethechildren.net/document/maziko-malawi-integrated-maternal-and-child-grant-project/

Maziko has a large mixed methods research component which generates evidence on impact and cost effectiveness of the cash plus approach, as well as the drivers of change.

Findings from the first-year inception period of the Maziko have been published[2] and are summarised here. The inception period included a baseline quantitative survey of 2,686 households across 262 villages, a detailed qualitative (immersion) study of 12 households, a district capacity assessment to identify bottlenecks in service provision for nutrition and early child development, and a cost of the diet study to determine the affordability of a nutritious diet. A detailed breakdown of the methodology and full results is beyond the scope of this summary but can be seen in the original report.

Baseline findings showed that the burden of malnutrition for children under two years was high: Stunting prevalence was 31%, underweight was 8%, and wasting was 1.4%. Exclusive breastfeeding rates were high (77%), although qualitative findings indicate that the early introduction of liquids and food may be more common than reported. Bottle feeding, a common entry point for enteric infections, was uncommon (1%) but poor hygiene practices including limited use of soap for handwashing, unsafe disposal of babies faeces and contamination of domestic areas with animal faeces were widespread.

Dietary diversity is also generally poor, with family meals consisting of maize, with over boiled green leaves. Although 85% of children were reported to continue breastfeeding up to 23 months, in line with World Health Organization recommendations, only 16% of children aged under two years achieved minimum dietary diversity and 49% were fed frequently enough. Only 1 in every 10 children consumed an adequate diet for their age.

Food security is a concern in the project area. Climate shocks are prevalent and there is a general lack of safety nets to rely upon when shocks occur – due to limited funding, poor coordination, high staff turnover, and inadequate use of data. Social assistance, both cash-based and in-kind, are limited. The cost of a nutritious diet, which increased by 25% between April 2021 and May 2022, increases vulnerability in the population – where household food expenditure accounted for 55% of total expenditures.

Due to the diversity and array of challenges present, the inception findings highlight the need for a multi-sector approach. The initial report does highlight Malawi's success with multi-sectoral policy, as strong policies and strategies do exist. Yet, policy implementation is affected by resource and coordination constraints.

Looking beyond the headline statistics

The Maziko project comes at a key time for the government of Malawi, as they develop their nutrition sensitive social protection system. Malawi's current national social support programme only reaches 2% of mothers and children under two years. We hope that this project will generate the evidence needed to demonstrate the relevance of categorical targeting and support advocacy for the expansion of the national social support programme to target mothers and young children in the first 1,000 days.

The project inception period and studies summarised above were extremely valuable as they helped us to identify the key drivers of malnutrition and poor child development. They reinforced the need for a multi-sectoral package of interventions – targeting mothers and young children from conception.

Unexpected learnings

Some of the research findings were expected (e.g., high levels of poverty, food insecurity, climate vulnerability, and poor access to health/nutrition services). However, the findings that surprised us most were around women's mental health and wellbeing. Specifically, how this affected their own and their children's health, growth, and wellbeing. The quantitative (baseline survey) found that 26% of women reported depressive symptoms (using a self-reporting questionnaire questionnaire). Symptoms included feeling tired all the time (39%), feeling tense or worried (42%), or having trouble thinking clearly (24%). At the extreme end, 7% of women reported having suicidal thoughts.

> *85% of households had experienced loss of crops due to droughts or floods in the previous 12 months*

Qualitative research proved especially insightful. This was "immersion" research, whereby researchers (Save the Children and government staff, trained by Empatika[3]) lived in households for four days and four nights, gathering evidence by living women's lives. The detailed immersion report[4] presents a sobering read, showing that women are overwhelmed with chores and childcare. They feel stressed, undervalued, and have no time to care for themselves – which affects their milk production and childcare. Fathers were either absent or disengaged and children were often left to their own devices.

The surveys also looked at childcare practices across the nurturing care framework[5] and found that childcare was primarily seen as the mother's responsibility. This led to limited and basic care, with very little extra and intentional play and stimulation as mothers are too tired and overstretched. The quantitative survey included family care indicators which found that children have limited or no access to toys or books (21% have homemade toys and only 2% have books). Furthermore, around 40% of women reported playing or singing songs with their children within the previous three days.

Targeting the gaps

These findings highlight gaps within the government of Malawi's main nutrition outreach system and social and behaviour change curriculum (the Care Group and Scaling Up Nutrition community counselling package[6]). We needed to fill these gaps to ensure the project's cash "plus" package addressed the main drivers of malnutrition and poor child development at community level.

Whilst the Care Group approach and curriculum is very comprehensive, it primarily targets women, and doesn't focus on maternal mental health and wellbeing. To address this, the Department of Nutrition and HIV/AIDS, with UNICEF, adapted UNICEF's Caring for the Caregiver[7] approach to the Malawi context. Save the Children then integrated this into the Maziko "plus" package. We also adapted Save the Children's 'Male Champions' approach to engage men to become more supportive and engaged fathers and husbands.

The value of a combined package

One of the main challenges with multi-sectoral programming is that it can be both costly and overwhelming – with too many issues needing to be addressed at the same time. Whilst the inception studies (summarised above) confirm the need for a multi-sector approach to address a multitude of challenges, they also identify priority drivers that could reduce the potential impact of cash transfers and other "plus" interventions. These drivers (women's poor mental health and wellbeing being the most important one), will hopefully be improved through the combination of interventions: Cash transfers, regular home visits (with frontline volunteers trained in the Caring for the Caregiver approach), and more engaged fathers and husbands. Small, achievable behaviours were also identified through a people driven design exercise (led by Empatika), to prioritise and adapt behaviours to promote through the Care Group system.

We would like to thank our donors (Power of Nutrition; their back donors, the Conrad Hilton Foundation; the United Kingdom Foreign, Commonwealth and Development Office; and Irish Aid) who have provided the flexibility to adapt and improve this intervention package. We would also like to thank our partners, IFPRI (leading the research component); Give Directly (leading on the cash component); Empatika (who designed and trained our staff to conduct the immersion and people driven design work); our district partners, representing every sector leading the implementation of these interventions; and our Save the Children Maziko staff.

These partners, working alongside the Government of Malawi, showcase the value added by comprehensive, multisectoral collaboration – without which these initial findings and the development of the broader project would not have been possible. These efforts should be applauded, as this is not always the norm. We believe that this combined package can be truly transformational, and we look forward to sharing more findings from this project moving forward.

For more information, please contact Natalie Roschnik at n.roschnik@savethechildren.org.uk

[2] https://resourcecentre.savethechildren.net/pdf/Maziko_InceptionFindings_3.3.pdf/
[3] https://www.empatika.org/
[4] https://resourcecentre.savethechildren.net/document/caregiving-behaviours-for-nutrition-and-child-development-in-malawi-maziko-formative-research-findings/
[5] https://nurturing-care.org/
[6] https://scalingupnutrition.org/resource-library/toolkits-tools/malawi-sun-1000-special-days-community-counselling-package
[7] https://agora.unicef.org/course/info.php?id=25325

Local market in Long District. Laos, 2020

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Caregivers' perceptions of children's diet and development in northern Laos

Sophie-Anne Sauvegrain
Anthropologist at Nutriset, France

Didier Bertrand
Independent Researcher in Cultural Psychology in Laos

Monique Chan-Huot
Director of Innovation at Groupe Nutriset, France

Vanphanom Sychareun
Public Health Professor at the University of Sciences and Health in Vientiane, Laos

Phonevilay Santisouk
Senior Lecturer at the University of Sciences and Health in Vientiane, Laos

Vilamon Chanthaluesay
Teaching Associate at the University of Sciences and Health in Vientiane, Laos

This study was funded by Nutriset Group, a developer and supplier of therapeutic solutions to the World Food Programme (WFP). It does not discuss the impact of products received by beneficiaries, nor does it promote any Nutriset products or commercial interests. Its social and anthropological approach to determine perceptions of child development aims to build on existing knowledge. The authors declare no conflict of interest in the publication of this article.

What we know:

Food insecurity and malnutrition are widespread among ethnic minorities from northern Laos. In response, humanitarian assistance, in the form of specialised nutrition supplements, was provided to support this group.

What this adds:

This study highlights the importance of natural food in both its symbolic and nutritional dimensions. The authors recommend adopting a comprehensive approach that includes anthropological considerations when setting up nutrition interventions and to define strategies that are adapted to individual contexts, cultures, and social relations.

Background and introduction

This study was carried out in Luang Namtha Province in the mountainous region of northern Laos. Luang Namtha is populated by ethnic minorities from four main ethnolinguistic[1] groups that share common animist beliefs. Most of these villages' inhabitants have been displaced due to conflict or the Government's internal displacement programmes. Their livelihoods depend on a subsistence economy based on agriculture (with rice a staple crop) and livestock breeding, as well as the gathering of edible plants in forest environments, hunting, fishing, or gathering other wild foods. Coping strategies, such as self-sufficiency and then the sharing of food in villages where bartering is common, provide additional local plant and animal foods to the diet.

In this area, the national demographic and health survey (Lao PDR, 2012) identified in 2011 a high rate of stunting for children under five years (53.2%) and worrying levels of wasting (21.2%) and severe wasting (9.2%). This led the WFP to initiate a Mother and Child Health and Nutrition programme, which included the provision of nutrition supplements between 2012 and 2015 to support the nutrition of pregnant and lactating women, as well as infants and young children in their first 24 months (the '1,000 days' period) (WFP, 2016).

The researchers chose this province to interview caregivers, particularly mothers, to understand and hear them describe their feelings and perceptions regarding child nutrition and development. It is important to note that, although the research was conducted in the same area, this study is not an evaluation of the programme implemented by WFP.

Methodology

This research project stems from a tripartite public–private collaboration established from late 2019 to mid-2021 between an independent human science researcher, the Faculty of Public Health at the University of Health Sciences in Vientiane (Laos), and the Nutriset Group.[2]

A bibliographical research phase was first carried out to inform the design of the research project and to develop the research questions. The interview guide was then compiled and pre-tested. In June 2020, the study protocol received research authorisation from the Ethics Committee of the University of Health Sciences.

In December 2020, three researchers[3] conducted data collection in six villages[4] of Luang

[1] The four ethnolinguistic groups are the Akha, the Lahu, the Khmu, and the Lamet.
[2] Nutriset is a private actor in the response to malnutrition.
[3] Two Lao women and a French man.
[4] The six villages covered in this study are Huaythumay, Phothorkao, Phonesamphan, Phoulet, Donemay, and Namsieu.

Table 1 Key informants

Village, district	Huaythumay, Long		Phothorkao, Long		Phonesamphan, Long		Phoulet, Vieng Phouka		Donemay, Vieng Phouka		Namsieu, Vieng Phouka		Total
Ethnic group	Akha		Lahu (Kui)		Lahu (Kui), Tai Lue, Kmhu, Tai Dam		Khmu		Khmu (Youn), Lahu, Museu (Lamet)		Khmu		
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	
Parents	3	1	3	1	3	0	3	1	6	0	5	0	**26**
Grandparents	1	0	1	0	1	1	2	4	1	1	1	1	**14**
Focus group discussion (mothers and fathers)	5	3	3	3	4	4	5	0	5	5	5	5	**47**
Focus group discussion (village committees)	1	4	0	5	0	1	1	2	0	2	2	1	**19**
Village authorities	0	0	2	0	2	0	1	0	0	0	2	1	**8**
Subtotal	10	8	9	9	10	6	12	7	12	8	15	8	**114**
Government health service staff	5 women; 2 men												**7**
Total													**121**

Namtha Province using semi-structured interviews (individual or focus group discussions). They employed an interview guide containing 55 questions covering eight themes, including maternal nutrition and child nutrition and development.

Interviews were carried out with 121 key informants directly or indirectly involved in childcare when the WFP programme was implemented[5] (Table 1). The majority (87 people – 57 women and 30 men) were parents or grandparents responsible for childcare and had an influence on children's diets. A further 27 people were considered village authorities (village health volunteers, traditional midwives, members of the Lao Women's Union, and healers) and seven people were government health service staff. The sampling frame consisted of villages. Researchers attempted to ensure the representation of different ethnic groups in multi-ethnic villages.

Individual interviews and focus group discussions aimed to create an interactive dynamic to allow for more spontaneous data collection. Interviews were either conducted in Lao or through a translator in non-Lao-speaking villages.

The verbatim reports collected were then analysed and grouped by themes under the categories 'nutrition for pregnant and lactating women and their newborns' and 'nutrition for children and their development'.

The data collected considers the concept of a healthy child from the perspective of nutrition and development. Although in practice the data covered more topics, the findings reported here are limited to the main features of child nutrition and the description of 'good' child development.

Findings

Main characteristics of child nutrition in northern Laos

The interviews revealed that, according to ancestral wisdom, breastfeeding should continue until the child is walking and they can start eating solid foods when teeth appear. Complementary feeding begins with rice, which has a strong symbolic and religious significance: rice is considered *"good for children; it gives them energy and makes them strong".*[6]

Animal and plant foods, sourced directly from nature, were associated with multiple benefits, such as 'giving strength'. Food of natural origin was contrasted with that produced by intensive agriculture or agroindustry.

> ***"I want him to have as much fruit and natural produce as possible, as well as meat from wild animals"***
>
> – Extract from an interview with a Lamet mother, regarding her son

Dietary diversity was seen as essential, although putting it into practice in meal preparation depended on the availability of cultivated and/or harvested foods.[7] It also appeared that the attention paid to a child's eating habits decreased as the child got older.

Children and their development

In response to the question "How would you describe a well-developed child?", most terms used related to ***physical appearance:*** the child was referred to as 'big' or 'strong'[8] or even 'fat' or 'brawny'. Fatness (even being overweight) was considered a sign of health and wellbeing, while strength was considered a key quality in mountain environments.

> ***"His skin is not wrinkled", "the child is beautiful", "he has a lot of hair"***
>
> – Assorted aesthetic terms used to describe children during interviews

The ***'complete' child*** was often described as the opposite of the malnourished child. In the 'Lessons learned' section, we consider the notions of the 'well-developed' and the 'complete' child.

A few key informants referred to a child's ***behaviour:*** two mothers mentioned a child's good temperament and the fact that he did not cry. The child's physical abilities, such as 'walking for a long time', 'running', or 'jumping a long way', were also mentioned.

In the Lahu village, one father mentioned the child's ***socialisation*** and tendency to play with others rather than remaining alone. Two mothers referred to a child's good character, good mood, and the fact that they did not cry.

In terms of ***school education***, only five respondents (notably men from Khmu villages) cited the child's intellectual faculties, describing a well-developed child as having a 'good brain' and studying well.

Discussion and lessons learned

Analysis of findings

This study questioned the perception of child development through a comprehensive anthropological approach that integrates the fact that food contributes to the social and biological construction of the child (Bouima, 2021), rather than through the more traditional prism of anthropometry or that of universal 'international standards.' UNICEF, for instance, created the Early Childhood Development Index (Lao PDR, 2012)[9] and Forssman et al (2017) developed a method for assessing cognitive development independent of the child's economic, cultural, or educational background. The existing tools are

[5] Children were aged between six months and two years during programme implementation (2012–2015), which means they were aged 5–10 years during data collection.

[6] Mothers used to chew rice before feeding it to their children until hygiene campaigns discouraged this practice.

[7] Examples of foods from a diversified diet: cereals (rice, corn), meat (pork, squirrel, duck, chicken), fish, eggs, vegetables (taro, cassava, green vegetables, gourds, etc.) and fruit (palm fruit, pineapple, bananas, rambutan, oranges, apples, etc.).

[8] The term 'strong' refers to both physical strength and the bodily form.

[9] The Early Childhood Development Index is made up of four domains: literacy/numeracy, physical development, social-emotional development, and learning.

essentially based on psychological or motor examinations of the child.

This study took a different angle and approached child development by collecting and analysing the verbatim accounts of people closest to the child. This study sought to identify new forms of qualitative 'indicators' to describe a child's development. Certain aspects of the perception of potential links between nutrition and child development were explored, with an awareness of the multi-dimensionality of child development – particularly the importance of its emotional and spiritual aspects.

Lessons learned

This study measured the complexity of tackling child development through semantics and the importance of 'speaking the same language' beyond translation. For example, it became clear that the term 'development' was mostly understood as infrastructure development.

In the Lao language, a 'complete' or 'well-developed' child is referred to using the term 'somboon'. This term comes from 'Sampurna' in Sanskrit, which refers to a form of fullness or abundance, which can be literally translated as 'complete' or 'fulfilled' when referring to a child. We noticed that this term, which appeared in the pre-survey, is used in some of the other languages of ethnic groups included in the study.

The interviewees were unfamiliar with the very concept of 'child development', as the elements of children's development are not perceived as connected or evolving in a linear way in the North Lao way of thinking. However, parents could account for what makes a child beautiful or admirable (skin, weight, height, alertness or intelligence, ability to reproduce social cues and socialise, and good health) and to what extent food contributes to this. Use of the local term 'somboon' seemed key to tackling this subject.

This study has shown how parents, driven by the desire to have a 'complete' child, used various food coping strategies in a context of relative precariousness and food insecurity. Certain foods, such as those gathered direct from nature, particularly the forest, had a strong emotional or symbolic significance, reflecting a form of symbiosis between these populations and their environments.

Study limitations

The study did not address the specific culture and beliefs of each of the four ethnolinguistic groups,[10] which could have been sensitive in this ethnic minority context.

Based on Natacha Collomb's (2010 and 2011) work in northern Laos, the researchers were interested in exploring the role and importance of the heart and emotions in children's learning and development,[11] but this would have been a wider undertaking.

