

Field Exchange

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Emergency Nutrition Network



70th Edition

Nutritionists' experiences and reflections from across the globe

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A health worker in Oromia conducting a routine check up with Birke Mulugeta, who is nine months pregnant. Ethiopia.

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Dear readers,

Welcome to the 70th edition of Field Exchange. This edition features a diverse range of articles that we hope will stimulate your interest and engagement.

We feature two articles on the theme of classification of nutritional status with implications for admission to appropriate care. There are considerable research and knowledge gaps regarding the optimal maternal mid-upper arm circumference (MUAC) cut-off thresholds to identify poor birth and maternal outcomes. A scoping review by Kapil and Ververs ([page 28](#)) finds that a MUAC cut-off threshold of <23 cm performs well as a screening tool for identifying pregnant women at risk of adverse birth outcomes, particularly low birthweight. For children, findings from Fayyaz et al ([page 17](#)) highlight the impact of imprecise age data recording on classifying malnutrition status according to weight-for-age. Inaccurately rounding ages, even by just a few months, can lead to biased underweight estimates with implications for the identification and optimal treatment of children with the greatest mortality risk. The authors propose several 'imperfect' solutions, concluding that ultimately the ubiquitous use of birth certificates may be needed.

Three articles link to the theme of infant and young child feeding. Atuman et al ([page 14](#)) describe how father-to-father support groups were found to have a positive impact on infant and young child feeding practices in northern Nigeria. Despite the promising results, a major challenge was the sustainability of the approach given the context of strong cultural norms and competing priorities of fathers as the main household providers. This limited the scope for continual engagement beyond the programme phase.

An article by Fleming et al ([page 23](#)) presents the results of a study on young children's feeding practices in mandatory quarantine facilities during the COVID-19 pandemic in Australia. Even in such a high-income country, the provision of optimal young child feeding in this closed emergency setting was woefully inadequate. This indicates that such problems are not necessarily due to resource constraints but, rather, symptomatic of a broader failure to understand and deliver age-appropriate responsive child feeding in such settings. Better uptake of existing infant and young child feeding in emergencies operational guidance is needed alongside the development of clear minimum standards and adequate staff training for the provision of optimal young child feeding in any setting where people are constrained in resourcing their own food, such as protracted and acute crises.

Infant feeding in emergencies remains an under-researched area. A qualitative study by Addison ([page 20](#)) explores practitioners' perceptions of research priorities concerning infant and young child feeding in emergencies that were outlined in 2016. It finds seven out of 10 of the priorities to still be largely relevant. This article was adapted by the author from her original student dissertation project; we encourage other students to submit their own dissertations for consideration for publication, as part of our commitment to engaging with early career professionals.

With humanitarian crises sadly on the rise, good practice in such contexts remains critically important. The Grand Bargain – an agreement to reform the delivery of humanitarian aid – was launched in 2016 with a key commitment of increasing localisation within humanitarian assistance. Since then, progress towards this commitment remains poor overall.¹ Munikwa et al's article ([page 10](#)), however, illustrates how encouraging the engagement of local partners and extending their geographical coverage was instrumental in scaling up the nutrition response in a challenging and insecure context in northern Ethiopia. In a letter to the editor, Rahimov et al ([page 4](#)) bring to light the benefits that rationalisation of services has brought to the nutrition response in the Rohingya refugee camps in Cox's Bazar.

A views piece by Humphreys and Heymsfield ([page 7](#)) challenges us all to look at the way in which we use images of children in our work, particularly in humanitarian contexts, and provides illustrations of better practice. For example, the authors suggest we can use examples from nutrition assessments, where images of children can be replaced with alternatives focused on the work of survey teams and the survey context. We support the view

of the authors and provide a short postscript to the article with our reflections.

A publication in our last edition of a cost-efficiency analysis of wasting treatment in Indonesia suggested scale-up efforts should prioritise increasing coverage in high-burden areas. In this edition, analysis from Mali by Lee and Ouedraogo ([page 25](#)) suggests that treating severely wasted children with a simplified protocol may be more cost-efficient than with a traditional protocol.

As usual, we publish an array of research summaries. Among these, we feature the recent *Lancet* series on small and vulnerable newborns accompanied by an engaging, thought-provoking views article – based on a recent blog post – by Marie McGrath ([page 5](#)), in response to the *Lancet* series authors' call for action.

Three other summaries highlight the current bleak global picture for child malnutrition and food insecurity. Not enough progress has been made in reducing malnutrition across the globe (303), while the increasing pace of urbanisation is blurring the distinction between urban and rural differences, making it vital that food systems recalibrate to address the new challenges this presents to food insecurity and malnutrition (304). In the meantime, acute food insecurity is projected to deteriorate further in 22 countries between June and November 2023 ([page 41](#)).

Finally, we also feature a summary of the revised World Health Organization guidelines on the management of acute malnutrition ([page 40](#)), with more to come on this in the next edition of Field Exchange.

Happy reading!

¹ Metcalfe-Hough V, Fenton W & Manji F (2023) The Grand Bargain in 2022: An independent review. HPG commissioned report.