Key barriers

Access to villages was difficult, as some roads had been blocked during the rainy season. Periods of restricted mobility due to the COVID-19 pandemic in 2020 also delayed data collection.

Another barrier was the lack of the researchers' knowledge of local languages, necessitating the presence of a non-professional translator from the community. In addition, some mothers expressed shyness or embarrassment during interviews. Finally, the fact that the study's lead researcher was a man of foreign nationality may have constituted a bias during the interviews, even though he was accompanied by two Lao women.

Conclusion

In a relatively isolated, food-insecure rural context, this study attempted to provide some insights into parents' understanding of children's growth and development in relation to their diet. The displaced populations in Luang Namtha refer to ancestral knowledge of a diet based on diversified foods of natural origin, which is good for children. The parents also described the characteristics of a well-developed child as 'somboon', a term that represents the child's growth, healthy development, strength, and good health – qualities that seem necessary in forest and mountain environments. Aesthetic features of their face and skin were also highlighted, as were their socialisation and schooling.

These findings confirm the need to take a holistic approach to child development. According to Shonkoff and Philips (2000), physical growth, literacy and numeracy, social and emotional development, and willingness to learn are vital areas of a child's comprehensive development. Collomb's work focuses not only on cognition and brain development, but also on other aspects of emotional and social development. It also seems important to explore the contribution of the spiritual dimension to human fulfilment, here in the context of animist societies.

From our findings, we recommend adopting a comprehensive approach with anthropological considerations when setting up nutrition intervention programmes, with a view to defining strategies that are adapted to the specificities of individual contexts, cultures, and social relations. This study has highlighted the importance of natural food according to both its symbolic and nutritional qualities, which cannot be overlooked when implementing nutritional programmes or offering nutritional solutions.

For more information, please contact Sophie-Anne Sauvegrain at **sasauvegrain@nutriset-dev.fr**

[10] The Akha, the Lahu, the Khmu, and the Lamet.

[11] For the Tai Dam people, beyond the role of the heart in learning, the heart's feeling is also traditionally used to identify which foods are healthy and which are taboo.

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Researchers and key informant in Houey Thu Maï village, Long District. Laos, 2020

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Mother-Child Health centre in Hargeisa, Somaliland

Integrated Community Case Management 'Plus':

Treating closer to home in Somaliland

Yuusuf S Yuusuf
Research Coordinator Integrated Community Case Management Plus at Save the Children International, Somalia/Somaliland

Mohammed Ismail Mahamoud
Area Research, Evaluation, Accountability, Learning and Monitoring Manager at Save the Children International, Somalia/Somaliland

Said A Mohamoud
Research Advisor at Save the Children International, Somalia / Somaliland

Guleid Mahdi Mohamed
Integrated Community Case Management plus Coordinator at Save the Children International, Somalia/Somaliland

Saeed Mohamood Soleman
Senior Health Policy & Integrated Planning Specialist, Somaliland Ministry of Health Development

Lucas Nene
User Insights & Service Design Consultant at DesignHealth

Emily Keane
Senior Nutrition Advisor at Save the Children

What we know:

Integrated Community Case Management (iCCM) improves coverage and quality of care for sick children by training community health workers to diagnose, treat, and refer common childhood illnesses at the community level. Adapting the iCCM platform to include treatment of wasting shows promise.

What this adds:

The iCCM+ service prototype implemented in Somaliland, which focused on female health workers (FHWs), was encouraging – with findings indicating that common barriers to wasting treatment services can be reduced when provided as part of an iCCM package. 'User-centred' and 'service design' approaches provide great value, ensuring that services are effective by solving operational challenges as they arise.

Improving access

In Somaliland 1.4 million children under five years are wasted (Ministry of Planning and National Development, 2020). The iCCM platform screens for and refers children with wasting to local health facilities, but coverage and accessibility are often low. Rural communities lack consistent, cost-effective transport and caregivers must often find financial resources to access health facilities, often involving a day-long commitment away from the household. Inconsistent communications between health facilities and FHWs may also result in a wasted trip – such as in the event of a stock-out of treatment supplies. These challenges may then repeat over the duration of treatment until a child is discharged.

Adapting current iCCM platforms to provide wasting treatment alongside common illness treatment (named 'iCCM+') may offer a solution that improves access to these essential services.

This article documents the process and learnings of Save the Children's experience between 2022 and 2023. Save the Children worked with DesignHealth[1], Somaliland's Ministry of Health Development (MoHD), community members, and health workers to design and refine a service prototype for FHWs to treat uncomplicated wasting within iCCM.

Methodology

Save the Children has been implementing facility-level health and nutrition programmes in Somaliland since 1991 and community-based health services since 2017. In 2019, Save the Children started integrating iCCM and severe and moderate wasting treatment by FHWs. This was the first time iCCM+ was operationalised in Somaliland. We therefore undertook a process of adapting and contextualising protocols and tools that had been developed in other contexts (Marron, 2021) to develop an 'iCCM+ service prototype' that would enable low- literacy health workers to treat wasting in Somaliland (Box 1). For this process we utilised 'user-centred design', which is a phased approach to developing health services, user experiences, and products, in collaboration with DesignHealth. Each phase involved users throughout the design and development process, incorporating and building upon the evidence established in the previous phases. The service prototype used all five principles of service design: user-centredness, co-creation, efficient sequencing of events, evidencing design decisions, and a holistic approach

[1] DesignHealth is an agency specialising in user-centred design.

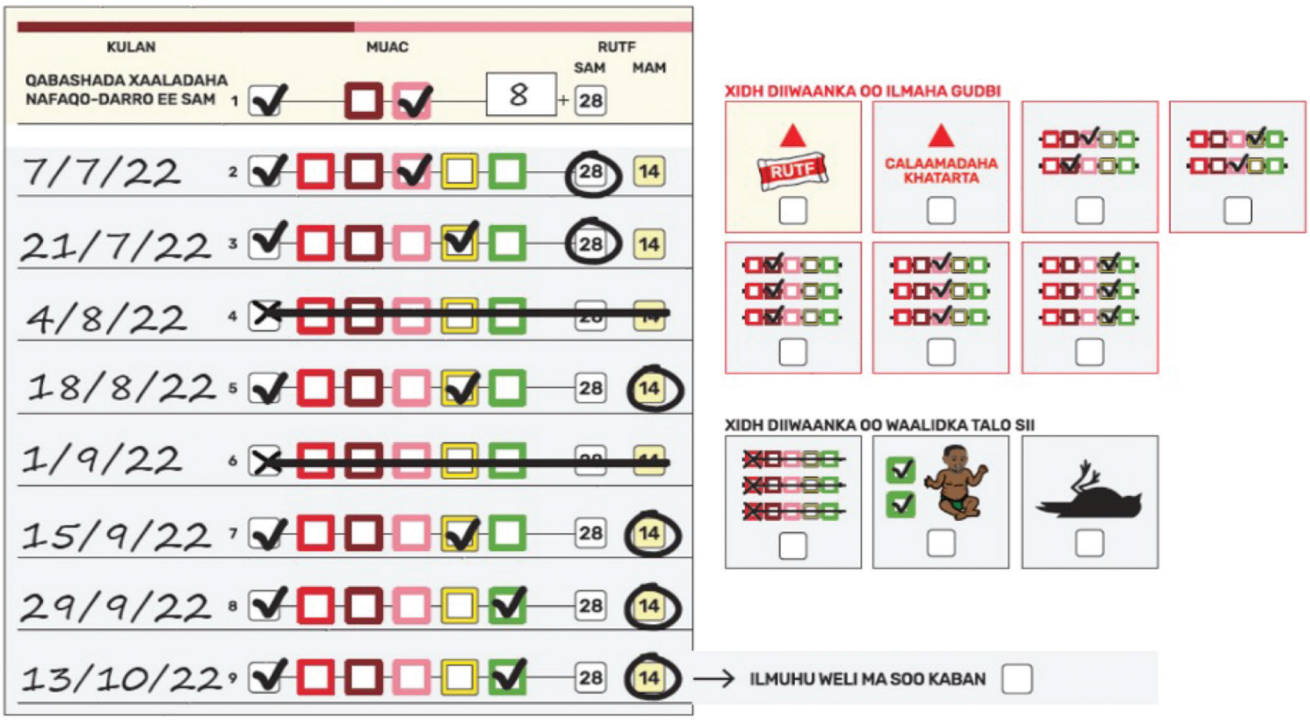
Box 1 Process

Development of the simplified iCCM+ tools progressed throughout 2019 and into 2020, including four field visits for testing and co-creation with Somaliland's FHWs. The complete suite of simplified tools was delivered in late March 2020. In response to COVID-19 treatment protocol amendments, DesignHealth was tasked with creating additional FHW and community COVID-19 awareness job aids. All content was translated into the Somaliland dialect of the Somali language by May 2021. Operational planning and service delivery design began in 2022.

The 'service prototype phase' ran between June 2022 and February 2023. The objective of this phase was to develop all the necessary protocols, reporting systems, and logistics to ensure that FHWs could efficiently implement an adapted treatment protocol for uncomplicated severe and moderate wasting – using their simplified tools, while providing their community-based caseloads with an uninterrupted supply of ready-to-use therapeutic food (RUTF).

This phase of work was also intended to validate a service approach that will be implemented at a larger scale as part of a research study (planned for the end of 2023) looking into the effectiveness of iCCM+ in improving wasting treatment coverage in a wider geographical area in Somaliland.

Figure 1 An example training scenario[2]



to stakeholder needs. The process facilitated rapid feedback and adaptations to be made as service delivery was ongoing.

The treatment approach and service continuum

The iCCM+ treatment protocol was developed by adapting traditional wasting treatment with the information gained from several rounds of user-centred design efforts. The protocol consisted of three steps (below) and FHWs were provided with monthly in-person support/training from MoHD supervisors.

Step 1

Screening at the child's home using a simplified mid upper arm circumference (MUAC) tape, checking for oedema and using the 'nutrition tally register', and assessing for danger signs. The simplified MUAC tape used existing measurement increments for severe and moderate wasting, but replaced the numbers and measurement increments with five colour-coded sections. These colour codes were featured throughout the suite of simplified tools – enabling low-literacy/numeracy cadres to effectively deliver iCCM+ services, thus expanding access.

Step 2

Admission, treatment, and counselling at the FHW's home (using malnutrition registers); providing routine medications and a modified biweekly RUTF dose for moderate or severe wasting (one or two sachets/day); and nutrition counselling. The FHW recorded key information about the child's assessment, treatment, and actions taken in a modified treatment register.

Step 3

Follow-ups occurred during weekly FHW visits to the child's household. Caregivers brought their children to the FHW's home every two weeks for an additional progress assessment. If the child did not show any danger signs, the caregiver continued to receive RUTF until the child was discharged or referred. Treatment registers (updated fortnightly) contained an additional pictorial register that supported the FHW to assess if the child's condition improved, stagnated, or declined. This continued until the child met the discharge criteria.

Data collection

Data collection for the iCCM+ service prototype used both qualitative and quantitative methods, with different stakeholders managing and executing different roles. DesignHealth was responsible for qualitative research design, data collector training, and leading any iterations to the service experience and iCCM+ tools. Save the Children was responsible for collecting quantitative health outcomes data and managing the development of Kobo Toolbox – a digital, tablet-based tool used for all data collection efforts. Save the Children and its partners at the MoHD also conducted monthly site visits during each home distribution day, during which they reviewed and interviewed FHWs and caregivers. DesignHealth provided remote support and guidance during the service prototype phase by facilitating monthly progress reviews with project implementors.

Service launch preparation

In preparation for the service prototype launch, DesignHealth developed a four-day in-person curriculum, instructional design, and training aids for the iCCM+ training of trainers. Heavy emphasis was placed on scenario-based training, requiring students to recognise visual patterns on the treatment register that indicated the child's progress toward recovery (Figure 1). Save the Children conducted community mobilisations in August 2022 to introduce the iCCM+ service prototype to each community.

Measuring tool performance

The iCCM+ tools enabled FHWs to process data and make decisions. FHW errors and omissions were categorised by DesignHealth using patient safety frameworks, with an explicit focus on errors with implications for the child and FHW's wellbeing.

Findings

Treatment outcomes

Although the main objective of the service prototype phase was not to assess the effectiveness of treatment delivered by FHWs – which will be investigated during the subsequent research phase – specific data related to the user experience, including on the access "journey" of community caregivers and the impact of the additional workload on the FHW, was collected and reviewed during the service prototype phase.

Across the five trained FHWs, 1,203 screenings for malnutrition were conducted during five months of implementation[3]. In total, 83 children were admitted for moderate wasting,

[2] Students were required to review the simulated register for documentation errors, and then select the appropriate closing icon.

[3] Screenings do not represent individual children as the same child may be measured multiple times.

with 38 recoveries and eight defaulters; four children were admitted for severe wasting, with two recoveries and two defaulters.

Tool performance

We observed that some of the modified MUAC tapes had issues with the coloured pigment scratching off after three months of use. This resulted from procuring a small batch of modified tapes that sought to balance costs. For the next phase of work, alternative MUAC tape suppliers will be identified with additional quality checks and sufficient contingency stock in place.

Other iCCM+ tools, such as registers, tally sheets, and job aids, did function as intended – having already been validated through previous usability testing by DesignHealth.

FHW errors

FHW errors that were observed (and corrected by Save the Children and MoHD during the home distribution day) included incorrect MUAC tape application, oedema checks, and delivery of counselling messages.

FHWs still struggled with omissions at various points of data entry. Arguably, the most serious cases involved incorrect documentation of the child's discharge status. While these issues were observed during the first two months of the service prototype, one instance of an omission of discharge data was observed by the end of the prototype phase. This suggests that monthly follow-up visits and on-site training may improve FHW compliance with the treatment protocol.

Stock management

During the five months of service prototyping, emergency resupply was only used once, in response to an influx of families into the study community due to the regional drought. The emergency resupply protocol maintained a buffer-stock of RUTF and pre-arranged systems to ensure delivery within two days of the FHW or supervisor's request, ensuring continuity of treatment until the next scheduled resupply.

Water access and use

iCCM+ protocols indicate the importance of having potable water available (for handwashing and drinking) when RUTF is provided to the child. In Somaliland, caregivers and FHWs face a myriad of water access challenges. At the time of the service delivery prototype, water, sanitation, and hygiene (WASH) had not yet been integrated into iCCM+. WASH integration was recommended by DesignHealth and is expected to have a variety of positive benefits, such as mitigating potential drivers of diarrhoea and the occasional caregiver perception that RUTF itself is to blame for their child's diarrhoea. The latter point, which was documented three times in separate communities, is worth noting as it resulted in a referral being refused because the RUTF (and therefore the FHW) was blamed for causing the diarrhoea.

Lessons learned

What worked well?

A key benefit to this approach is that caregivers experienced reduced transport time and costs when accessing iCCM+ services from the FHW's home compared to the health centre.

To increase adherence and acceptability, the home distribution day for RUTF was decided in consultation with caregivers and FHWs. Thursdays were chosen as this was reported to be the least busy day, with travel to the health centre and markets occurring earlier in the week.

Although FHWs reported a higher workload, due to the introduction of wasting treatment in addition to regular iCCM activities, they were willing to provide these additional services during the prototype phase and expressed satisfaction regarding their additional skills.

Overall, FHWs were directly observed to provide good quality treatment according to the iCCM+ protocol when provided appropriate training, tools, and consistent support and direction from supervisors and monthly field visits.

The supply chain system ensured that supplies were available to FHWs and caregivers in sufficient quantity to provide uninterrupted wasting treatment, during the service prototype.

What were the challenges?

Although FHWs were able to provide a good quality of care, there were errors in performing some functions, particularly after the initial introduction of iCCM+. However, errors gradually reduced over time. In future phases of implementation, supportive supervision will be intensified (ideally biweekly for the first three months of implementation), with refresher training every six months.

Caregivers reported challenges when they were referred for additional healthcare that could not be provided by the FHW, including costs and impacts to care for other children in the household. There is a need for further investigation of what additional support for caregivers to attend referrals is feasible within existing systems and resources, with the potential need for additional interventions.

FHWs reported additional water costs and the need for additional WASH infrastructure to deliver wasting treatment alongside iCCM services (e.g., water needed for the appetite test). In the next phase of implementation, support will be provided to FHWs to ensure they can provide safe water as a part of treatment. Limited WASH infrastructure was acknowledged by all project stakeholders and will be addressed for the research implementation phase in late 2023 / early 2024.

FHWs reported increased workload and personal costs for the delivery of services. Further work is required to evaluate FHW compensation and decisions should be responsive to the increased scope of work and personal expenses incurred by FHWs.

RUTF sachets remain critical for treating uncomplicated wasting. Unfortunately, they have become a financial commodity that can be reliably traded for goods, posing a challenge to programme budgets and health outcomes. Strong community engagement and consistent messaging about the purpose of iCCM+ and RUTF is required from all actors, alongside further exploration of the underlying causes of RUTF sachet exchange.

Limitations

While the service prototype was able to adapt to challenges, different problems may occur when such a service is rolled out at a wider scale, in other locations, for a longer period. Reporting bias, particularly related to FHWs' experience of additional workload and additional tasks, may have been present given that Save the Children and MoHD supervisors were serving as data collectors for the prototype, likely influencing FHW conclusions A neutral third party should survey participating FHWs to gain a more accurate and representative picture.

Conclusion

We recommend the use of 'user-centred service design' when initiating a novel service in a new location, which provides functional insights to address operational challenges as they arise.

Overall, the service prototype showed several benefits, including reducing the amount of time and resources that were required by caregivers to access care for their children. The simplified tools enabled FHWs to provide quality care when backed up with proper training and supportive supervision, and the supply system that was developed ensured that RUTF was available to FHWs and caregivers in a timely manner.

The next phase of the work will be the initiation of research evaluating the effectiveness of the iCCM+ approach through cluster randomised control trial, on a larger scale in Somaliland, using the tools and approaches that were validated through the service prototype. Save the Children is also planning to expand the approach into to other locations in Somalia, including those that are more conflict affected, and will try to understand if additional adaptations are required.

For more information, please contact Emily Keane at **e.keane@savethechildren.org.uk** and Yuusuf Siciid at **yuusuf.yuusuf@savethechildren.org**

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An Imam being interviewed by Dr Hawa Diarra as a part of the pilot study, Nara. Mali, 2022

Optimising 'Family MUAC':
Findings from a pilot study in Mali

Britt Titus
Behavioural Insights Lead at International Rescue Committee's (IRC) Airbel Impact Lab

Carla Pramila Lopez
Associate Director of Health Innovation and Design Practice Lead at IRC Airbel Impact Lab

Hawa Diarra
Public Health Doctor and PhD candidate in Maternal and Child Pathologies

What we know:

The use of mid-upper arm circumference (MUAC) tapes by trained family members ('Family MUAC') is increasingly used as the screening programme of choice by international organisations and many governments. A previous article (Lopez et al, 2022) investigated barriers to Family MUAC uptake and then prototyped a package of interventions to increase its use.

What this adds:

This follow-up pilot study sought to answer how the package performed in real-world conditions. All participant groups found the intervention to be supportive in screening children for malnutrition, with particular emphasis on the success of both a video testimonial and group screenings during local meetings.

The problem

Worldwide, only 20% of an estimated 50 million children afflicted by severe wasting receive life-saving treatment each year. The biggest gap to treatment coverage is identification of cases and referrals to treatment.

IRC Mali programmatic data has shown that caregivers are able to accurately use MUAC tapes. This has the potential to increase the cadre of screeners for wasting in children, which should lead to greater numbers of referrals for treatment. However, in the Nara region of Mali (where 90% of women were trained on MUAC use) only 20% of treatment admissions were referred by families.

In 2021–2022, we applied a user-centred, behavioural science-informed, problem-solving approach to understand drivers of low Family MUAC uptake in the Nara region of Mali, with the aim of developing a set of proposed solutions that are both desirable to caregivers and feasible to implement.

Identifying barriers and solutions

Identification of barriers

Our first objective was to identify barriers to MUAC utilisation. We aimed to map what was preventing caregivers from screening their children for malnutrition using the MUAC tape monthly. We first did an a priori barrier mapping, where we listed all potential barriers. We then validated those barriers with users of the tape (caregivers), and finally prioritised the barriers. This was done through interviews, focus group discussions, and observations of women using the MUAC tape.

A key behavioural barrier we identified was that women were challenged by having many household responsibilities for which they were accountable to their husbands and mothers-in-law. Routine MUAC screening was not one of these tasks, so these other chores took priority. Behavioural drivers of regular screening included that women wanted regular reminders to conduct screening and that men expressed an interest in playing a role in malnutrition prevention.

Identification of solutions

Once the key barriers were identified, we developed potential solutions to each key barrier and sought caregiver feedback on their preferences to refine the solutions we had drafted. We used different interactive activities with caregivers, such as prototyping and picture card sorting, to allow individuals to express their preferences

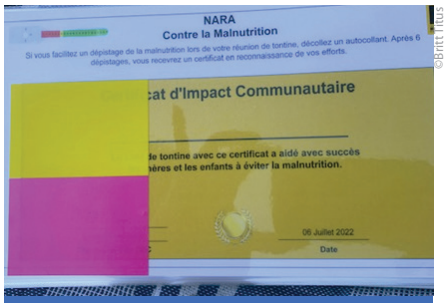
for solutions – such as what type of screening reminder they wanted. We tested the desirability and feasibility of each programmatic solution individually.

The five programme elements we identified through repeated refinement and testing with community members were:

Women's savings group meetings, or 'tontines', already occurred once per month (the same frequency needed for MUAC screenings), so 'tontine leaders' were asked to remind women to use the tape and facilitate group screenings within these meetings.

A behavioural science-informed video training was created for women, husbands, and imams (religious leaders). This included a real testimony by a local woman about how MUAC tapes benefitted her family, as well as components (such as a goal setting prompt) to encourage follow-through.

Husbands were asked to gently remind their wives to use the tape (a new role supported by both men and women).



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Interactice certificate used as part of the package of interventions, Nara. Mali, 2022

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Interactice certificate used as part of the package of interventions, Nara. Mali, 2022


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A screenshot from the behaviourally informed video training, Nara. Mali, 2021

Imams were asked to remind community members, especially men, about MUAC screening during religious meetings to facilitate change at the community level.

A colourful image was tested as a physical screening reminder in the home.

After testing and prototyping these components, we removed the physical reminder in homes, as women said they quickly stopped noticing it within a few days.

We also learned that tontine leaders needed motivation to play their role. We therefore added an interactive certificate as the fifth component, where leaders could peel off a sticker every time they led a group screening, with each month revealing another panel of a final certificate of leadership.

Testing the package of solutions through a pilot study

Pilot study methods

After the prototyping phase, it became essential to test the whole package in real-world conditions to measure how adherence and stakeholder perceptions might change over time and to assess the desirability, feasibility, and viability of implementation.

The package of five solutions was implemented during a two-month period in five communities in Mali. One community was a Peulh community[1], which required a slightly modified approach as these women were not involved in tontine groups. This community was included to learn how to scale our approach in a variety of community models. We worked through community relays to train tontine-attending women ('tontine women'), men, and imams in all communities using the training and testimonial video.

In this pilot, we collected data five different ways:

Pre-pilot survey of tontine women, non-tontine women, men, and imams to understand existing behaviours and perceptions (n=368).

Observations of relays as they train women, men, and imams to capture how the trainings were conducted and how trainees responded.

Observations of tontine groups during the pilot to appreciate how the tontine leader facilitated the group screening or reminded members about screening and how women responded.

Post-pilot focus group discussions with tontine women and tontine leaders, non-tontine women, men, and imams. A focus group discussion was held separately in each of the five villages for women, their husbands, and imams for a total of 15 discussions.

Post-pilot survey of all groups. Post-test participants were not necessarily the same as pre-test ones, allowing us a more real-world assessment of the community-based approach. We had 387 participants across five villages included in the post-tests: 12 tontine leaders, 231 mothers of children aged six months to five years, 129 husbands of those mothers, nine relays, and six imams.

Pilot study questions

Based on a behavioural theory of change, research questions for the pilot study were centred around women's, tontine leaders', husbands', and imams' capabilities, motivations, and opportunities to play their role in the intervention.

Capability

We first aimed to understand whether the caregivers could do the desired activity, by asking questions such as "What were the caregivers' perceived benefits and challenges of doing the group screenings?"

Motivation

To assess the motivation, we aimed to grasp what outcome people believed would happen if they did or did not do the screenings, for example by asking "What are their reasons and motivations for screening?"

Opportunity

We thought it was important to all assess whether the environment and context made it easy to do the desired activity, for example by asking questions like "Did the group MUAC screening feel like it took too long, too short, or was it just right?"

Pilot study results

The intervention built confidence

The implementation of our package of solutions resulted in women having more confidence to implement screening with MUAC.

The comparison between pre- and post-pilot surveys showed that, within two months, there was a 33% increase in women feeling "confident" in their ability to use the MUAC tape independently and an 11% increase in women feeling "very motivated" to use the tape regularly.

Women who wanted to use the tape regularly after participating in the pilot intervention cited reasons such as "preventing diseases in children", "avoiding malnutrition in children", "knowing on a daily basis if the child is malnourished or not", and "to take better care of children".

It is worth noting that comparable interventions[2] have previously failed to demonstrate any shifts in caregiver motivation to screen their children with the Family MUAC (Mbungua et al, 2022).

All women we spoke to in tontine groups agreed that the frequency of screenings had increased during the pilot period, because they were screening together in groups.

Video testimony resonated most

The video testimony was the most commonly and positively mentioned element of

[1] The Peulh people are an ethnic group in Sahara, Sahel, and West Africa, widely dispersed across the region.

[2] https://admin.concern.org.uk/sites/default/files/documents/2022-10/IGHN%20Kenya%20Family%20MUAC_IGHN%20Final%2010.10.22_0.pdf

the intervention. The video effectively communicated the importance of screening and the technique for doing it, while emotionally resonating with all groups involved. It was described as "touching" and "moving" and served to highlight the consequences of not screening. Tontine leaders believed this emotional effect was one of the main reasons that the training was successful.

Tontine leaders and community relays echoed this sentiment and stated that training was clearer than others they had been a part of. They shared that being able to both see and hear instructions through the video was more effective than just being told them.

Regular reminders were crucial

Out of all reminders offered, women found the group tontine meeting reminders to be the most helpful, as they received support from the tontine leader and other women in the group. Women described both highly respecting and trusting the tontine leader.

Most women preferred screening together in a group, but still liked that the tontine leader reminded women to do so at home as well, since they couldn't always bring all of their children with them.

Male engagement was important

In a context where wives are often tasked with overwhelming responsibilities by their husbands and mothers-in-law, we were concerned that MUAC screening might lead to more conflict in the family. However, when asked how the reminders were given, women said they were offered kindly and without violence or coercion. For tontine women, these complemented the reminders they were also getting at meetings – something they appreciated.

Husbands felt that their new role was important, not difficult, and echoed points made in the video regarding how early malnutrition detection can save both money and lives. In some cases, men reported doing the screenings themselves when their wives were busy or otherwise unable.

> ***"It's good that the men were involved, that way they will understand that it's not only the women who have to take care of the children and especially the children's health, everyone must be concerned"***
>
> – A tontine leader, summarising male involvement in the intervention

Imams appreciated the training and the testimony story. Most of the imams were able to provide reminders and they could observe and understand the link between their work and protecting their communities from malnutrition. One imam even commented that he started seeing more women in his own family screening children during the pilot period – something he hadn't seen them doing before.

Tontine leaders felt positive and did not feel that their new role was burdensome. They appreciated the certificate of recognition they were given and agreed that they had used it every meeting.

Unexpected results

> ***"During the two months, the support increased a lot, on the family side, the tontine members, and the men too. Everyone started doing it."***
>
> – A woman participating in the pilot

Qualitative results found that even women outside of the savings groups learned about screening through their networks and started attending meetings to screen children. This was not seen as problematic, but it did necessitate re-training the groups to upskill those women who joined later. Most women were therefore shown the video multiple times, which was not part of the original intervention design. This may have served as an additional type of 'reminder' for the groups.

Challenges and lessons learned

Some of the biggest challenges in the pilot study involved running the intervention in the Peulh community, as we could not utilise tontine groups as an entry point. Many women in the Peulh community did not have MUAC tapes to begin with, which undermined their ability to follow through with the screenings. While tontines were a desired setting for most women to convene and screen their children, we have yet to find a comparable structure to utilise in the Peulh community.

Women in the Peulh community were less motivated and less confident carrying out screening than women in the tontine groups. One woman stated that she did not feel ready to screen her own child after the video training. Instead, whenever she received a screening reminder, she would take her child to the community relay to conduct this for her.

In the other four communities, one health relay reported that he felt overwhelmed by non-tontine women who brought their children to him for testing. Some women also brought their children to be screened by the tontine leader. While positive spillover provides opportunities for network effects, this aspect was sometimes disruptive. In some cases, even tontine women who viewed the training video relied on the tontine leader to screen their children, rather than doing this themselves.

Screening children, seen as analogous to the responsibilities of health relays, led some tontine leaders to request compensation from the project for continuing this work. Women's confidence to carry out screening themselves, thus allowing leaders to solely facilitate, will need to be increased in future iterations of the programme.

Looking forward

Overall, all groups of participants found that the intervention supported malnutrition screening –with particular emphasis on the success of the training video with testimony and the group screenings at tontine meetings. Ensuring that all women have MUAC tapes and are confident enough to conduct screenings themselves will be addressed in future iterations of the programme.

The uniqueness of this Family MUAC approach is the degree to which its elements were developed alongside members of the community and in response to their preferences. Each intervention has been tested individually and, with the recent completion of the pilot study, tested as a package within the local system over a two-month period in real-world settings.

Immediate next steps include making changes to the programme design based on the insights from the pilot study. We will also conduct further research with a larger population.

Questions yet to be answered include:

How can we increase women's confidence in their ability to use the tapes at home, especially in the absence of a relay or tontine leader?

How can we best support women who are not part of the original training, but who come to the tontine meetings to screen their children?

How can we sustain these new roles and activities over time?

What is the impact of this programme on family referrals for treatment? And how does that compare to other Family MUAC Training programmes, in terms of cost-effectiveness?

A longer pilot, focused on maintaining motivation over time, will determine to what degree Family MUAC is a viable approach to increase wasting screening coverage. Other considerations, such as linkage to care and whether treatment services meet caregiver expectations, are also important mitigating factors.

For more information, please contact Britt Titus at **britt.titus@rescue.org**

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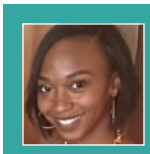
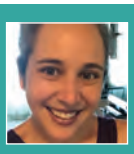
Women at a market in Nebaj municipality, Quiché, Guatemala

Generating demand in public sector nutrition programmes:

A way forward



Shaneka Thurman
Social and Behaviour Change (SBC) Advisor at JSI



Alyssa Klein
Nutrition and Food Systems Advisor at JSI

Amelia Giancarlo
Project Officer at JSI

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What we know:

Increasing consumer demand for safe and nutritious food is key to improving global nutrition. The public sector often lacks the sophisticated techniques and tactics used by the private sector to promote the purchase and consumption of healthy foods.

What this adds:

Findings from this study showed that, while nutrition programmers are aware of private sector techniques, their application requires strengthened capacity and donor support. To successfully generate demand for healthy foods, nutrition programmes should consider prioritising target behaviours, strengthening benefit statements and value propositions for nutritious foods, using branding, and engaging with creative agencies.

Background

Increasing consumer demand for safe and nutritious food is key to improving global nutrition. The private sector uses sophisticated techniques and tactics to promote products that appeal to customers' perceptions, values, and emotions. Since lower product prices equate to smaller profits, private sector actors have little incentive to promote healthy foods among low-income populations. On the other hand, the public sector has great incentive to generate demand for the purchase and consumption of healthy foods – but it lacks the effective marketing techniques to do so.

To understand how social marketing might be applied to generate demand for healthy foods, we conducted a two-part inquiry into how the *Brand and Marketing (BAM) Best Practices Framework* (Mann Global Health, n.d.) might be adapted for public sector nutrition programmes.

The BAM Framework was developed to consistently assess public and private sector marketing programmes according to five best practices: audience focus, brand strategy, campaign strategy, measurement, and governance. These best practices can be useful for global health and development programmes as they encourage shared understanding of definitions and standards of excellence for demand generation techniques. This enables more productive dialogue between donors and implementers, among implementing teams, and between implementers and creative agency partners.

Methods

The two-part mixed methods study consisted of an online survey and in-depth interviews complemented by a document review to test the appropriateness of the BAM Framework in the public sector nutrition context.

Online survey

The online survey aimed to ascertain widely accepted understandings and current practices related to social marketing and demand generation in nutrition-sensitive agriculture and market-based programmes. Survey data were collected in English and French to represent experiences of nutrition programmes in low- and middle-income countries (LMICs). Information was requested on the nature of the respondent's programme, including the geographic region (urban, peri-urban, or rural), the primary audience and the objective of their demand generation efforts, the primary nutrition outcomes, the principal collaborators (market vendors, producers, the government, distributors, etc.), and the types of interventions used. We also asked whether the respondent would be interested in participating in a semi-structured in-depth interview to further explore their programme's demand generation efforts. Descriptive analyses were used to synthesise the findings and draw early conclusions.

In-depth interviews and document review

Based on interest expressed in the survey, in-depth interviews were conducted to explore how programmes generate demand for healthy diets and how their practices align with the BAM Framework best practices.

The in-depth interview guide was structured around three main sections: (1) background information on the programme's demand generation efforts, how these fit into their larger programmatic goals, and what team members were involved in their planning and implementation (e.g., nutrition experts, SBC experts, monitoring and evaluation experts, creative agencies); (2) information on the programme team's efforts to understand their audience, including whether they had identified a clear behaviour to promote and a clear audience, and the extent to which they researched their audience and what they did with their findings; and (3) information on the programme's experience with branding, including whether they developed a brand or used a brand that already existed, whether the brand had a specific vision, and whether they experienced any branding challenges.

First-hand accounts from the in-depth interviews were complemented by a review of supporting programme documents, which included information on SBC strategies, creative briefs, formative research findings, marketing content, and other programmatic resources. Thematic coding was used to synthesise and analyse the data.

Results

Online survey

The survey received responses covering 33 activities implemented in 17 countries. Representatives from 22 implementing organisations shared experiences of their efforts to market healthy diets. Reported activities formed part of a variety of nutrition-related interventions, including scaling up and improving the quality of care groups, agricultural extension and diversification actions, and strategies to increase the access of caregivers to a continuum of care for young children.

The survey yielded five primary findings consistent across the respondents.

The host country's government played a critical role in demand generation activities. 95% of respondents listed the government as key collaborators, and 15 programmes were implemented in response to a government mandate. Other important stakeholders and collaborators included community agents and market actors (e.g., producers and vendors).