A pregnant woman receiving Mid-Upper Arm Circumference (MUAC) assessment at an antenatal clinic. Sudan.

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Dear editors,

In 2022, we published an article outlining the rationalisation of nutrition services in Cox's Bazaar as part of Field Exchange issue 67.¹ The article explored how bringing nutrition services together as a 'one-stop shop' – or 'one camp approach' – yielded positive results for those residing in these camps, where a complex set-up of various agencies and programmes was operating. Rationalisation targets this multi-layered set-up and looks to implement common strategies across actors to ensure that refugees have equitable access to all basic services.

"Nutrition service rationalisation is recommended as it not only provides an opportunity to integrate multiple services, including for the nutrition (Outpatient Therapeutic Programme, Targeted Supplementary Feeding Programme, Blanket Supplementary Feeding Programme), it also supports a disability-friendly environment and allows the mainstreaming of gender and other protection services through a single programme"

– Rahimov et al., 2022

In this letter, we return to Cox's Bazaar to explore the recently compiled and analysed results of the formative evaluation of the nutrition service rationalisation in the Rohingya Refugee Camps. We hope this letter guides colleagues in shaping humanitarian nutrition reforms in their respective countries based on our experiences in Bangladesh's Cox's Bazaar refugee camps.

The nutrition sector's coordination unit, with the support of UNICEF, the United Nations High Commissioner for Refugees (UNHCR), and the World Food Programme (WFP), and with the agreement of all implementing partners and government stakeholders, ran a formative evaluation of the nutrition sector's performance by comparing pre- and post-rationalisation periods. The main objective of running the evaluation was to understand how the beneficiaries of the nutrition services accepted the rationalisation.

The evaluation, conducted by the Centre for Injury Prevention and Research, Bangladesh, highlighted that most interviewed mothers (62.6%) assessed the quality of nutrition services as 'good' or 'very good' in the pre- and post-rationalisation periods – illustrating that once a child or mother is admitted for nutrition treatment, the quality of services was viewed positively both before and after service rationalisation. However, mothers also mentioned that any confusion, which sometimes occurred when selecting nutrition facilities, was eliminated once this number was reduced and integrated under the single roof of the integrated nutrition facility.

Service providers (i.e. international and national non-government organisations operating under the UN agreement) mentioned that rationalisation ended the sharing of camp services between multiple implementing partners. Before rationalisation, there was no clear segregation of blocks and sub-blocks (units for dividing the camp) within the same camp between implementing partners. Rationalisation stopped the

overlap of nutrition services by introducing a single partner per camp. As such, conflicts between service providers, service duplication, and double reporting – which can all occur when sharing service space – were eliminated.

The beneficiaries indirectly appreciated the service rationalisation by mentioning the reduced number of repetitive home visits by the different NGOs covering the same subjects or aims – with 99 (24.4%) respondents stating they were 'very happy' with the reduction and a further 292 (71.9%) stating the change was a 'good' thing.

It was also essential to capture the views of nutrition facility staff in the camps. Staff noted that the rationalisation did not change the already high quality of the in-facility services. This conclusion was confirmed by a previously published analysis, featured in Field Exchange 67,¹ of nutrition facility performance. Of 406 interviewees, 306 (75.4%) service providers agreed that no change in in-facility service quality was observed after the service rationalisation.

The formative evaluation also touched on the COVID-19 pandemic period, which changed regular nutrition service provision in the Rohingya camps. Frontline service providers adjusted, adopted, and followed up the different nutrition service delivery approaches, including campaigns.²

We hypothesised that, as rationalisation eliminated the duplication of the community outreach activities, this minimised the level and frequency of contacts and thus supported pandemic social distancing practices. COVID-19 infection control measures were also easier to monitor in the reduced network of nutrition facilities by concentrating more resources on the single nutrition point. This helped to keep all nutrition facilities open during the peak of the pandemic. Most nutrition service clients (97%) answered that services were not disrupted during the COVID-19 outbreak. All children and mothers received necessary nutrition treatment even during the complete lockdown in the camps.

Both the quantitative and qualitative analyses of the nutrition sector rationalisation confirmed the following:

The nutrition sector rationalisation discontinued duplication and, as a result, stopped double counting of the community outreach services provided. A single partner per camp ensures the delivery of channelled comprehensive essential and integrated (Outpatient Therapeutic Programme, Targeted Supplementary Feeding Programme, and Blanket Supplementary Feeding Programme) nutrition services.



Counseling at camp 8W integrated nutrition facility, Cox's Bazaar, Bangladesh.

©Syed Mohammad Tahsin, ISCG

The beneficiaries appreciated the service rationalisation for discontinuing repetitive home visits by several service providers covering similar subjects.

The beneficiaries mentioned the improved clarity in regard to selecting the relevant nutrition facility, as all services are concentrated under the single roof of the integrated nutrition facility.

The quality of in-facility services remains the same before and after the nutrition service rationalisation, which was confirmed both by service providers and beneficiaries.