Respondents used a wide variety of interventions, but commonly reported community events such as peer groups and community dialogues as most relevant.

Consumer and market research and human-centred design were the most used marketing techniques. Only a few respondents used more sophisticated marketing techniques like branding (30%) and advanced audience segmentation (27%).

Terminology mattered, with inconsistent language often used to describe this work. Common language included terms such as SBC, market systems work, and demand creation.

Programmes often focused on improving dietary diversity rather than on specific foods or food products.

In-depth interviews and document review

In-depth interviews were conducted with respondents from four public sector nutrition programmes implemented in low-income, rural communities in Bangladesh, Guatemala, Rwanda, and Kenya. A total of 60 supporting documents were reviewed. The programmes aimed to strengthen value chains for animal-source foods (ASF), increase demand for ASF, reduce barriers to the adoption of priority health behaviours, increase adoption of water, sanitation, and hygiene behaviours, and determine the effectiveness of multi-tiered marketing campaigns to promote specific foods. Across the programmes, several demand generation strategies were used and evaluated according to the BAM Framework best practices.

Audience focus

In all four programmes, a focal audience was identified. Typically, programmes started with a broad target audience (e.g., caregivers) linked directly to the key goals and outcomes. Formative research was then used to further specify target audience members (e.g., caregivers of children under two in households that raise animals), who were typically those needing to practice the desired behaviour(s). Most programmes also targeted a secondary audience (e.g., influencers or supporting actors) for behaviour change. In alignment with the BAM Framework, the establishment of behaviours was a critical first step and considered a central component of all programmes. However, most programmes focused on 10 or more behaviours per actor, with no indication that the behaviours were staggered over time to avoid overwhelming programme participants.

Interview respondents recognised the importance of understanding the audience and could elaborate about their process for doing so. All programmes began with a literature review, followed by formative research to fill identified gaps. Programmes aimed to better understand the audience and the factors – i.e., barriers and motivators – that impact their ability to practice the promoted behaviours. Common themes that emerged from formative research focused on how audience members thought foods were expensive, valued the taste of food, could not access the foods being promoted, preferred imported over local foods, and associated certain foods with a certain gender or financial status. Few respondents reported learning information about their audiences' deeper motivations for food purchasing and consumption, with most learning focused on their sociodemographic characteristics or their perceptions about foods and food-related responsibilities.

Campaign strategy

Respondents recognised the importance and power of communicating a benefit to the audience during the campaign. Despite this, some articulated the benefit as the programme objective and/or promoted behaviour itself. For example, it was common to use *"eat [programme-promoted food] to improve nutrition and health outcomes"* as a benefit statement even though it also encompassed the objective and promoted behaviour of the programme. According to the BAM Framework, a benefit statement should articulate why or how eating promoted foods can contribute to improved nutrition and/or health, or what other benefits the audience would reap from this; however, this was not well understood. In some cases, failure to layer or sequence benefit statements risked overloading the audience with potentially conflicting benefits.

While programmes could articulate the importance of, and made efforts to conduct, formative research, the findings were not always reflected in the development of campaigns. For example, in cases where taste played a key role in food consumption, campaigns focused on communicating the nutritional value of the food they promoted, not on ways to improve the taste.

All four programmes used a variety of approaches – informed by the formative research – to market healthy foods. While these approaches were useful and contextually appropriate, they often lacked innovation and included traditional SBC interventions such as home visits from community health workers, community meetings, parenting sessions at early childhood development centres, cooking demonstrations, cooking competitions, text messages, menu planning games, reminder calendars, taste tests/new product showcases, mobile sales agents, religious leader sensitisation, school clubs, and radio dramas. Thus, opportunities remain to make approaches more resonant, salient, and memorable by prioritising consistent messaging, inspiring audience engagement, selecting intentional placements, and making emotional connections with the audience. There was moderate alignment with the BAM Framework, but clear opportunities for strengthening the marketing approaches.

Brand strategy

The BAM best practices related to branding were not reflected in the programmes reviewed and the use of branding was misunderstood by respondents. The term 'brand' did not resonate with respondents and most were unable to answer the question of whether their marketing work had a brand. Respondents were more receptive to the use of alternative terms like 'logo,' 'slogan,' or 'look/feel', but were still unable to provide details beyond acknowledging a donor's branding requirements and organisational logos.

> *"Programmes should carefully consider and assess how the audience might perceive the demand generation work based on their previous experience with specific donors and organisations."*
>
> – Interview respondent

> *"Because literacy rates are low, branding is not needed."*
>
> – Interview respondent

> *"Often, donor-funded programme names offer a natural branding opportunity, but these are not always capitalised on."*
>
> – Interview respondent

Two respondents shared their programme's branding, which reflected the brand vision. However, we were unable to determine whether branding was consistently and clearly executed because implementation had just begun.

Measurement

All respondents had plans to test message effectiveness, although some were less formal or structured than others. A common approach was concept testing (through focus group discussions) in which members of the target audience looked at an image, product, or message and answered questions based on their understanding of it.

Because the programmes assessed were in the early stages of implementation, they are yet to be evaluated. We were therefore unable to determine alignment with BAM principles.

Governance

All respondents had an organisational structure that *they* felt would allow them to successfully carry out their programme objectives. They confirmed that there was collaboration with donors, stakeholders, and influencers (like local governments), although some parties did not always support the design and execution of the strategy. All respondents followed a similar process that included a literature review, formative research, organising information and data from research, developing a strategy, implementing, and evaluating. Their plans, however, did not consider accountability for, or maintenance of, the brand. Furthermore, none of the programmes had explicit incentives in place to reward the adoption of desired behaviours and achievement of outcomes. While respondents described broad rewards of their programmes such as 'decreased mortality' and 'increased education,' there was no discussion of rewards being developed specifically for the programmes or their stakeholders.

Lessons learned

Findings from the survey and in-depth interviews showed that respondents were familiar with the BAM best practice concepts. Apart from branding, all interview respondents were applying, or planning to apply, the principles in their programmes to some extent. The ways in which some applied these principles leaves room for a deeper understanding of the best practices and for improving the quality of their implementation.

Do less to achieve more. Many implementers aim to change too many behaviours at once, overloading their audiences – often without the needed time, staff, or budget. Prioritising behaviours would allow programmers to streamline efforts, maximise resources, and maintain focus on the behaviours that have the highest potential to influence nutrition outcomes.

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A woman shopping in Dhaka, Bangladesh

Identify whether the target audience would truly be persuaded by only receiving information. The target audience's lack of knowledge is rarely the main problem. Reemphasising the importance of a healthy diet and sharing nutritional benefits is often the default approach (instead of more comprehensive demand generation approaches), but may not resonate with the audience or compel them to act. Even when people know what they should do, other structural, social, or internal factors such as cost, community norms, or personal preferences may play a bigger role. Without addressing the more pervasive factors, sharing information or promoting knowledge is insufficient to generate and sustain demand.

Prioritise and allocate sufficient time and resources to developing campaigns that are creative and innovative. This could mean hiring or engaging more internal staff with diverse backgrounds (e.g., marketing, anthropology, psychology, technology, etc.) or contracting external firms (e.g., creative agencies) that inspire and help develop more salient and effective marketing campaigns.

Consider developing a brand when needed. Branding is underutilised in public sector nutrition marketing. However, its pivotal role in the private sector suggests opportunities for using branding to influence behaviour change. When developing a brand, its sustainability beyond the current programme should be considered, including the potential to partner with local public and private sector actors.

Conclusion

While the private sector has sophisticated marketing techniques that can be applied to the public sector, there are fundamental differences in how the private and public sectors operate. Generally, the private sector has more resources and time for implementation. The public sector tends to have fewer resources and a finite amount of time for implementation that is based on their award/contracting structure. Despite these differences, this study indicated that nutrition programmers are aware of private sector techniques that may increase the effectiveness of their efforts. However, applying these techniques often requires strengthened capacity and donor support. Our findings suggest a need to prioritise behaviours, strengthen benefit statements and value propositions for nutritious foods, explore use of branding, and engage creative agencies to increase the success of demand generation for healthy diets.

For more information, please contact Alyssa Klein at **alyssa_klein@jsi.com** or **klein.alyssa@gmail.com**

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Food-based recommendations to improve vitamin A and iron intake in Niger

A woman preparing a meal at a cooking demonstration in Rafa, Niger

Jen Burns
Senior Technical Advisor, Nutrition in Humanitarian Contexts, USAID Advancing Nutrition

Hadiara Souley
former Nutrition Lead for USAID Advancing Nutrition, Niger

Lisa Sherburne
Technical Director, Social and Behaviour Change, USAID Advancing Nutrition

Abigail Conrad
Learning and Research Advisor, USAID Advancing Nutrition

Mamoudou Djibo Khaled
former SBC Advisor for USAID Advancing Nutrition, Niger

Jennifer Nielsen
Senior Advisor for Nutrition, Helen Keller International

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What we know:

In Niger, iron and vitamin A deficiency remain high for multiple reasons. The provision of information alone is often not sufficient to change behaviours.

What this adds:

An approach to increase the consumption of vitamin A- and iron-rich foods was designed with community members. These tools identified 18 locally available foods rich in vitamin A and iron that were available and acceptable for young children and pregnant women, as well as household roles that could be promoted through community-based platforms (Husbands' Schools, women's peer groups, and radio spots).

Background

Diets are typically insufficient in rural Niger. Few pregnant and lactating women or children aged 6–23 months consume an adequately diverse diet (Cisse-Egbuonye et al, 2017; Egbuonye et al, 2021). Coverage of vitamin A and iron-folic acid supplementation is also inconsistent, with quality implementation constrained by multifaceted barriers (Begum et al, 2018).

The Ministry of Public Health (MoPH) has a national nutrition security strategy, a micronutrient supplementation strategy, a national health and nutrition social and behaviour change (SBC) communication strategy, and multiple resources for promoting improved diets, including a national book of recipes. Despite these resources, more can be done to support households in food-insecure contexts to consume locally available and acceptable iron- and vitamin A-rich foods.

We introduced a systematic process to improve dietary practices among pregnant and lactating women and children aged 6–23 months by developing evidence-based tools that can be integrated into existing community-based programming platforms.

Programme description and justification

Between 2020 and 2023, the United States Agency for International Development's (USAID) flagship multi-sectoral nutrition project, USAID Advancing Nutrition, targeted: a) a reduction in the prevalence of anaemia for women of reproductive age and adolescents; and b) a reduction in vitamin A deficiency in children under five years.

We collaborated with the MoPH and USAID implementing partners in Maradi and Zinder regions – areas with the highest prevalence of malnutrition and food insecurity – to meet our objective through existing programmes and strategies.

Effective nutrition SBC promotes the adoption of healthy behaviours and reduces barriers to maintain those behaviours over time (USG, 2022). Understanding the role of human behaviour is key to the success of nutrition interventions, as every change requires someone to act – whether market actors, health workers, community leaders, or family members.

Quality nutrition SBC processes follow six key steps: 1) prioritising behaviours that can improve nutrition outcomes; 2) formative research; 3) strategy design; 4) planning for implementation and monitoring; 5) implementation; and 6) evaluation. This article focuses on the first four steps, with MoPH and partners responsible for subsequent implementation and evaluation.

Methodology

Defining priorities

We reviewed existing data to identify the behaviours that have the largest impact on iron and vitamin A intake. The team prioritised six behaviours ('behavioural outcomes'), which included two related to dietary improvement – "caregivers use a variety of nutrient-rich foods each day in the meals and snacks of their child aged 6–23 months" and "pregnant and lactat-

ing women eat a variety of nutrient-rich foods daily, for both meals and snacks."

Conducting formative research

To understand the factors that prevented or supported people to practise these priority behaviours, we conducted formative research with women, their family members, community leaders, health providers, and stakeholders at national and district levels.

The findings highlighted the importance of social and gender norms, as well as family support, in improving women's and children's dietary diversity. The need to improve food access and quality counselling – focusing on locally available food rather than the variety of 'good' foods, which may be unavailable to households – was also highlighted.

Elaboration of intervention strategies

Using the research findings, we engaged with MoPH and partners at the national and sub-national levels to prepare and validate an SBC strategy to operationalise the micronutrient elements in the national SBC communication strategy and bolt on to communication solutions, which identified activities to strengthen existing programmes by reducing barriers to action.

Planning

Partners mapped their activities in the two regions to visualise where there was convergence and where there were gaps. With this roadmap, we co-created solutions with partners for community media and materials that could be integrated into existing nutrition programmes.

We prepared flipcharts for group discussions that modelled positive social and gender norms and greater family support for women's food choices, for herself and her children. One set was specific to fathers and husbands, for use in 'Ecoles des maris' (Schools for Husbands). We also prepared community radio spots and magazines with technical support from Breakthrough ACTION[1]. Each material was pre-tested and refined with communities.

Local partners identified vitamin A- and iron-rich foods to promote in these materials that were both acceptable and locally available within their communities. We then used food databases and composition tables to identify and then form a list of those foods with greater micronutrient density.

To ensure acceptability, we asked "which of these key foods would women be willing and able to eat more of, or feed young children of different ages?" USAID Kulawa and Girma conducted participatory exercises with two communities as part of this step. Using the average amount of food that caregivers may add to their own or their child's meal, community groups tested food preparations via focus group discussions, pile-sorting exercises, group food preparation exercises, and reflection.

Findings

Barriers to adequate dietary intake

Access to affordable, locally available foods

Access to diverse vitamin A- and iron-rich foods remained a primary challenge for communities. Although caregivers knew about 'good' foods to feed children (from health workers and the media), many of these foods were simply not available in their homes. Agricultural yields did not last all year and, even if available in their community, many foods were unaffordable – including animal source foods such as *kilishi* (dried meat), locusts, liver, and eggs.

Social and gender norms

For women, we found that social and gender norms constrained food choices and were entwined with family support. Men were the primary decision makers about what food to purchase and what crops to grow, while women were responsible for gathering wild greens and fruits. Women (including those pregnant or lactating) were expected to serve their own food last, after all other members of their household, with little food remaining.

For young children, customs held by elder women dictated that children were fed a monotonous porridge consisting primarily of millet or sorghum. Children aged 6–11 months were usually fed from a cup two to three times a day. Caregivers offered children aged 12–23 months the same food at the same frequency, but double in quantity. Such social norms further limited food choice when adding to children's meals (e.g., some communities believed children should not eat eggs, leafy greens, and/or meat).

> ***"We also do not give eggs to children under five, otherwise the child will be locked up like an egg, that is to say, it takes a long time before it starts to speak"***
>
> – Community leader

However, some norms were found to enable positive change. Communities noted that men were expected to provide for their families and care for their wives and children, while and mothers-in-law were responsible for teaching their daughters-in-law. Most men and older women felt motivated by the positive recognition of fulfilling their roles.

Counselling on diets

Women shared that health workers advised them on good foods to eat during antenatal care visits, outreach, and community groups – although they recognised that most of the recommended 'good' foods were not available in their communities. Even if available, as women they would not have the choice to eat the food or not.

Selecting vitamin A- and iron-rich foods

Shortlisting available foods

To identify specific iron- and vitamin A-rich foods that were available in these highly food-insecure communities, and that were feasible for caregivers to feed children and eat themselves, we first narrowed down a list of 18 foods (Table 1). Using this list of foods available locally, partners conducted exercises in two communities.

Acceptable foods for children

Through interactive card-sorting exercises, caregivers narrowed the list to the foods they would be willing to feed their children. In both communities, caregivers identified three foods that they found acceptable and realistic to add to their child's meals all year round: ***1) dried moringa powder; 2) dried bean leaf powder; and 3) goat's milk.***

Caregivers noted that they grew and gathered moringa and bean leaves in the wild so they could process these at home to feed children. When caregivers cooked porridge using one of the three identified foods, they saw that children enjoyed the taste and finished their

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A woman preparing a meal at a cooking demonstration in Rafa, Niger

[1] Breakthrough ACTION is USAID's flagship global SBC project, which encourages people to adopt healthier behaviours.

Table 1 Nutritional content of locally available foods for children in Niger

	Child 6–11 months			Child 12–24 months			
Food	**Weight** (g)	**Iron** (% RDA)	**Vitamin A** (% RDA)	**Weight** (g)	**Iron** (% RDA)	**Vitamin A** (% RDA)	**Type of preparation**
Millet (whole grain)	50	28.6%	0%	75	45.0%	0%	Porridge
Sorghum (whole grain)	50	12.7%	0%	75	30%	0%	Porridge
Baobab (leaves)	10	12.5%	2.3%	20	39.1%	10.9%	Dried then boiled
Moringa (leaves)	10	9.9%	25.1%	20	31.1%	119.6%	Fresh or boiled
Amaranth (leaves)	10	7.0%	3.5%	20	22%	16.5%	Fresh or boiled
Manioc (leaves)	10	5.4%	4.4%	20	16.9%	21%	Boiled
Niebe (leaves)	10	31.8%	4.8%	20	100%	22.9%	Dried then boiled
Mango (orange)	15	0.1%	8.7%	30	0.4%	41.6%	Raw
Carrot	15	1.2%	14.3%	30	3.9%	68.2%	Boiled
Tomato	5	4.1%	0.4%	10	13%	1.7%	Dried then boiled
Sesame	5	5.1%	0%	10	16%	0%	Dried, raw
Soumbala (fermented seeds)	5	6.9%	0.0%	10	21.7%	0.0%	Boiled
Butter (cow)	10	0%	13.4%	10	0%	31.9%	Fresh
Milk (cow)	50	0.05%	2.3%	75	1.1%	8.3%	Fresh
Milk (goat)	50	0.5%	3.0%	75	1.1%	10.6%	Fermented
Egg	50	9.1%	6.6%	50	14.3%	15.8%	Boiled
Locusts	15	6.8%	0%	30	21.4%	0%	Fried, powdered
Liver (sheep)	5	6.6%	136.8%	5	10.4%	325.7%	Boiled

RDA = Recommended daily allowance

Highlighted values indicate foods with favourable iron (grey) and vitamin A (blue) contents.

meal. Caregivers in these communities also identified cow's milk, butter, mangoes, baobab leaves, crickets, small fish, liver, and sesame as having the potential to feed children, but only when seasonally available.

Acceptable foods for mothers

Pregnant and lactating women used the list of locally available foods to narrow down five acceptable additions: ***1) cow's butter; 2) eggs; 3) moringa leaves; 4) liver; and 5) goat's milk.***

Learnings

Successes

Addressing malnutrition requires multiple actors coordinating at the same time and place. Through a participatory process, USAID Advancing Nutrition collaborated with the MoPH at national and sub-national levels and six nutrition partners. This collaboration ensured technical expertise and co-design to develop tools that met programme needs.

Achieving SBC relies upon locally acceptable and feasible actions; giving technically sound information is rarely sufficient for people to make changes. Focusing on activities that promote dietary diversity – including counselling, group discussions, and using media to promote specific foods – gives realistic options to enable practical skills development, problem solving, and action. The final list of key foods that are locally available and acceptable helps to contextualise the national recipe book to select recipes that promote iron- and vitamin A-rich foods.

Challenges

The limited time available was a key challenge, as the programme ended just prior to providing the finalised tools to MoPH and nutrition programmes for use. Therefore, we do not yet have findings on effectiveness in programme settings beyond a pretest.

Status quo bias – i.e. the tendency to prefer what is familiar – is common in nutrition, making the introduction of new foods a challenge. Educating mothers and fathers is usually not sufficient to overcome this bias.

Additive bias – i.e. the tendency to solve problems through addition – meant that nutrition experts were tempted to include all possible nutrient-rich foods on key food lists. However, focusing on a smaller number of changes and limiting new information is often more effective in SBC strategies. Engaging community members in the process of selecting only foods that were available, affordable, and desirable helped to keep these lists focused and relevant.

Lessons learned

Communities have solutions. They were able to identify locally available and acceptable iron- and vitamin A-rich foods to feed young children and pregnant and lactating women. Communities also shared the reasons why their knowledge about nutrition was not put into practice and what they needed to make changes. This demonstrates the importance of community engagement to identify solutions.

Communities also highlighted the need for greater support for women. Positive social and gender norms revealed opportunities for change through culture (e.g., the representation of an ideal man). These strong norms are an entry point for reflection and discussion related to nutrition, especially in the early days of life, when lifelong benefits to the family and including the father can be achieved.

> ***"The ideal husband is one who provides for his family and takes on all the family burdens, such as health, education, food, and clothing. He cannot have peace of mind when the family is in a critical situation."***
>
> – A father from Zinder

Although the list of locally available foods received multiple reviews and revisions, the shortlist was identified by only two communities. Partners working in these regions could engage other communities to confirm or refine the short list so that it is adapted to their specific contexts.

Conclusion

As the government and implementing partners strengthen the agricultural sector, improving access to and use of micronutrient-rich foods is needed to improve diet quality in rural Niger. Identifying and promoting acceptable, locally available, micronutrient-rich foods is critical to making this happen.

Using SBC methods, USAID Advancing Nutrition and implementing partners facilitated a stepwise approach that focused on the issues identified by women and communities, instead of relying on generic information. We designed new tools, including technical briefs, radio spots for communities, group discussion flipcharts for community-based groups, and a guide to localise food-based recommendations. Their actual use and impact will now need to be taken forwards by MoPH and implementers.

For more information, please contact Mohamed Yattara at **myattara@hki.org**

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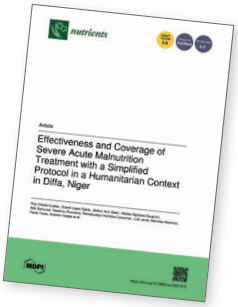
Wasting treatment: The effectiveness and coverage of a simplified protocol in Niger



This is a summary of the following paper: *Charle-Cuéllar P, Lopez-Ejeda N, Gado A et al (2023) Effectiveness and Coverage of Severe Acute Malnutrition Treatment with a Simplified Protocol in a Humanitarian Context in Diffa, Niger. Nutrients, 15, 8, 1975.*
https://doi.org/10.3390/nu15081975

A non-randomised community-controlled trial assessed the effectiveness and coverage of a simplified combined protocol for treating severe wasting in children aged 6–59 months, in the humanitarian context of the Diffa region, Niger.

In both the control and intervention groups, severely wasted children received outpatient treatment at health centres and health posts, provided they had no medical complications. In the control group (n=174), the standard community-based management protocol was applied. The intervention group (n=406) followed a simplified protocol (ComPAS[1]) admitting children based on mid-upper arm circumference (MUAC) < 115mm or oedema presence and treating them with a fixed dose of ready-to-use therapeutic food (RUTF). Children weighing above 5kg received two sachets a day, while children weighing less than 5 kg received a reduced dose of 500 Kcal/day (one sachet a day) in order to not markedly exceed the standard Niger protocol. Children were discharged from the intervention group when their oedema resolved and their MUAC reached ≥125 mm for two consecutive weeks.

To ensure comparability between groups, a socioeconomic questionnaire was administered to a subset of caregivers who coincidentally brought their children for treatment on the same day of data collection; this amounted to 117 caregivers from the control group and 251 from the intervention group. This questionnaire gathered data on demographics, livelihood, food security, and dietary diversity. The coverage of severe wasting treatment at both the study's outset (November 2020) and conclusion (August 2021), in both study areas, was evaluated using standardised (SLEAC[2]) methodology.

Study groups had comparable average ages, age distributions, sex ratios, and demographics. No cases of oedema were recorded in either group. The intervention group showed a higher cure rate (96%) compared to the control group (87.4%) (p<0.001). There was no difference in the average length of stay (35 days), but the intervention group used fewer RUTF sachets per cured child (70 vs. 90) (<0.001). Discharge errors (the number of children who were discharged considered cured before having reached the relevant criteria) were significantly lower in the intervention group compared to the control group (3.2% vs 10.9%). Both groups experienced increased coverage.

The study had limitations, notably the absence of randomisation and an imbalance in group sizes. However, robust statistical tests were used to address this imbalance. The study also highlighted challenges related to health facility overload and access issues due to flooding, affecting the reach of children in need to treatment sites.

These findings complement those of a previous study in the Niger context, which explored a different simplified approach led by community health workers. Both studies offer insights for policymakers considering the adoption of simplified approaches, particularly in exceptional circumstances such as those in Diffa, to enhance the effective treatment of more children.

[1] https://airbel.rescue.org/projects/compas-combined-protocol-for-acute-malnutrition-study/
[2] https://www.fantaproject.org/sites/default/files/resources/SQUEAC-SLEAC-Tech-Reference-Oct2012-SLEAC.pdf

Routine antibiotics for infant growth failure: A systematic review

This is a summary of the following paper: *Imdad A, Chen F, François M et al. (2023) Routine antibiotics for infants less than 6 months of age with growth failure/faltering: A systematic review. BMJ Open, 13, e071393.*
https://bmjopen.bmj.com/content/bmjopen/13/5/e071393.full.pdf

Malnutrition is both a driver of and exacerbating factor for infections. When children aged 6–59 months enter nutrition programmes, they are regularly prescribed routine antibiotics to counter this.

"This practice in infants has the potential to harm due to recently identified risks of antibiotic use in infancy, including the diminishment of infant gut microbiome"

This systematic review followed Cochrane Handbook[1] guidance and included individual and cluster randomised trials, as well as non-randomised trials and cohort studies with control groups. Case-control, case reports, case series, and commentaries were excluded. The objective was to compare the effect of no routine antibiotics (or alternative regimens) against routine antibiotic prescription following treatment in infants aged under six months with growth failure or faltering (Box 1).

Studies in both hospital and community settings were considered, but neonatal intensive care and congenital anomaly study populations were excluded. Antibiotic regimens and doses varied between studies, but only oral or intravenous administration was included.

Box 1 Study outcomes

- Mortality
- Clinical deterioration
- Recovery from comorbidity
- Markers of intestinal inflammation-serum C reactive protein
- Hospital-acquired infections
- Non-response

Of 5,137 screened studies, 157 were deemed eligible for full-text review. None of these 157 studies qualified for inclusion in this review for the following reasons: ineligible study design (n=85), patient population (55), comparison group (7), intervention (8), and indicators (2).

Despite a robust methodology, the fact that not a single study was eligible highlights the paucity of evidence in this area. The researchers could have broadened their search criteria from aged under six months to under five years, which may have yielded results, but this would have answered a different study question for a different population.

It is unusual to see a systematic review with no evidence to draw upon, yet this is an important finding. Publication bias is a well-known phenomenon in health research – where so-called 'null' findings often do not make it to print. This article highlights the importance of featuring such work, as it flags the need for researchers to investigate the potential risks and benefits of antibiotic use in this population, with large sample sizes and robust methods. In summary, we now know what we don't know.

[1] https://training.cochrane.org/handbook

Infant infection and nutrient deficiency predict impaired growth at five years: Pakistan

This is a summary of the following paper: *González-Fernández D, Cousens S, Rizvi A et al. (2023) Infections and nutrient deficiencies during infancy predict impaired growth at 5 years: Findings from the MAL-ED study in Pakistan. Frontiers in Nutrition, 10, 1104654.* **https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9982131/**

This paper is a secondary data analysis of the MAL-ED[1] cohort. A subgroup of 277 healthy newborns from Sindh province, Pakistan, was selected between January 2010 and February 2012 for study. The group was followed up to age 66 months, with 14% of the group lost to follow-up.

The 237 children were from low-income families. Overcrowding (>3 people per room) was present in 75% of homes, 15% did not have access to sanitation, and 81.5% of the study group lived with food insecurity. Stunting, underweight, and wasting prevalence were high (Figure 1).

Various regression models were used to predict the impact of assorted variables (at enrolment and during the study period) on future growth failure (at the end of the study period, e.g., 54– 66 months), using anthropometry, health records, questionnaire data, and biomarkers (faecal and blood).

Stunting

Multivariate Poisson regression highlighted that acute lower respiratory infection, during the first year, at an average duration of ≥2 days per month was associated with increased stunting aged five years.

Underweight

Higher weight in the first days of life, receiving formula in the first six months, and commercial baby food feeding between 6-11 months were associated with decreased risk of underweight aged five years. Higher serum transferrin receptor concentration (indicative of intracellular iron deficiency) – but, importantly, below pathological levels – was associated with decreased underweight aged five years. No other iron status indicators were associated with child growth at five years. High neopterin levels (indicative of an immune response) in the first year and Campylobacter infection in the first six months were both associated with increased underweight aged five years.

Underweight + stunting

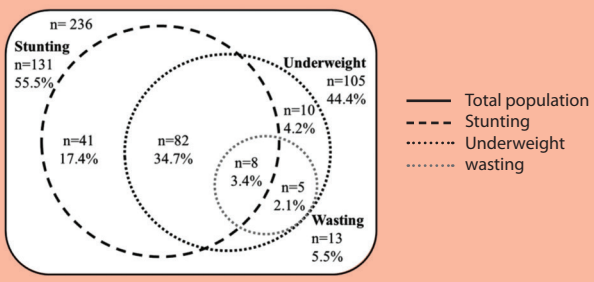
Lower weight in the first days of life, lower quantile family income, greater duration (days per month) of acute lower respiratory infection, and elevated neopterin (>6.8nmol/L) in the first year were each associated with concurrent underweight + stunting aged five years.

This study employed a robust methodology with detailed data cleaning and statistical controls. The sample size, although small for some variables (e.g., length and height data aged 0–35 months), was sufficient to answer the study objective. Various observations of variables with weaker correlations were found, but are beyond the scope of this summary.

Infant enteropathy and respiratory infection appear to predict future malnutrition and the targeting of Campylobacter and broader vaccination coverage may reduce child malnutrition in this population. The relationship between serum transferrin receptor concentration (anaemia), neopterin (inflammation), and malnutrition is complex, but these findings may also indicate that early malnutrition is the pathway for these associations aged five years. Efforts should focus on reinforcing exclusive breastfeeding under six months and supporting nutritious, diverse diets for children over six months, in addition to infectious disease prevention.

[1] https://academic.oup.com/cid/article/59/suppl_4/S193/281312

Figure 1 Prevalence and overlap of stunting, underweight, and wasting in children aged 54–66 months



Mitochondrial homeostasis and severe malnutrition

This is a summary of the following paper: *Ling C, Versloot C, Kvissberg M et al. (2023) Rebalancing of mitochondrial homeostasis through an NAD+ -SIRT1 pathway preserves intestinal barrier function in severe malnutrition. eBioMedicine, 96.* **https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10520344/**

Among other symptoms, children with severe malnutrition may develop intestinal dysfunction. This in turn limits nutrient absorption and weakens immunity, resulting in a complicated downward spiral of their condition.

"A growing body of evidence suggests that impaired mitochondrial function in epithelial cells can disrupt intestinal barrier integrity."

– Ling et al., 2023

This study randomised eight mice to a low protein diet and eight mice to a normal protein diet to simulate severe malnutrition. Another group (n=8) were fed a low protein diet then given oral nicotinamide (water-soluble vitamin B3) supplementation from mid-way through the study. Diets were controlled for vitamin B3 to increase the validity of the study.

Additional experiments were conducted on low protein diet mice using injected resveratrol[1] (n=6), injected EX-527[2] plus nicotinamide (n=6), placebo injection (n=6), and nicotinamide-only (control) (n=6). Another study investigated normal protein diet mice (control) (n=6), low protein diet mice with injected rapamycin[3] (n=8), and low protein diet mice plus placebo injection (n=6). For each mouse, multiple immunological, histological, and broader physiological tests were conducted.

Predictably, the low protein diet led to villus atrophy (reduced gut surface area), nutrient malabsorption, mitochondrial abnormalities, and intestinal barrier dysfunction. In these malnourished mice, nicotinamide supplementation increased mitophagy[4] and improved intestinal barrier function. Rapamycin supplementation reduced intestinal barrier dysfunction and nutrient malabsorption.

Oral nicotinamide supplementation may be a more promising treatment for children with severe malnutrition as it is well tolerated and does not affect immune function – severe malnutrition often occurs in high infectious burden areas. By contrast, as an immunosuppressant, rapamycin may be less applicable for this population.

A note from the editors

This paper is highly technical, and the experiment was conducted on mice in a lab setting. The exact findings and methods used are therefore less relevant for practitioners working in the field. Although a full breakdown of pathways, mechanisms, timelines, and treatment protocols is beyond the scope of this summary, these details can be found in the original study. What this paper does highlight is that this specific intervention may offer an additional therapeutic target for children with severe malnutrition. No treatments currently target the intestinal barrier, so this regimen may provide another tool to increase child survival. As this was an animal study, which are inherently limited, more research is needed in humans. However, these compounds have been shown to be safe, readily available, and inexpensive. These findings are exploratory, yet promising.

[1] Resveratrol is a readily available polyphenol supplement, often extracted from the skins of grapes and berries.
[2] EX-527 is a selective sirtuin inhibitor drug.
[3] Rapamycin is an immunosuppressant drug, commonly used to prevent organ transplant rejection. Recently, many researchers have focused on Rapamycin as a treatment to increase mitochondrial efficiency, which may exhibit numerous benefits for health and disease prevention.
[4] Mitophagy is the removal of damaged mitochondria, increasing mitochondrial efficiency.

Alternative metrics for tracking population-level trends in child linear growth

This is a summary of the following paper: *Aimone AM, Bassani DG, Qamar H et al (2023) Complementary and alternative metrics for tracking population-level trends in child linear growth. PLOS Global Public Health, 3, 4, e0001766.* **https://doi.org/10.1371/journal.pgph.0001766**

This study explored a range of child linear growth indicators, based on height distributions from anthropometric surveys, which were treated as potential alternatives or complementary metrics to stunting prevalence[1] – commonly used to track population-level trends in child nutritional status. Although stunting prevalence is straightforward to estimate, it has several limitations, including that the cut-off threshold has no biological basis and that it does not capture the whole population shift in linear growth faltering common in low- and middle-income countries (LMICs). Therefore, this study aimed to evaluate alternative linear growth metrics based on their correlations with stunting prevalence and 1) under-five mortality, 2) gross domestic product, and 3) maternal education.

The data used for this analysis came from 156 demographic and health surveys conducted in 63 LMICs between 2000 and 2020. The median sample size was 5,461, with sample sizes ranging from 1,290 to 239,588.

The study used Spearman's rank correlation coefficient (r) to identify indicators as alternatives to stunting if they were strongly correlated with stunting ($r > 0.95$) and at least as strongly correlated with the selected population indicators as stunting. Indicators were considered complementary if they were less strongly correlated with stunting ($r < 0.95$) but still correlated with population indicators.

The study identified several indicators as potential alternatives to stunting prevalence, including stunting at ages two to five years, mean height-for-age z-score (HAZ), and the 25th percentile HAZ. Six indicators were considered complementary to stunting, such as SITAR-IP[2], predicted HAZ at age two and five years, HAZ and height-for-age difference slopes from one month to two years, and growth delay slopes from one month to two years and from two to five years. Three other metrics including predicted HAZ at birth had weak correlations with population indicators ($r < 0.43$).