The success of service rationalisation has multiple connected components. In the case of Cox's Bazaar, the presence of clear, long-term United Nations funding was essential. Besides the funding, the strong and continuous cooperation commitment of each United Nations partner in the nutrition cluster encouraged a win-win scenario for stakeholders. This may not be feasible in other settings. Therefore, rationalisation should be carefully studied before initiating such a change.

Furthermore, we believe the evaluation allowed national institutions to be trained in UNICEF's programme evaluation methods. Relevant UNICEF staff worked closely with the research institution, and the experience demonstrated that the approach could also extend national programme evaluation capacity in Bangladesh – building stronger systems for the future.

Sincerely,

Bakhodir Rahimov, Chief of Field Office, UNICEF Poltava, Ukraine (former Nutrition Sector Coordinator for the Rohingya crisis).

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The authors express their deep gratitude to all UN agencies supporting the nutrition response in Rohingya camps – including UNICEF, UNHCR, and WFP. In addition, the authors thank the Civil Surgeon's offices and the Refugee Relief and Repatriation Commissioner in Cox's Bazaar, Bangladesh. Also, we want to give special thanks to all implementing partners, staff of the integrated nutrition facilities, and people contributing to the evaluation.

¹ <https://www.enonline.net/fex/67/nutritionservicesrationalisationcxb>

² <https://www.enonline.net/fex/63/cxbvitaminasupplementation>



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A mother practicing Kangaroo care, at the Regional Hospital of Korhogo, Côte D'Ivoire.

The *Lancet* 'Small vulnerable newborns' series:

Reflections from a 'MAMI' perspective



Marie McGrath is a Technical Director at ENN and co-Chair of the MAMI Global Network.

What we know:

This year's *Lancet* series on small vulnerable newborns ([page 38](#)) draws attention to a preventable truth – around a quarter of babies born alive face one or more of three vulnerabilities: born too soon, born too small, or born with low birth weight.

What this adds:

This article reiterates a blog Marie McGrath posted on 7 June 2023¹ responding to the authors' call for action. Having featured a critique of calls for action in the last edition of *Field Exchange*,² this is one that looks like it is warranted.

The recent *Lancet* series on small vulnerable newborns (SVN) comprised three hearty papers of evidence and analyses and a call for action to prevent babies being born dead, too early, and too small.

Figuring out the care of these tiny babies and their mothers has been my primary worry and professional focus for the past 14 years, so I dived in with interest. Here are a few of my gut reactions.

Connecting SVN and wasting actions: Don't miss this trick

Reducing SVN burden will reduce malnutrition caseloads. The new SVN conceptual framework shared in Figure 2 of Paper 1 (Ashorn et al, 2023) reflects how the SVN of today are the wasted, stunted, and underweight babies of tomorrow. Paper 4 (Hofmeyr et al, 2023) estimates that increased coverage of eight proven health and nutrition interventions would reduce stunting by 2.9% in 81 countries by 2030.

Which makes me think – why not extend the analyses for wasting and underweight? This would help hammer home that SVN prevention is critical to achieving nutrition targets and really help join forces with the nutrition world. Doing so will be pushing an open 'nutrition' door: one of the targets of the Global Action Plan on Child Wasting (UNICEF et al, 2023) is to decrease low birth weight (LBW) and reduce wasting prevalence to less than 3% by 2030 (SDG 2.2). Reduction in LBW is one of four critical outcomes that national operational plans³ set to translate these international commitments into national action. This process offers a critical window for multi-speciality co-action around women's and infant's health and nutrition. A bit more data and you'll be invited right in!

Around 35 million small vulnerable babies: Acting now to mitigate risk

The focus of this series is on critical prevention. While we act to prevent, what to do

with the estimated 35 million SVNs already (and continuing to be) born is something we need to also address right here, right now. They are at increased risk of death and poor growth and development. How do we handle that? The Management of small and nutritionally at-risk infants under six months and their mothers (MAMI) Global Network⁴ – an established global community of practitioners working together for more than 10 years – is already trying to figure out how to find and best target risk-mitigation care for small and nutritionally at risk (in other words, vulnerable) infants under six months and their mothers.

To fill a critical gap in 'how', we collectively developed the MAMI Care Pathway Package,⁵ an adaptable framework and resources to guide integrated continuity of care across maternal and child systems of health and nutrition. It is being piloted/programmed around the world with implementation experiences and research helping build a critical evidence base. The MAMI approach involves enrolling small vulnerable infants under six months and their mothers in community-based care to six months of age to provide targeted support, keep a watchful eye, and enable prompt action. LBW is included as an independent enrolment criterion and prematurity an added marker of risk.

Through MAMI, we aim to prevent as much as 'treat'; these babies' troubled start to life may well be fuelling subsequent malnutrition episodes, relapse, and failure to respond to treatment later on. We always consider the mother–infant pair – a vulnerable baby may often mark a vulnerable woman. Systems and services to manage small and vulnerable babies offer a critical entry point to cater for long-neglected women's health and nutrition (Lelijveld, 2022).