Among its limitations, this approach had a narrow scope, and the use of other indicators of health, socioeconomic status, or within-country inequalities may have yielded different conclusions. However, the availability of population-representative measures of some of the other relevant domains (e.g., cognitive development) was limited both in demographic and health surveys and from other data sources. The influence of regression modelling on model-derived metrics, the low number of surveys, and the lack of examination of variations in survey quality present additional limitations.

Future research should focus on the acceptability and interpretability of these metrics by stakeholders. Stunting prevalence, despite its limitations, is well known to policymakers. Adopting alternative and complementary indicators would require defining benchmarks and establishing guidance for their use – but they may offer conceptional advantages.

[1] Stunting prevalence is defined as the proportion of children in a population with a HAZ more than 2 standard deviations below the median of the World Health Organization Child Growth Standard.

[2] The Super-Imposition by Translation and Rotation Intensity Parameter (SITAR-IP) is a scaling factor that reflects the velocity of a linear growth curve relative to the mean velocity.

Dietary diversity in Bhasan Char relocation camp, Bangladesh: Children and adolescents

This is a summary of the following paper: *Das S, Fahim S, Rasul M et al. (2023) Nutritional and dietary diversity status of under-5 children and adolescent girls among forcibly displaced Myanmar nationals living in Bhasan Char relocation camp, Bangladesh: A cross-sectional survey. BMJ Open, 13, e068875.* **https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10069579/pdf/bmjopen-2022-068875.pdf**

This cross-sectional survey of 248 children (aged 6–59 months) and 299 adolescent girls (aged 11–17 years) was randomly sampled from a population of 17,698 forcibly displaced Myanmar nationals residing in Bhasan Char relocation camp. Sociodemographic information, dietary diversity status, length/height, weight, mid-upper arm circumference (MUAC), and head circumference data were collected from all participants.

Children consuming at least four of eight food groups within the preceding 24 hours were deemed to have 'minimum dietary diversity'. Adolescent dietary diversity was determined using Food and Agricultural Organization 'Women's Dietary Diversity Score' guidelines.

For adolescent girls, severe (14.1%) and moderate (28.8%) stunting prevalence was high. Most consumed starchy staples (98%) and dark green leafy vegetables (79%), but few consumed animal-based proteins or vitamin A- or iron-rich foods. The distribution of dietary diversity did not vary much by nutritional status, with an overall average of 3.1 (SD 1.03) out of nine food groups consumed.

For children aged 6–59 months, severe (8.5%) and moderate (23.1%) stunting was also prevalent. Severe (1.2%) and moderate (10.9%) wasting was more common by weight-for-height than MUAC, which were 0.8% and 8.5% respectively. Only 25% of children aged 6– 59 months achieved minimum dietary diversity.

"Nearly all the children we surveyed consumed diets that were mainly carbohydrate based and poorly diversified, irrespective of their nutritional status."

Regression analyses showed that no anthropometric indices, for both adolescent girls or children in the study, were significantly associated to dietary diversity scores – which may reflect the generally poor dietary diversity across all groups, making it difficult to compare between each.

Appropriate measures were taken to sample only a single member from each household and validated anthropometry tools, pretested survey questioners, and pretested food frequency questionnaires were used, increasing the validity of this study. The researchers recruited enough participants for the study to be appropriately powered, based on their sample size calculation.

As the data collection period was short (7–12 November 2021), seasonality may skew these results as different periods of the year may present different crop shortfalls. All participants had access to improved drinking water and sanitation systems, which may not be true of comparable settings. There was a 100% response rate, which is unusual, but this may reflect the tightly controlled environment this group has been relocated to.

The findings for these two study groups are important. Both are disproportionally affected by malnutrition, yet they are distinct groups and we cannot extrapolate the findings to other child, youth, or even adult populations in this setting. Diets for these two refugee groups were poor compared to the local population and efforts should be made to improve their long-term nutrient status – through the provision of diversified and micronutrient-fortified rations.

Nutritious supplemental foods for pregnant women from food-insecure settings

This is a summary of the following paper: *Ciulei M, Smith E, Perumal N et al. (2023) Nutritious supplemental foods for pregnant women from food insecure settings: Types, nutritional composition, and relationships to health outcomes. Current Developments in Nutrition, 7, 6.*
https://www.sciencedirect.com/science/article/pii/S2475299123247678

Pregnancy is characterised by an increased demand for energy and nutrient intake, with poor nutrition during this period being a contributor to adverse maternal and infant health outcomes. There is growing evidence that the provision of nutritious supplemental foods to undernourished pregnant women can improve birth outcomes. However, comparing and synthesising the evidence base is challenging due to differences in intervention design and products and the use of ambiguous terminology. This study aimed to define balanced energy-protein (BEP) supplements and lipid-based nutrient supplements (LNS) and to review the evidence supporting each by a narrative review of systematic reviews and meta-analyses (SRMAs).

BEP supplements differ from LNS because they provide 25% of energy from protein, while LNS provides less than 50% of energy from fat (including essential fatty acids). There are three formations of LNS – small-[1], medium-[2], and large-[3] quantity LNS. The energy provided by medium- and large-quantity LNS overlaps with some BEP supplements, but the proportion of fat and protein differentiates the two.

This study identified five SRMAs (20 trials) that evaluated the effect of BEP compared with no BEP/control. BEP supplements ranged in calories (118 to 1,017 kilocalories), protein (3 to 50 grams), fat (6 to 57 grams), and micronutrient content. Overall, BEP improved birth weight and reduced the risk of stillbirth and small for gestational age. A total of three SRMAs (five trials) evaluated the effect of LNS compared with iron folic acid (IFA) or multiple micronutrients (MMNs). The LNS interventions comprised small- and large-quantity LNS that ranged in calories (118 to 746 kilocalories), protein (3 to 21 grams), fat (10 to 53 grams), and micronutrient content. When compared with IFA, LNS increased pregnancy duration, birth weight, and birth length and reduced the risk of small for gestational age and infant stunting. However, no beneficial effect of LNS was identified when compared with MMN.

Despite heterogeneity in the nutritional composition of BEP supplements, which complicates interpretation of results, the evidence suggests that these products may improve birth outcomes in nutritionally at-risk populations. Further research is needed to clarify the most appropriate BEP supplement composition required and which pregnant women would benefit most from interventions. The evidence for LNS compared with IFA is promising but limited. There is a need for more homogenous evidence to clarify whether there is a benefit in providing LNS over MMNs.

[1] Small-quantity LNS provides 20 grams of food per day, including 3 grams (9%) of protein and 10 grams (73%) of fat and is meant to complement food in the diet.
[2] Medium-quantity LNS, also known as ready-to-use supplementary food, has traditionally been used to treat moderate wasting and provides between 45 and 90 grams per day of supplementary food, of which 6 grams (10%) is protein and 16 grams (58%) is fat.
[3] Large-quantity LNS, which is also referred to as ready-to-use therapeutic food, has been used to treat severe wasting in children and provides between 180 and 280 grams per day of supplementary food, of which 15 grams (16%) is protein and 28 grams (67%) is fat.

Improved wasting recovery with COVID-19 adapted nutrition treatment in South Sudan

This is a summary of the following paper: *Lyles E, Banks S, Ramaswamy M et al (2023) Acute malnutrition recovery rates improve with COVID-19 adapted nutrition treatment protocols in South Sudan: a mixed methods study. BMC Nutrition, 9, 1, 1–9.*
https://doi.org/10.1186/s40795-023-00696-y

Emergency nutrition programme adaptations were implemented globally as part of COVID-19 mitigation strategies. However, the consequences of implementing these protocol changes at scale, particularly in regions facing worsening food security, have not been comprehensively studied. This study describes the impact of COVID-19 on nutrition programming in South Sudan, utilising a mixed-methods approach. The research analysed programme indicators over time by comparing two periods: 'pre-COVID' (January 2019–March 2020) and 'post-COVID' (April 2020–June 2021).

The researchers conducted a desk review and secondary analysis of facility-level data in South Sudan, focusing on severe and moderate wasting cases. Key indicators included wasting admissions (children aged 6–59 months admitted to outpatient therapeutic programmes and targeted supplementary feeding programmes) and wasting programme exit outcomes (children exiting programmes via recovery, default, death, and non-response – relative to the total number of children in each programme).

The median number of community-based management of acute malnutrition (CMAM) sites in South Sudan increased slightly (+1.85%) during the COVID-19 period. Notably, the analysis of programmatic data from all CMAM reporting sites in South Sudan revealed decreased admissions and improved programme outcomes. For severe wasting, total admissions (-8.2%) and median monthly admissions (-21.8%) both declined during COVID-19, compared to the pre-COVID period. Total moderate wasting admissions increased slightly (+1.1%), while median monthly admissions declined (-6.7%). There were improvements in median monthly recovery rates for both severe (from 92% to 95.7%) and moderate wasting (from 91.5% to 94.3%) across all states. Default and non-recovery rates decreased nationally, while mortality rates remained constant.

It is difficult to attribute declines in admissions to protocol adaptations, as during the pandemic South Sudan experienced concurrent challenges such as flooding, displacement, intensified conflict, and food insecurity, which are all factors that could affect access. States with the largest admission declines also saw reductions in the number of treatment facilities during COVID-19, also suggesting that coverage was a key issue.

The study relies on aggregated facility-level data without individual-level information. This hinders any adjustment for child-level demographic characteristics or nutritional status. Additionally, some sites reported no admissions for extended periods without documentation, which raises the possibility of data inaccuracies. The analysis was also observational, not explanatory, which further limits any interpretation. While the COVID-19 period in this analysis began in April 2020, various protocol revisions occurred at different times and locations beyond this date.

The authors suggest that, in this setting, improved recovery, default, and non-responder rates were observed following the adoption of simplified protocols during the pandemic and that this warrants their continued use. However, given the array of causative and/or confounding factors in this study, any decision on maintaining simplified protocols cannot be based on these findings alone.

Identifying underweight infants and children using a novel 'MAMI' slide chart

This is a summary of the following article: *Monga M, Sikorski C, de Silva H et al. (2023) Identifying underweight in infants and children using growth charts, lookup tables and a novel "MAMI" slide chart: A cross-over diagnostic and acceptability study. PLOS Global Public Health, 3, 8, e0002303.*
https://journals.plos.org/globalpublichealth/article?id=10.1371/journal.pgph.0002303

Using weight-for-age (WFA) as a malnutrition indicator offers several advantages compared to other methods and it is the best indicator of mortality risk for infants aged under six months. However, this method is prone to errors in practice. Building on previous work, the researchers developed a low-cost tool – the "MAMI chart" – which was designed to improve the accessibility and accuracy of WFA assessment (Figure 1).

This study measured how accurately 62 public health/nutrition workers and students could classify 25 hypothetical scenarios where a child's sex, weight, and age were presented – determining whether they were normal weight, moderately underweight, or severely underweight under timed conditions. Participants acted as their own controls by testing the "MAMI chart", then World Health Organization growth charts and lookup tables in a random order.

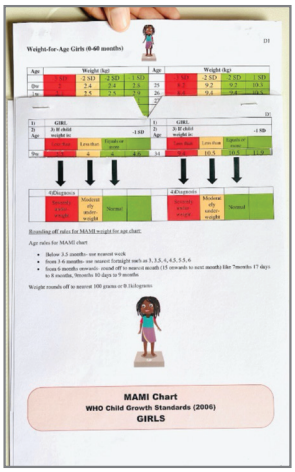
The "MAMI chart" had the highest diagnostic accuracy of the three assessments (79%), with lookup tables (70%) and growth charts (61%) performing worse ($p<0.01$). This difference in accuracy was clinically as well as statistically significant in terms of numbers of infants being correctly identified to receive appropriate treatment. Moreover, most participants reported that they preferred using the "MAMI chart" as it was easier than traditional methods.

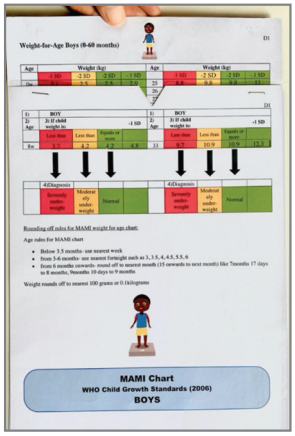
The study featured an appropriate sample size calculation based on previous, comparable studies, but the sample size was smaller than the ideal target due to logistical constraints. This may have left this study underpowered, based on the anticipated effect size, but this issue was negated given that the overall effect size was larger than expected.

The study utilised a robust cross-over study design that eliminated many confounding variables. The sample was comprised mostly of students (45%) and doctors (39%), with 77% of participants having 0–5 years of experience in nutrition or public health. Although the results were comparable across different experience levels, the use of early-career professionals makes it difficult to extrapolate these findings to a broader population. It was also not possible to blind the study participants, which may have introduced bias into the findings.

Although the hypothetical, time-pressured research setting simulated real-world conditions – where clinicians often face large caseloads – the diagnostic accuracies observed are likely to differ from a more natural setting. The values themselves may therefore be of limited use, but the percentage difference between these assessments is important to consider. In this case, the findings indicate that this novel slide chart makes WFA assessment quicker and easier for a relatively inexperienced group of public health professionals. More work is needed to test this tool in different settings, but these findings are promising. The relative inaccuracy of the two existing assessment methods highlights the need for improved training and supervision.

Figure 1
The "MAMI chart" front and reverse sides





Kenya and Malawi: Intestinal disturbances and mortality in complex malnutrition cases

This is a summary of the following paper: *Wen B, Farooqui A, Bourden C et al. (2023) Intestinal disturbances associated with mortality of children with complicated severe malnutrition. Communications Medicine, 3, 128.*
https://link.springer.com/article/10.1038/s43856-023-00355-0

Children with 'complicated'[1] severe malnutrition have particularly high mortality rates. Some evidence points to a relationship between intestinal dysfunction and these poor outcomes, but this has yet to be tested. This nested case-control study sought to evaluate this relationship by testing faecal samples[2] from participants at study admissions (before treatment), then sorting participants by non-survivors (cases) and survivors (matched controls) for analysis.

Subjects were enrolled from an existing randomised controlled trial in Kenya and Malawi (Bandsma et al., 2019) and defined as children (aged 6 months to 13 years), with Mid Upper Arm Circumference (MUAC) <11.5cm, or weight-for-height z-score <-3 (aged 6–59 months) or body mass index-for-age z-score <-3 (age ≥60 months), and/or oedematous malnutrition at any age, and having medical complications or a failed appetite test according to WHO guidelines. Due to the stringent enrolment criteria, the sample size (n=68) was limited by sample availability. The study was randomised at a 1:1 ratio.

Non-survivors had a significantly higher prevalence of nutritional oedema (43%) than survivors (24%, $p=0.02$), with nutritional oedema increasing the odds of mortality by 140% (OR 2.4, 95% CI 1.2–5.1). The proportion of children with diarrhoea was slightly higher in the non-survivor group (54% vs 40%), but there was no significant difference in the odds ratio for mortality (OR 1.8, 95% CI 0.9–3.6). The median time to death for non-survivors was six days (IQR: 4–10). The median time to discharge for survivors was eight days (IQR: 7–11).

There were specific reductions in certain amino acids, monosaccharides, and microbial fermentation products in the non-survivor group. Although short chain fatty acid production – the main fermentation products of the gut microbiome – did not differ between groups, there was a difference in the overall faecal metabolomic signature between survivors and non-survivors. Overall, enteropathy markers did not differ between groups.

This is a small subgroup of particularly sick children, as evidenced by this sample comprising 54% of the mortality cases in the larger parent study, so these findings cannot be generalised to all cases of child malnutrition. The case-control design prevents us from determining the temporal relationship between a cause and an effect, so further studies are needed to validate these findings. The authors also note that the high variability of faecal data may have introduced confounding, although they did take steps to address this. Nevertheless, these findings indicate that intestinal disturbances may have an indirect association with acute mortality.

[1] Complicated malnutrition refers to severely malnourished children who require hospital based management, due to concurrent illnesses or complications.
[2] Faecal metabolomic profiling was performed using nuclear magnetic resonance spectroscopy, targeting 68 commonly measured water-soluble faecal metabolites. A separate portion of the sample was used to measure faecal enteropathy markers.

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Bandsma R, Voskuijl W, Chimwezi E et al. (2019) A reduced-carbohydrate and lactose-free formulation for stabilization among hospitalized children with severe acute malnutrition: A double-blind, randomized controlled trial. PLoS Med, 16, 2.

Adolescent nutrition in Ethiopia: A systematic review and meta-analysis

This is a summary of the following paper: *Abera M, Workicho A, Berhane M et al (2023) A systematic review and meta-analysis of adolescent nutrition in Ethiopia: Transforming adolescent lives through nutrition (TALENT) initiative. PLOS ONE, 18, 4, e0280784.* **https://pubmed.ncbi.nlm.nih.gov/37022989/**

Ethiopia, like many low- and middle-income countries, has undergone rapid economic growth over the last two decades that could influence the diets and nutrition of young people. With concurrent urbanisation and lifestyle transformations, overweight and obesity are emerging as significant problems among the adolescent population, alongside persisting undernutrition in large sections of the population. Although nutritional interventions are growing rapidly in Ethiopia, most of these are targeted to young children, as well as pregnant and lactating women, leaving adolescents a relatively neglected group. This work reviewed studies on adolescent nutrition to inform future interventions and guide policies and programmes for this age group.

The authors performed a systematic search for studies published in English on the prevalence of and interventions for malnutrition in adolescents aged 10–19 years in Ethiopia between 2000 and 2020. The results were checked for quality and rated as low, medium, and high using the Joanna Bridge Institute quality assessment checklists for observational and interventional studies. Seventy-eight studies were eligible for inclusion in the meta-analysis. These documented nutrition outcomes in terms of anthropometry, micronutrient status, dietary diversity, food insecurity, and eating habits.

In the meta-analysis, the pooled prevalence of stunting, thinness, and overweight/obesity was 22.4% (95% CI: 18.9, 25.9), 17.7% (95% CI: 14.6, 20.8), and 10.6% (7.9, 13.3), respectively. The prevalence of undernutrition ranged from 4% to 54% for stunting and from 5% to 29% for thinness. Overweight/obesity ranged from 1% to 17%. The prevalence of anaemia ranged from 9% to 33%. Approximately 40% to 52% of adolescents had iodine deficiency and associated risk of goitre. Frequent micronutrient deficiencies were vitamin D (42%), zinc (38%), folate (15%), and vitamin A (6.3%). About 80% and 60% of adolescents from rural and urban settings respectively were found to have low dietary diversity.

The review showed that undernutrition (stunting, thinness, and micronutrient deficiencies) was more prevalent than overweight. The prevalence of thinness and stunting was higher among boys and rural adolescents, whereas overweight and obesity were higher among girls and urban adolescents. The review also revealed that adolescent food insecurity and low dietary diversity were common. Consequently, a large proportion of adolescents had one or more micronutrient deficiency.

The authors concluded that the adolescent population in Ethiopia faced multiple micronutrient deficiencies and a double burden of malnutrition, although undernutrition was predominant. The magnitude of nutritional problems varied by gender and setting, which calls for context-relevant interventions to effectively improve the nutrition and health of adolescents in Ethiopia.

"Although the prevalence of overweight is low compared to that of undernutrition, it appears that problems of overnutrition were emerging before Ethiopia has dealt with the burden of undernutrition."

Maternal depression and child feeding practices in Malaysia: A driver of malnutrition?

This is a summary of the following paper: *Din M, Teng N & Manaf Z (2023) Maternal depression and child feeding practices: Determinants to malnutrition among young children in Malaysian rural area. Women's Health, 19, 1–10.* **https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9982386/pdf/10.1177_17455057221147800.pdf**

Based on emerging evidence from other settings, the authors hypothesise that there is a relationship between maternal depression and child feeding practices in malnourished and well-nourished children. To test this, a case-control study was conducted in eight health clinics in Kuala Langat, peninsular Malaysia.

"Some research has connected maternal depression to potentially harmful feeding behaviours, such as being less likely to establish boundaries or restrict child intake."

Participants (≥18 years) were sampled from existing district health clinic lists, with 62 mothers of malnourished children selected at random (case) and 62 well-nourished children (control) being assigned. Child age, gender, and residential area were matched between case and control. The case group was defined as any child with weight-for-age (underweight), height-for-age (stunted), and/or body mass index-for-age (wasted) -2SD below World Health Organization growth chart means. Controls were >-2SD to <+2SD for each of these indices. Children were aged 6–59 months and mothers had no co-morbidities. A translated and locally validated questionnaire was used to determine maternal depression status in mothers.

Adjusted odds ratios indicate that children from depressed mothers had more than twice the odds of malnutrition (AOR 2.5, p=0.03). However, the 95% confidence interval was broad (1.08–6.09), so we should also consider other variables to interpret this study.

The authors used the Krejcie and Morgan (1970) table to determine their sample size, a well-used and validated approach. That said, only a 10% dropout rate was accounted for and there was a 17.7% dropout in this study – possibly leaving it underpowered. Body mass index-for-age was also a criterion, which is not considered to be wholly accurate for children aged under 24 months. In this study, children were aged 6–59 months.

Comorbidities, including diagnosed depression, were excluded in this study. By expanding the criteria to include mothers with diagnosed depression as cases, the study may have yielded a greater effect size, increasing confidence in the findings. Although malnutrition was determined by growth charts, this study also measured mid-upper-arm circumference (MUAC). As expected, there is a significant difference (p<0.001) between malnourished cases and well-nourished controls (14.0cm ±1.4 and 15.3cm ±1.4); however, these average MUAC values are higher than standard wasting cut-offs[1]. This may indicate that both groups were closer together in 'malnourished' status, especially wasting, which may well reduce the effect size observed.

The link between maternal mental health and child nutrition status remains underexplored, so this study addresses a valuable question. Unfortunately, the broad confidence interval coupled with methodological shortfalls make it difficult to place too much confidence in these results. The central hypothesis is indeed logical, but this study alone does not provide conclusive evidence of an association and will need to be complemented by other studies, ideally ones that address causality in their design.

[1] World Health Organization MUAC cut-offs for wasting are <12.5cm.

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Krejcie R & Morgan D (1970) Determining sample size for research activities. Educational and Psychological Measurement, 30, 607–610.

Greening nutrition: Integrating environmental screening into GAIN's programmes

This is a summary of the following paper: *Camp O, Remans R & Colston J (2023) Greening Nutrition: Integrating environmental screening into GAIN's programmes. Global Alliance for Improved Nutrition (GAIN).* **https://doi.org/10.36072/wp.36**

Food and nutrition security are highly dependent on the environment, yet current food systems continue to contribute to climate change and degrade the environment on which they depend. In this report, the Global Alliance for Improved Nutrition (GAIN) focuses on the necessity of including environmental considerations in nutrition programmes – not only strategically at a high level, but also operationally – to sustainably address food and nutrition insecurity.

GAIN has designed an 'Environment Screening Tool' to systematically incorporate environmental considerations into its programmes. This tool enables a rapid self-assessment, which identifies environment-related risk factors, prompts mitigation actions, and encourages teams to explore opportunities for environment/nutrition win-wins.

The tool prompts project teams to consider risks and opportunities around ten clustered environmental impact levers likely to be associated with their project and to delve deeper into each of the relevant impact levers[1] to tackle specific impact pathways, risks, mitigation actions, and opportunities for positive impact.

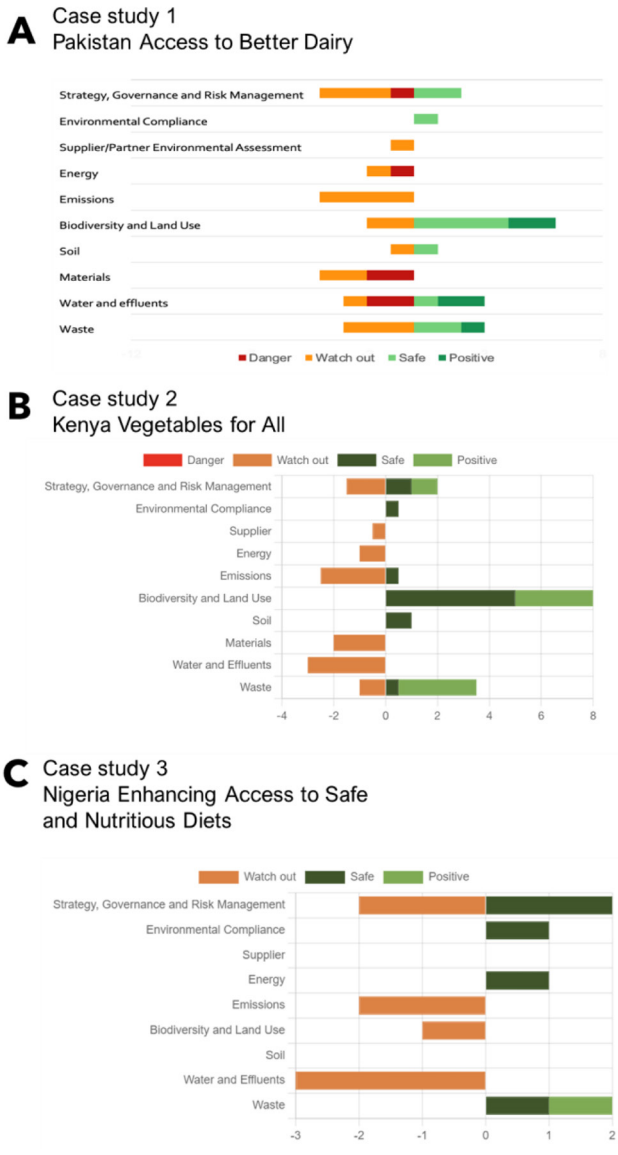
The tool was piloted on ten different nutrition projects that covered various geographies and settings (Pakistan, India, Nigeria, Mozambique, Kenya, and Ethiopia), focused on a diversity of food groups (vegetables, animal-source foods, and biofortified staples), and used different levers of change (workforce nutrition, value chain approaches, business empowerment, and policies, among others). Figure 1 synthesises the scores of the screening tool of three case studies. For each project, at least one area of environmental risk (orange/red) and one of opportunities (green) were identified.

Results indicated that for each pilot project, concrete and actionable entry points to 'green' the project were identified through application of the tool. The environmental levers that were consistent across all ten projects were: governance, compliance, waste, and energy. Some of these opportunities were already included in the original design of the project (e.g., better waste and by-product management), while others surfaced during the screening and co-learning process (e.g., better monitoring and management of what happens with the whey by-product in Pakistan). Potential trade-offs were also identified (e.g., fermentation processes to reduce waste contribute to energy and water use). Several of the mitigation or co-benefit actions fell outside the scope of GAIN's work, which encouraged the identification of potential engagement or partnership with other organisations.

The authors conclude that the tool provides a concrete and feasible entry point for nutrition programmes to connect to the environmental dimension of food systems.

"Trade-offs between nutrition and environment sometimes exist. The tool and related process help make potential trade-offs explicit and visible. This is important to stimulate long-term thinking, planning, and partnerships."

Figure 1 Example of initial screening scores at the design phase



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[1] The ten environmental levers identified to address programme impacts on the natural ecosystem are: 1. Strategy, governance, and risk management; 2. Environmental regulation compliance; 3. Supplier/partner environmental maturity; 4. Energy; 5. Emissions; 6. Biodiversity and land use; 7. Soil; 8. Materials; 9. Water and effluents; 10. Waste.

Tools for working with small, nutritionally at-risk infants: A mixed-methods study

This is a summary of the following paper: *Engler R, McGrath M & Kerac M (2023) Training packages and patient management tools for healthcare staff working with small, nutritionally at-risk infants aged under 6 months: A mixed-methods study. Children, 10, 9, 1496.* **https://www.mdpi.com/2227-9067/10/9/1496**

Small or nutritionally at-risk children are especially vulnerable to mortality in the short term and to morbidity (including poor development) in the long term. However, specific training materials on working with this high-risk group are not widely available. There is a need to determine what exists and where the gaps are for these materials. This two-part study included: a) a scoping review of the literature surrounding existing training packages; and b) a qualitative study with semi-structured key informant interviews providing insights into how training was used and perceived.

Scoping review search terms included: "training tools", "training manuals", "training packages", and "guidelines for training staff working with infants under six months". Training was targeted at different levels, ranging from management staff to frontline healthcare workers. Operational guidelines were excluded. The 'Consolidated Criteria for Reporting Qualitative Research' (COREQ[1]) were used to ensure completeness of the research methods for the qualitative component. A total of nine interviewees were included in the study out of 17 invitations sent. Participants were able to share experiences outside of the key questions, if they seemed relevant to include. Questions revolved around three objectives: awareness of different training available and experience of its use, identification of perceived issues and gaps, and identification of how training could be improved.

The literature review revealed 14 relevant training programmes/patient management tools, which can be found in the original paper. Most were directed at trainers (n=4) and primary health workers (n=5). Three training programmes targeted emergency relief staff: 'Harmonised Training Package'[2], 'IYCF-E Toolkit'[3], and 'Baby Friendly Spaces'[4]. All training programmes addressed mothers and infants, although cMAMI[5] was the only tool that specifically targeted small and nutritionally at-risk infants under six months.

The main issues and gaps revolved around counselling skills for breastfeeding and mental health, ongoing monitoring, follow-up trainings, and emergency preparedness. There was also a lack of fixed, well-defined assessment criteria, which are important to identify admission and discharge cut-offs. It was outlined that changes in assessment criteria, from weight for height to MUAC or weight for age, still create confusion as to which measure should be used. Additionally, few training resources covered anthropometric assessment.

The authors acknowledge that this was not an exhaustive systematic review, and thus that their study can only provide an idea of the gaps in evidence and falls short of a comprehensive review of resources. Non-probability (purposive) sampling was used to select professional contacts via the MAMI Global Network[6]. This sampling method does introduce selection bias, but it was necessary for this specific research question to be addressed efficiently – so this was unavoidable. The sample size for interviews was small, although varied, and a larger group may have been impractical given the detail required from each participant. Nonetheless, there was a lack of interviewee experience with the 'Baby Friendly Spaces' tool, which would have been valuable.

The authors highlighted several themes for improvement, such as the need for training programmes to be comprehensive, context specific, and employ a variety of delivery methods (e.g., lectures, group simulations, clinical practice, etc.). The authors also concluded that:

"It would be useful to have a core curriculum and package endorsed by a respected and authoritative organisation. However, any such package should have options for adaptations and local adjustments"

[1] https://academic.oup.com/intqhc/article/19/6/349/1791966
[2] https://www.ennonline.net/htpv2module17
[3] https://resourcecentre.savethechildren.net/document infant-and-young-child-feeding-emergencies-iycf-e-toolkit-rapid-start-emergency-nutrition/
[4] https://www.actionagainsthunger.org/publications/baby-friendly-spaces-technical-manual/
[5] https://www.ennonline.net/c-mami
[6] https://www.ennonline.net/ourwork/research/mami

Using SMS platforms to support 'Family MUAC' in Kenya

This is a summary of the following paper: *Tickell K, Achieng C, Masheti M et al. (2023) Family MUAC supported by a two-way SMS platform for identifying children with wasting: The Mama Aweza randomised controlled trial. The Lancet, 64.* **https://www.sciencedirect.com/science/article/pii/S2589537023003954**

This randomised controlled trial investigated the 'Manually Administered Malnutrition Monitoring System' (MAMMS) – a Family Mid-Upper Arm Circumference (MUAC) approach supported by a two-way SMS messaging platform – to determine whether this intervention affected time-to-diagnosis (wasting), the severity of illness, and the duration of treatment in children. Eligible participants were children aged 5–12 months with MUAC of 12.5–14.0cm. Children with MUAC <12.5cm and/or nutritional oedema were referred to nutritional services for treatment. The study period was between 1 August 2019 and 31 January 2022 and follow-up measurements were taken at six months.

The MAMMS group (n=599) received weekly automated texts, which included a validated, locally tailored health education message and a reminder to measure their child's MUAC and send the result via SMS. Community health workers and nutritionists then reviewed these messages and requested any children with moderate or severe wasting to be taken to a clinic for treatment. The control group (n=601) received standard care based on existing "gold standard" community-based management of acute malnutrition treatment, with active and passive case finding, to ensure the MAMMS group was compared with a strong community screening programme.

Wasting incidence over six months was 37% lower in the intervention group (HR 0.63, p=0.02). For those who became wasted, the median number of days-to-diagnosis was comparable between intervention and control groups, at 63 and 58 days respectively. Average treatment coverage was different between intervention (83.3%) and control (55.6%) groups, but not significantly so (p=0.30) due to large, overlapping confidence intervals (95% CI 39.9-100 and 22.3-88.9, respectively). Mean MUAC at diagnosis and mean treatment duration were comparable between groups.

Anthropometric measurements were taken independently by researchers and caregivers to validate these measurements. This increases our confidence in the accuracy of these outcome variables, especially as all caregivers successfully passed this validation process. Caregivers were excluded from the study if they planned to move from the study area or if their child was acutely unwell and required hospitalisation. These are practical considerations, but it is plausible that children from those mothers had a particularly high risk of wasting and were not captured in this study. Dropout rates were broadly comparable for both study groups (≈10%), as were the various baseline health and demographic characteristics of each group, increasing the validity of this study.

Although this study occurred in a high-literacy, agriculturally productive Kenyan setting – which makes it hard to generalise these findings – the results of this trial show a clear benefit of the MAMMS intervention on wasting incidence. The study employs a robust methodology and there is a plausible mechanism for its success. Findings suggest that Family MUAC supported by two-way SMS offers an alternative or addition to door-to-door active screening as well as a potential method to reduce the risk of moderate wasting.

For more information, please contact Kirk Tickell at **kirkbt@uw.edu**

Modifiable risk factors for child stunting in sub-Saharan Africa

This is a summary of the following paper: *Ahmed K, Dadi A, Ogbo F et al. (2023) Population-modifiable risk factors associated with childhood stunting in sub-Saharan Africa. JAMA Network Open, 6, 10.* **https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2810821**

Demographic and Health Survey data from 2014–2021 was analysed from 25 sub-Saharan African countries, providing a study population of 145,900 children aged under five years. The aim of this cross-sectional study was to determine the modifiable risk factors associated with childhood stunting. Across the 25 countries, survey design and data were consistent, as they were based on standardised DHS data collection methods and survey tools. Data was obtained from eligible women: females aged 15–49 years residing permanently or visiting the household on the night before the survey.

Stunting (<-2SD) and severe stunting (<-3SD), defined using height-for-age z scores from WHO standards, were the primary outcomes. Modifiable risk factors examined included child, maternal, and household factors. As well as reporting relative risks for each risk factor exposure, adjusted for confounding, the study also presents Population Attributable Fractions (PAF) – the proportional reduction in stunting if exposure to risk factors were reduced – which are utilised in this summary. Relative risk, which may be more intuitive for some readers to interpret, can be found in the original paper.