¹ <https://www.ennonline.net/mediahub/blog/mami-reflections-on-the-lancet-small-and-vulnerable-newborn-series>

² <https://www.ennonline.net/fex/69/calls-to-action-global-health>

³ <https://www.childwasting.org/the-gap-framework>

⁴ <https://www.ennonline.net/ourwork/research/mami>

⁵ <https://www.ennonline.net/mamicarepathway>

Lightening can strike twice: Targeting prevention

The 'Call for Action' (Mohiddin et al, 2023) challenged me to think more deeply on what we can do on the preventative side for babies under six months and their mothers who we identify for care in the MAMI approach. Starting life as a small vulnerable baby is catastrophic for an individual's life chances. To prevent it happening to more people, we could target preventative action to those already affected. On this front, multiple micronutrient supplementation (MMS) feels like a low hanging fruit. The authors of Paper 4 (Hofmeyr et al, 2023) conclude that evidence supports the provision of MMS instead of just iron and folic acid for women in low- and middle-income countries (LMICs). Broadening the World Health Organization (WHO) recommendations from the use of MMS in the context of research, to use for all women in LMICs could result in substantial reductions in small for gestational age (SGA) births, stillbirths, and neonatal deaths.

This makes me think: if a woman already has a small vulnerable baby, shouldn't she be a prime candidate for MMS supplementation? Should we be more directive on MMS in the MAMI Care Pathway? We'll be examining this in our 'Mothers in MAMI' review planned for later this year.

If we don't look, we don't see

Small vulnerable babies and their mothers are everywhere, in some places more than others. We often don't see them because we don't look for them. Through our MAMI approach we are trying to change that. In January this year, I visited a health clinic in Ethiopia where the London School of Hygiene and Tropical Medicine, ENN, Jimma University, and GOAL are conducting a randomised control trial and process evaluation of the MAMI Care Pathway Package integrated within outpatient health clinics in Jimma Zone and Deder *Woreda*.⁶ A very underweight baby and her mother were enrolled in the trial and came for follow-up support to an outpatient clinic while I was there. Identified as severely underweight through screening at first vaccination as part of the trial, it transpired this four-month-old was one of triplets, born premature at 28 weeks and the sole survivor. Without proactive screening, this mother and baby would not have been picked up unless they presented sick or malnourished.

When we look, it's still hard to see

The Lancet aims to bring much greater visibility to the nature of the SVN burden beyond what LBW offers. Prematurity and SGA are the 'driving pathways for vulnerability' that informed the development of the 'SVN' umbrella term and the accompanying conceptual framework (Lawn et al, 2023). This focus on functional outcomes resonates with the direction of travel in MAMI and in the world of nutrition: whether a child is small or tall doesn't matter – what matters is whether they survive and thrive and live long and fruitful lives (Kerac et al, 2020).

The authors set an ambitious call and target for premature and SGA data collection at health facilities worldwide. I worry that such depth of data in routine services will not be feasible anytime soon. Our experience through MAMI is that even birthweight data is not available in many contexts, making it difficult to exactly identify these babies for follow-up care. So, while we strive for the ideal, I think we need plans B, C, and D to handle the many realities, with interim pragmatic options to identify those infants most at risk of dying. For example, we have found that weight-for-age and mid-upper arm circumference, measured at six-week vaccination, pick up infants at higher risk of death (which is critical to know), which includes LBW infants (which is good to know) (Mwangome, 2019). These indicators won't give the visibility on SVNs that this series is seeking, but at least it will help us ensure that these babies and their mothers access timely, supportive care.

Working together is not easy, but so worth it

SVNs are a result of *mal*-nutrition, *mal*-health, *mal*-development, *mal*-you name it. We all need to be on the case. Collaboration isn't easy. It involves negotiation, brokerage, and willingness to compromise. Paper 2 (Lawn et al, 2023) digs into collaboration with an insightful analysis of the four main challenges that global health networks tasked with LBW reduction face in generating attention and resources. These findings resonate with our experiences at the MAMI Global Network. Here's some of what we're doing and have learned along the way.

Different definitions and fragmented guidelines are two of the challenges that have hindered clarity and action on LBW reduction. They also hinder co-action across nutrition and health. Our definitions create obscurity – one person's SVN becomes someone else's underweight six-week-old who becomes someone else's wasted seven-month-old. Yet we are all talking about the same baby. This makes it a nightmare to join up the dots across initiatives and creates headaches for advocates trying to herd us all into simple, shared messages to galvanise attention and resources (Kerac, 2020).

With this exact problem in mind, ENN is now undertaking a scoping review of global health and nutrition guidance relevant to the care of small and vulnerable babies under six months and their mothers. We are working to unravel concepts, definitions, and development processes to identify synergies, gaps, and practical opportunities to work together. Opportunities already leaping out at us include the ongoing implementation guidance development to accompany the recently released WHO updated guidelines on wasting management⁷ and recommendations for the care of premature and LBW infants (WHO, 2022). It's madness if we don't make that happen. For the review, we are collaborating across agencies including UNICEF and WHO, as well as with partners in the Healthy Newborn Network,⁸ and across disciplines, and welcome any offers to join in, help shape our work, or to invite us to contribute to your efforts.

When we developed our MAMI Global Network five-year strategy, we scrutinised the strategies, visions, and objectives of health and nutrition initiatives.⁹ We called out common ground to help connect. But making this happen takes a lot more work. We've found that it really helps to have something practical to convene around, rather than some well-meaning but vague intent to 'work together'. We've had positive experience of this with the Inter-Agency Working Group on Reproductive Health in Crises,¹⁰ contributing a MAMI take on 'Success Depends on Collaboration: Cross-Sector Technical Brief on Maternal and Newborn Health and Nutrition in Humanitarian Settings'.

Throwing collaboration into the already busy mix may well slow things down and bring complexity. But from 25 years of experience of this at ENN, I can say it is worth it. A great example is the update of the MAMI Care Pathway Package. We originally planned to update it in six months. It took 16 months. Why? We engaged nutritionists, neonatologists, and specialists across nutrition, early childhood development, maternal mental health, and child health in the process. Committed individuals found the time to review, suggest, and appraise content to generate a completely revamped version. What resulted was so much stronger, not only in terms of relevance and content but also shared ownership and buy-in. This was only possible because of the strong relationships with individuals we had nurtured through our networking over the years, and through flexible, intelligent funding from Irish Aid and the Eleanor Crook Foundation who saw the value of collaboration, trusted us, and invested in a process whose value is way beyond what can be measured in monetary terms. I'm happy to say, the Bill and Melinda Gates Foundation is now supporting our network in a similar vein.

We know what to do but do we know how to do it?

The series clearly identifies what to do and why to prevent SVNs. But, at the Cape Town launch,¹¹ I did sense an air of disappointment that there was nothing new in the package of interventions proposed for scale. I'm worried this will prompt a hunt for that elusive magic bullet missing from our repertoire. Instead, we need to turn our attention to the 'how'. We need to take that particular bull by the horns, embrace the complexity of real life, and invest in implementation capacity and research (Greenhalgh & Papoutsis, 2018). Why do interventions work or not, how, for whom, in which contexts? How do we lessen the load of overburdened health systems? Otherwise, we will be still scratching our heads in 2030 when we have failed to come even close to SDG targets.

Recognising this longstanding evidence gap, *BMJ Global Health* is now encouraging sub-

⁶ <https://www.enonline.net/ourwork/research/mamiriseethiopia>

⁷ <https://app.magicapp.org/#/guideline/noPQKE>

⁸ <https://www.healthynewbornnetwork.org>

⁹ Including the Every Newborn Action Plan: <https://www.who.int/initiatives/every-newborn-action-plan>

¹⁰ <https://iawg.net/about/sub-working-groups/maternal-newborn-health>

¹¹ <https://vimeo.com/825728733>

mission of implementation science articles as a sign of their commitment to the 2016 Ottawa Statement to achieve “more and better implementation research”. Perhaps *The Lancet* would consider joining this movement to help bring rigour and attention and catalyse investment in research? This would be a great dimension to feature in the future *Lancet* series planned on the management of SVN. Given our efforts on this front, we would love to contribute by tapping into the rich body of implementation evidence on the ‘how’ that is accumulating through the MAMI Global Network.

We hear your rallying cry loud and clear!

The smallest babies have the quietest voice. *The Lancet* SVN series has raised the volume, generated clamour, and is making noise on their behalf. We hear you, we’re acting, and we are keen to join forces in whatever shape or form collaborators may come in.

Forewarned is pre-armed; we will come knocking on various doors. Please let us in! The favour is returned; our door is always open. Come in and pull up a chair.

For more information, please contact Marie McGrath at marie@enonline.net

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No child faces: Examining the use of child images from nutrition assessments



Alexandra Humphreys is a Humanitarian Nutritionist with eight years of nutrition assessment experience in fragile contexts.



Grace Heymsfield is a Registered Dietitian Nutritionist with eight years of nutrition assessment and research experience.

Positionality statement:¹ The authors acknowledge that we are white females in our 30s, born and raised in middle-class families in the United States. We are able-bodied, neurotypical, and hold Master’s degrees. These factors provide elements of privilege, bias, and blind spots that limit us when speaking about people with lived experiences different to our own.

We are publishing this article independently, without affiliation, and any views expressed do not necessarily reflect the views of affiliate organisations. We thank Martha Nakakande and Sarah King for their insightful feedback, suggestions, and review.

What we know:

The use of images of children, whether distressed or smiling, is standard practice in the humanitarian sector. In the worst cases, such photos are used by nonprofits and charity organisations to gain sympathy and contributions from donors by showing exploitative imagery of people living in destitute conditions.

What this adds:

This article is a critical examination of child images used in nutrition assessments based on the experience of the authors. We ask the reader, and ourselves, to think of images of minors as a form of sensitive data and question the conditions under which these images are extracted.

Naming the problem

The use of child images, particularly in the humanitarian sector, is problematic. In the worst cases, child images are used by nonprofits and charity organisations to gain sympathy and donations by showing exploitative imagery of people living in destitute conditions – referred to as ‘poverty porn’.² More ubiquitously, pictures of identifiable minors in humanitarian contexts continue to be relied on for internal communications, fundraising campaigns, technical guidelines, articles, case studies, grey literature, and donor reports. This is despite existing guidelines and the sector espousing a central ‘Do no harm’ principle.