In the two weeks preceding the survey, 15.1% of children had episodes of diarrhoea (≥3 episodes per day), roughly 84.6% did not consume dairy products in the past 24 hours, and 39.4% of mothers did not attain a formal level of education, with 66.6% unemployed. Over half of children (55%) lived in households without an improved toilet system and 63.9% were born at health facilities. Mean overall stunting prevalence was 30.6%, ranging from 55.8% (Burundi) to 17.1% (The Gambia). Overall severe stunting prevalence was 10.5%, ranging from 24.8% (Burundi) to 3.5% (The Gambia).

A lack of childhood dairy consumption (PAF 15.1%), mothers with only primary education (PAF 8.1%), unclean cooking fuel (PAF 9.5%), and low-income household (PAF 5.4%) were the largest risk factors for stunting. When combined, these four risk factors were associated with 40.7% (95% CI 34.0–47.2) of stunting cases.

"The combined PAFs showed that 51.6% (95% CI 40.5–60.9) of cases of severe childhood stunting in sub-Saharan Africa were associated with no formal education among mothers, children lacking dairy products, unclean cooking fuel, home birth, and low-income household."

– Ahmed et al., 2023

The authors note that this may be the first time that PAFs have been used to estimate childhood stunting in this setting, with this measure offering a clear picture on where the most efficient interventions can be targeted. We can clearly see that some risk factors have an 'outsized' impact on childhood stunting, so these should be prioritised in a tight funding environment. The use of nationally representative Demographic and Health Survey data increases the generalisability of the results to the region; however, more specific, locally available data will always provide a more nuanced picture. Nonetheless, this large-scale study offers a useful first step for policymakers and programmers to consider.

Initiating Infant and Young Child Feeding in Emergencies Programming, Ukraine 2022

This is a summary of the following paper: *Emergency Nutrition Network (2023) Lessons learned from initiating infant and young child feeding in emergencies programming for the Ukraine response in 2022.* **https://www.ennonline.net/attachments/4986/IYCF-E-Ukraine-response-lessons-learned.pdf**

This article summarises a recently published case study prepared by Isabelle Modigell (ENN consultant) in which 15 individuals were interviewed (69% Ukrainian nationals) and a further 22 Ukrainian breastfeeding counsellors surveyed to capture lessons learned during the initial six months of the response (February-August 2022).

The Russian Federation's full-scale invasion of Ukraine in February 2022 resulted in the largest and fastest displacement of people in Europe since World War II, the majority of which were women and children. The nature and scale of the crisis required innovative approaches by the humanitarian community.

Some of the findings from the case study revealed that:

Infant and young child feeding in emergencies (IYCF-E) was deprioritised within the international response despite early advocacy and a plea for support from Ukrainian breastfeeding counsellors at the start of the war.

Coordination mechanisms were inadequately resourced and understaffed. However, Ukrainian breastfeeding counsellors used Facebook and Telegram to coordinate themselves and map their locations to support referrals.

IYCF-E was not part of early multisectoral rapid needs assessments, thus understandings of needs were often based on a limited number of ad hoc consultations with particularly vulnerable mothers with greater exposure to breastmilk substitute (BMS) donations.

There was a lack of consensus on needs, particularly around estimates of infants needing BMS, with controversies surrounding the data used. When asked, 62% (n=13) of national breastfeeding counsellors surveyed did not feel listened to by the international response community.

Breastfeeding counsellors who were surveyed relied on lactation professional associations and networks for technical support. Knowing that assistance was available from international colleagues raised morale.

There was poor understanding by international responders of existing local breastfeeding support cadres and services. Pre-war, there were hundreds of locally certified breastfeeding consultants and peer counsellors, regional breastfeeding support centres and a strong network of mother-to-mother support groups. The recruitment and rapid training of new counsellors by INGOs, as well as international offers for remote counselling supported by translators, was therefore deemed unnecessary by some key interviewees. Five out of nine Ukranian survey respondents felt their expertise was not recognized or leveraged by international organisations.

Remote support was impactful. In February 2022, two free-of-charge Telegram groups were established. By 2023, they had reached over 7,000 women, offering 24-hour support by volunteer breastfeeding consultants, paediatric specialists, and psychologists.

There was an "avalanche of donated BMS". Those consulted regarded the supply-driven donations and untargeted distributions as a major distraction, a misuse of financial resources, and harmful. Both local and international responders desired urgent guidance to address the issue, which UNICEF Headquarters subsequently provided.

Safer alternatives to BMS were reported, such as wet nursing and informal milk sharing in cases of necessity. The Kyiv Perinatal Centre's human milk bank continued to operate and in 2022, 2010 infants received donor human milk. Due to limited evidence on operating human milk banks in emergencies, learning from Ukraine's experiences is recommended.

Psychological assistance was found to support lactation and facilitate exclusive breastfeeding. Breastfeeding counsellors supported stressed mothers by suggesting simple somatic exercises for nervous system regulation and caregiver-infant co-regulation.

The IFE Core Group identified a need for comprehensive guidance in case of a nuclear accident which balanced risks of radiation exposure against risks of not breastfeeding. Health workers appreciated the subsequently developed guidance for its level of technical detail and clear, practical instructions by recognised experts.

The case study showed remarkable examples of national solidarity and continued breastfeeding support during a major emergency while also reflecting on some of the shortcomings of the international response.

Integrating climate and nutrition

This is a summary of the following report: *GAIN (2023) Accelerating action and opening opportunities: A closer integration of climate and nutrition 2023 I-CAN baseline assessment.*
https://www.gainhealth.org/resources/reports-and-publications/accelerating-action-and-opening-opportunities-closer-integration-climate-and-nutrition

Ahead of the UN Climate Change Conference (COP 28) in the United Arab Emirates, this report assesses the current integration of climate and nutrition and opportunities to act more cohesively.

The Initiative on Climate Action and Nutrition (I-CAN) is a multi-stakeholder, multi-sectoral global flagship programme formally launched at COP 27. For this baseline assessment, I-CAN selected 20 indicators. Using 13 of these indicators, this analysis uses four 'levels' to assess the degree of integration between climate and nutrition, from no integration (level 1) to strong integration (level 4). This four-level approach provides a straightforward way to present over 1,500 data points across indicators, which would be too large to outline individually. Despite the wealth of data to penetrate, there are some key takeaways that can be lifted from this report.

Integration within national plans is limited

Nationally Determined Contributions[1] (NDCs) showed the lowest levels of climate–nutrition integration and just 2% scored in the highest level of integration (level 4). National Adaptation Plans[2] (NAPs) fared slightly better (16%) and National Nutrition Plans were more closely integrated with climate (28%) – but all are clearly lacking. The report found that 60% of NDCs achieved 'level 1', which indicates that there is no intention to connect climate and nutrition. This may reflect that, under the 2015 Paris Agreement, country commitments have focused on emissions reduction and therefore more heavily on issues such as land use, pollution, and energy.

Data and knowledge transfer remain poor

In the 2022 Global Nutrition Report[3], 95% of stakeholder commitments that are monitored do not consider climate or sustainability in any way. In total, 38% of data and knowledge portals had no links (level 1) between climate and nutrition. However, recent Intergovernmental Panel on Climate Change reports did score 'level 4', indicating that there were many in-depth considerations of nutrition within them. This could offer a blueprint for other actors working in the capacity building, data, and knowledge transfer areas.

A paucity of policy data

Data on the number of food-based dietary guidelines that include climate considerations and the number of countries factoring climate into food procurement decisions was generally limited. The authors therefore noted that this area may fare better than the analysis implies. Yet, 54% of food-based dietary guidelines and 83% of food procurement policies scored 'level 1' – which is again disappointing.

Investment is poor

From 2021 to 2022, just 3% of Green Climate Fund grants included interventions addressing nutrition interventions (level 4). Fewer than 1% of projects (2018–2022) included both climate and nutrition themes.

Summary

Climate change and nutrition are inextricably linked, but this report shines a spotlight on the lack of progress that governments and actors are making on integration. In many cases, across multiple policy areas, there is an intention to act. However, this intention is yet to result in coherent, robust action – apart from in a few outlier countries.

[1] NDCs are non-binding national climate mitigation plans that contribute to achieving the global goals set out in the Paris Agreement. Broadly speaking, these plans aim to limit and/or reduce damage to the ecosystem.
[2] NAPs aim to identify medium- and long-term adaptation needs (e.g., developing flood defences in low-lying areas) for countries, with the process outlined by the 2010 'Cancun Agreements'. Broadly speaking, these plans aim to modify settings to be more resilient to existing climate challenges.
[3] https://globalnutritionreport.org/reports/2022-global-nutrition-report/

Global Report on Food Crises 2023

This is a summary of the following report: *Food Security Information Network (2023) 2023 Global Report on Food Crises.*
https://www.fsinplatform.org/report/global-report-food-crises-2023/

The 7th iteration of the annual Global Report on Food Crises (GRFC) was published in 2023 and contains a comprehensive analysis of acute food insecurity across regional, national, and sub-national levels during 2022. A full breakdown of the findings and methods employed in this technical, evidence-based, 213-page report is beyond the scope of this summary, but some of its key themes are explored below. The report draws on data from 2022 with the support of 16 GRFC partner organisations. Data was drawn predominantly from the Integrated Food Security Phase Classification[1] (IPC) or the Cadre Harmonisé[2] – among others.

Almost 258 million people across 58 countries were in 'crisis' or food insecurity (IPC Phase 3 or above). This is a marked increase on the previous year (193 million across 53 countries), even when accounting for global population increase during the same period.

The lingering effects of the COVID-19 pandemic were an effect multiplier for, if not a direct cause of, many recurrent shocks. Economic shocks were the main driver of acute food insecurity in 27 countries – with the war in Ukraine being a key upstream factor. The war, arriving shortly after the macroeconomic fallout of the COVID-19 pandemic, has exerted a domino effect on other countries due to Ukraine and Russia's contribution to global fuel, fertiliser, wheat, maize, and sunflower oil production. This creates ongoing market volatility, with the hyperinflation of staple foods now present in multiple territories.

Conflict and insecurity were the direct drivers of acute food insecurity across 19 countries, with weather extremes – predicted to increase in severity and frequency in the coming years – being the primary driver in 12 countries.

Despite this global burden, the report highlights the 'hotspot' nature of such crises, with over 40% of the IPC Phase 3 or above population residing in just five countries: the Democratic Republic of the Congo, Ethiopia, Afghanistan, Nigeria, and Yemen. When looking at the share of food insecurity by the analysed population of each country, the findings are sobering – around half the populations of Yemen (55%), Syria (55%), Afghanistan (46%), and Pakistan (43%) were food insecure.

People in seven countries faced 'catastrophe' (IPC Phase 5): Somalia, South Sudan, Yemen, Afghanistan, Haiti, Nigeria, and Burkina Faso. More than half of these 376,400 people were in Somalia (214,100).

> ***"Conflicts and mass displacement continue to drive global hunger. Rising poverty, deepening inequalities, rampant underdevelopment, the climate crisis, and natural disasters also contribute to food insecurity"***
> – António Guterres, in a foreword to the report

Despite these findings, the report also sheds light on possible solutions – particularly earlier intervention to reduce food gaps and to protect livelihoods, as prevention is more cost-effective than a later, crisis-oriented response. However, traditional funding cycles and the broader humanitarian and political economies often focus on the latter model, creating further challenges.

[1] https://www.ipcinfo.org/
[2] https://www.ipcinfo.org/ch/

State of school feeding worldwide 2022

This is a summary of the following report: *World Food Programme (2023) State of School Feeding Worldwide 2022.*
https://www.wfp.org/publications/state-school-feeding-worldwide-2022

In 2022, two years after the onset of the COVID-19 pandemic, the World Food Programme assessed the global state of school feeding. This assessment utilised national surveys to examine key aspects of health and nutrition coverage and implementation practices in schools. The report analysed changes between 2020 and 2022 – with the final report being published in March 2023.

The pandemic highlighted the need for governments worldwide to invest in the education and general well-being of their children and teenagers, as well as the necessity of developing national policies that guarantee both a good education and high-quality health and nutrition services provided in schools.

In 2022, data from 176 countries indicated that approximately 418 million children benefited from school feeding programmes globally, a slight increase from 388 million in 2020. However, low-income countries (LICs) experienced a 4% reduction in the number of children receiving school meals.

Around 41% of children enrolled in primary school benefit from school meal programmes globally. The coverage varies greatly with income level: approximately 18% of schoolchildren in LICs receive free or subsidised school meals, compared to 39% in lower-middle-income countries and 48% in upper-middle-income countries.

Financial landscape analysis found that external donor support for investing in the well-being of children and adolescents does not respond to the priority that national governments give to these programmes. Despite limited fiscal resources, LICs increased their domestic funding for school meals (from approximately 30% in 2020 to 45% in 2022), while donor support decreased (from around USD 267 million in 2020 to USD 214 million in 2022).

The report indicates that governments were increasingly recognising the importance of formalising school meal programmes into institutional policy and connecting them with other health and nutrition initiatives. In 2022, 82% of LICs had a school meals policy (compared to 73% in 2020) and, overall, more than 87% of all countries had specific school feeding policies in place (compared to 79% in 2020).

The 'School Meals Coalition', a collaborative effort, has gained prominence and involves 76 countries representing diverse economic levels (and 58% of the world's population). It has helped restore programmes to pre-pandemic levels, especially in low- and middle-income countries. The Coalition, through partner-led initiatives, aims to address three key challenges: improving evidence for decision-making, ensuring sustainable financing, and enhancing data reliability.

The primary challenge at present lies in the limited effectiveness of recovery efforts, especially in LICs where coverage is inadequate despite being most needed. Addressing this challenge necessitates a new agreement that adapts to the shift toward increased country ownership and funding to augment support for school meal programmes.

Moreover, there exists an opportunity to harness the school meal platform to promote climate-smart and sustainable food systems, ultimately leading to improved nutrition and greater dietary diversity. Climate-smart school meal programmes could serve as pioneers in countries' efforts to enhance climate resilience – fostering diversified diets, aligning agriculture and procurement with local food sovereignty, and rethinking energy and farming practices.

Home-grown school feeding in Garowe, Somalia

Field Exchange
Emergency Nutrition Network

ENN CEO: Nigel Tricks

ENN Directors: Marie McGrath, Tanya Khara

Operations Team Support: Emily Cracknell, Hannah Fletcher, Holly Ruffhead, Laura Delfino, Nicola Johnstone

Design: Orna O'Reilly
Big Cheese Design.com

Website: Oxford Web Applications

Contributors for this issue:
Abigail Conrad
Alyssa Klein
Amelia Giancarlo
Brenda Phiri
Britt Titus
Carla Pramila Lopez
Didier Bertrand
Emily Keane
Guleid Mahdi Mohamed
Hadiara Souley
Hawa Diarra
Jean Nkhonjera
Jen Burns
Jennifer Nielsen
Lisa Sherburne
Lorenzo Testa
Lucas Nene
Mamoudou Djibo Khaled
Maria Michela Morese
Marie McGrath
Mohammed Ismail Mahamoud
Monique Chan-Huot
Natalie Roschnik
Olita Mulewa
Patrizia Fracassi
Phindile Lupafya
Phonevilay Santisouk
Saeed Mohamood Soleman
Said A Mohamoud
Shaneka Thurman
Shelagh Possmayer
Sophie-Anne Sauvegrain
Takondwa Minjale
Tiziana Pirelli
Tomoko Kato
Vanphanom Sychareun
Vilamon Chanthaluesay
Yuusuf F Yuusuf

Cover
Children learn to grow their own vegetables in the school garden, which are then used in the canteen to prepare meals. © WFP/Patrick Mwangi

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.

Field Exchange Team


Anne Bush
Editor


Nicki Connell
Editor


Philip James
Editor


Gwénola Desplats
Guest Editor


Thomas Stubbs
Content Coordinator


Natalie Sessions
Sub-Editor


Stephanie Wrottesley
Sub-Editor


Eilise Brennan
Sub-Editor


Amir Samnani
Sub-Editor


Orna O' Reilly
Design and Production

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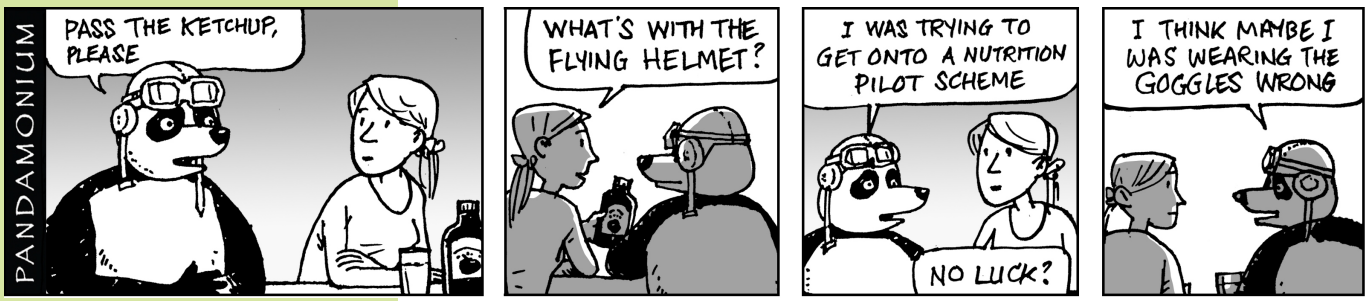

ENN
2nd Floor, Marlborough House, 69 High Street,
Kidlington, Oxfordshire, OX5 2DN, UK

Tel: +44 (0)1 865 372340
Email: office@ennonline.net

www.ennonline.net