Unhealthy power dynamics, often in the form of ‘saviourism’ (Box 1), are at the root of colonialism and current global health practice. The ‘White Man’s Burden’, a term used mainly in the 19th century, expressed the idea that European countries had a duty to control countries and entities in parts of the world with less money, education, or technology (Kipling, 1899).

Perpetuating inaccurate narratives

Depictions of saviourism are perpetuated through imagery today. Pictures that emerge from humanitarian projects too often centre on the work of foreign actors and fail to portray communities outside of their recipient or ‘beneficiary’ status. In 2005, Dorrie Chetty, Senior Lecturer at Westminster University, wrote specifically about the lack of varied representation in Field Exchange and how images in humanitarian publications support neo-colonial and ‘otherness’ narratives (Chetty, 2005).

The images we share are therefore detached from the contextual and cultural facets that

¹ Positionality refers to the personal values, views, and location in time and space that influence how one engages with and understands the world and is influenced by power and power dynamics. This definition is adapted from *The Encyclopedia of Geography* and included in a set of resources from the Anti-Racist Teaching & Learning Collective. See <https://antiracistteaching.org/>

² <https://edition.cnn.com/2016/12/08/health/poverty-porn-danger-feat/index.html>

Box 1 What is 'White Saviourism'?

'White Saviourism' describes a situation in which a white character or person is portrayed as rescuing a racially minoritised or Indigenous person from destitution without any mention of the role played by the white racial group in creating and sustaining the oppressive environment responsible for that destitution (Koum et al, 2022). Writer and historian Teju Cole coined the term 'White Saviour Industrial Complex' to describe the pattern of white people seeking personal catharsis by attempting to liberate, rescue, or save people of colour (Cole, 2012).

"The 'White Saviour Industrial Complex' is not about justice: it is about having a big emotional experience that validates privilege"

would support an authentic depiction, rendering members of the local community as props and risking the perpetuation of harmful narratives (Aubel & Chibanda, 2022).

Author Binyavanga Wainaina (2005) challenged us to confront harmful narratives, such as the notion that Africa is a homogenous 'country' of tall, thin people who are starving – in his satirical article 'How to Write about Africa'. Further, research has demonstrated that viewers of negative portrayals of those in poverty were more likely to rate people in poverty lower on measures of agency (Clough et al, 2023).

The portrayal of Ukrainians by global media outlets – as being 'civilised' or 'just like us' rather than destitute – has coincided with the diverting of attention, resources, and expertise from other emergencies to the Ukraine aid response (Shah, 2023). Meanwhile images of sick and malnourished children continue to be central to fundraising campaigns for underfunded responses in the Horn of Africa, Central Asia, and elsewhere.

Risk to the individual

Policies and practices around consent for taking images during household data collection vary widely between organisations and the individuals within them. Consent may be verbal, if the photographer and subject speak the same language – but often they do not. Consent may be written, if a form is available in the language of the subject – but often it is not. Consent may be implied, through the assumption that the subject 'won't mind'.

Subjects rarely see the photos that are taken of them, rarely know how and where the images

will be used, and are unlikely to be able to inform how their image is described, contextualised, or disseminated, especially as the rise of social media has allowed images to be shared more swiftly and with a broader audience (Duroch and L'Homme, 2022). Further, given the inherent power dynamics between humanitarian actors and the recipients of aid, it is difficult to ascertain if consent is freely given or underpinned by a fear of services or resources being denied.

Protection policies are sometimes in place for de-identifying datasets (removing names and other sensitive information so it cannot be leaked from internal databases). Meanwhile, imagery from these same humanitarian contexts often clearly show the identifiable faces of children – the community members considered to be the most vulnerable. Even where names of children are recorded for ease of distinguishing family members within the household during data collection, nutrition datasets are routinely anonymised in compliance with data protection policies after collection has taken place. We have yet to see these policies in place for children's faces. Institutional Review Board approval of assessment protocols, including child protection modules, is not standard practice.

Further, as Chetty (2005) reminds us, a consideration that is often neglected in a discussion of visual representations is the wider impact they may have upon the subjects used in the photographs, who could theoretically see themselves or their children in print or online or be identified by members of their family or community. As malnutrition is a demonstrated stigmatised condition in many contexts, it is essential that personal risk to the individual drives protection policies (Bliss et al, 2016).

Because of our positionalities, we have not had to wonder if images of us as children were publicly available as part of humanitarian campaigns.

Our complicity as survey managers

As survey managers we have personally contributed to this dynamic by taking many photos of identifiable young children, rarely with more than verbal consent from a guardian. Once taken, these photos were stored on personal devices and their uses ranged from more formal reports or agency newsletters to personal communications and sharing on social media. We have taken countless photos, selecting the most compelling or endearing to share with friends and family as a depiction of our work and choosing the most technically accurate with perfectly positioned logos for the covers of survey reports and presentations. In both cases we repeatedly sought and received positive feedback for our visual depictions of 'the field'.

In the process of writing this article, we each re-evaluated our child image footprint across our personal social media accounts. We both noted a stark discrepancy between the number of pictures we posted of children from fragile contexts and those we had posted of the children of our friends and peers. This suggests that we felt a unique right to share images of children experiencing poverty and malnutrition.

A better way forward

To (attempt to) counteract harmful narratives, the Pledge for Change³ is an initiative developed and driven by 'Global South' actors that re-imagines the role of international actors in the global humanitarian and development aid system. The aim is to build a stronger aid ecosystem based on the principles of solidarity, humility, self-determination, and equality by focusing on three core changes. One of these is centred around authentic storytelling:

"Some of the stories we tell and the pictures that illustrate them have reinforced harmful stereotypes. This kind of storytelling, sometimes associated with the 'white gaze',⁴ distorts reality, and should be eradicated from our internal and external communications."

Considering our experiences and with a desire to contribute to authentic storytelling and reducing risk, we propose three strategies for generating more appropriate yet meaningful photos during data collection in humanitarian settings.

Strategy 1: Shift the emphasis to the work of survey teams

Surveys in humanitarian contexts are complex feats of operational gymnastics, technical savvy, and community engagement. There's no limit to the photo opportunities of staff doing difficult jobs well that do not require the presence of a

Figure 1 Examples of using survey teams rather than images of children to illustrate reports



Survey teams preparing to travel to remote areas for data collection in Angola, 2021

Survey teams crossing a river to access a remote area for data collection in Liberia, 2020

³ <https://pledgeforchange2030.org/>

⁴ The 'white gaze' is a term popularised by writer Toni Morrison, on the assumption that the default reader or observer of a piece of media is white, affecting the way that people of colour are depicted. https://www.youtube.com/watch?v=oP_-m7V58_I

Figure 2 Examples of ways to anonymise pictures of anthropometric measurements

child or other community member. We can shift to images focusing on our local teams and their impressive efforts to collect data. As an example, the two pictures shown in Figure 1 portray survey teams at work.

Strategy 2: Use technical photos in which children are not identifiable

Collecting anthropometric measurements is a key activity when conducting population-representative nutrition assessments. Photographs of this process can be taken in a manner that does not risk the anonymity of the children being photographed (Figure 2). Images of measuring mid-upper arm circumference only require a photo of a child's arm or torso, while testing for bilateral oedema can be accomplished with a photo of a child's feet. The measurement of weight or height can be photographed over the child's shoulder or from another angle that obscures the face.

Strategy 3: Storytelling through contextual photos

Survey reports are often read by audiences who have never visited the surveyed area. Photos depicting the context can portray details such as terrain, vegetation, livestock, food staples, styles of housing, and infrastructure. Such contextual photos can make reports more vivid to the reader without risking the anonymity of children in the community, as shown in Figure 3.

Conclusion

In this article we have looked critically at our complicity in the use of images of minors in our work and provided some suggestions for a better

way forward for surveys in humanitarian settings. According to the 'Do no harm' principle, humanitarian actors must mitigate any negative impact of their actions on affected populations. Although a widely held principle, in reality we as white people often cause harm. Our goal should be to mitigate harm and be held accountable for that which we cause. As, ultimately, the results of surveys and their impact rely on findings in the form of data (not imagery), we have a clear opportunity to shift the expectation away from identifiable photos of children and towards other meaningful and more ethical imagery.

We presented three alternative strategies for generating imagery during household data collection in humanitarian settings through the use of photos that focus on the work of survey teams, using photos that are technical in nature without showing the faces of children, as well as contextual imagery. Other opportunities to tell authentic stories while protecting anonymity may include technical or artistic drawings and blurred, pixelated, or stylised photos.⁶ The opportunities for changing how we portray humanitarian contexts may only be as limited as our lack of willingness to challenge unhealthy power dynamics and tap into our creativity.

We invite you to join us in examining the power of imagery and how best to use it in your work regardless of your role or sector.

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A note from the editorial team

Field Exchange supports the view of the authors in that the use of child images is a contentious issue within the humanitarian sector and we can all do better in this regard. Images of children and affected populations are sometimes used, not driven by the desire to get funding or a 'saviourism' perspective by the desire to try and humanise stories and reflect that there is a human and personal tragedy at the core of every emergency. We recognise however that, as a publication that seeks to highlight learning from emergencies and high burden contexts, we use images that may perpetuate a neo-colonialist attitude – with all its associated power imbalances. This issue has been well recognised. Images that have featured in the past may not be suitable under contemporary standards. Going forward we are constantly working to improve our practice with every issue.

It should be acknowledged that some progress has been made regarding the use of imagery in humanitarian contexts. As one example, BOND⁷ developed guidelines for the collection and use of content that built off previous guides in 2007 and 2014, and a subsequent review in 2018. This highlights that the topic is now being engaged with, although questions remain regarding the implementation of such guidance.

We thank the authors for submitting these important views, allowing us to look critically at the work that we do and the role that we can play in driving positive change in the sector and beyond.

⁵ This photo was originally circulated with the child's full face but could be easily cropped so the child's face is no longer identifiable.

⁶ <https://imix.org.uk/tips-taking-anonymous-photos/>

⁷ <https://www.bond.org.uk/wp-content/uploads/2022/03/bond-ethical-guidelines-for-collection-and-use-of-content.pdf>

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Figure 3 Examples of pictures focusing on the context of the survey area

Coordination of a nutrition response in a conflict situation

Learnings from northern Ethiopia

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The Afar region is facing multiple humanitarian emergencies. Mass displacement due to drought and conflict has resulted in devastating food insecurity. Ethiopia.

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What we know:

The nutrition response in the northern Ethiopia conflict – Afar, Amhara, and Tigray regions – was especially complex. It involved facing challenges that required nutrition partners to depend on each other's technical and core capacities and to work collaboratively to reach those most in need.

What this adds:

This article explores these challenges and highlights lessons learned in the design, coordination, and scale-up of the nutrition response as the situation evolved. Localisation of the response was instrumental in increasing the coverage of nutrition services.

Background

When the conflict started in Tigray in November 2020 (Figure 1) and then spread to the neighbouring regions of Afar and Amhara, it caused mass displacement, loss of livelihoods, compromised access to food, and disruption to health, water, and sanitation facilities. These problems were compounded by drought and flooding that occurred in some areas, all of which resulted in disruption of basic services and, ultimately, loss of life. Prior to the conflict breaking out in northern Ethiopia, the prevalences of global acute malnutrition (GAM)¹ in Afar, Amhara, and Tigray regions were already above the national average (7.0%) at 13.9%, 7.6%, and 9.1% respectively (Ethiopian Public Health Institute and ICF, 2021). The nutrition response implementation was led by the Disaster Risk Management Commission (EDRMC) in government, with ENCU at the federal level coordinating the nutrition response using a hybrid coordination approach – led by both UNICEF and the government. The focus of the overall nutrition intervention was on reducing

wasting and stunting levels, as well as strengthening systems for the delivery of nutrition services. There were few humanitarian partners at the time.

In June 2021, when Tigray became the epicentre of the conflict and the number of humanitarian partners increased, the humanitarian coordination team activated a subnational cluster coordination mechanism in Tigray.

As the emergency became protracted, humanitarian needs grew. Forecasts indicated that at least 1.3 million children would suffer from wasting in northern Ethiopia in 2022, growing to 1.5 million children in 2023. It was also estimated that 400,000 children would develop severe wasting, putting them at increased risk of disease and death (Office for the Coordination of Humanitarian Affairs (OCHA), 2022a).

While the conflict ended in November 2022, the social, structural, and systematic issues it has caused in the health system entail continued challenges in the delivery of nutrition services.

This article covers how the various challenges were addressed in the design, coordination, and scale-up of the nutrition response, as well as what useful lessons we can share with others who may need to set up similar emergency nutrition responses.

A challenging response Developing a comprehensive package of care

As part of the humanitarian response, the Nutrition Cluster aimed to deliver a comprehensive package of essential nutrition services to women and children affected by the emergency. These services were guided by the Ethiopia national guideline for management of wasting (Federal Ministry of Health, 2019) and coordinated by the federal ENCU. As the coordination unit of the Government of Ethiopia, the ENCU led the process of formulating the emergency response

¹ GAM provides information on the percentage of all children aged 6–59 months in a population with low weight-for-height and/or oedema.

Figure 1 Timeline of the humanitarian response

package in the three regions of Amhara, Afar, and Tigray in collaboration with United Nations agencies, donors, international non-government organisations (NGOs), and local partners.

UNICEF and its partners supported the implementation of, and supply chains for, the therapeutic feeding programme (screening and treatment of severe wasting cases), micronutrient supplementation and deworming, and the promotion of maternal, infant, and young child feeding. An emergency food ration (BP-5) – a compact, high-calorie, vitamin fortified, dry biscuit – was also provided temporarily to displaced people until the longer-term/comprehensive nutrition intervention became operational.

Considering the high prevalence of malnutrition, a blanket supplementary feeding programme would have been advised. However, the logistics and cost would have been excessive to cover the needs. The decision was made to target individuals most in need and the World Food Programme (WFP) and its partners co-ordinated targeted supplementary feeding programmes. Through its partners, WFP provided children under five with moderate wasting and pregnant and lactating women with wasting monthly rations of ready-to-use supplementary foods and fortified flours.²

The World Health Organization (WHO) provided technical support and medical supplies to manage undernourished children who were admitted to stabilisation centres whilst UNICEF provided therapeutic milk.

Rationalisation of service provision – focus on Tigray region

In Tigray, partners responded to immediate needs – including to displaced populations in camps – but there was a lack of coordination. A joint Northern Ethiopia Strategic Response Plan was developed in May 2021 with the formalisation of the cluster in Tigray (OCHA, 2021). By August 2022, led by the Nutrition Cluster, a review of the overall nutrition response was conducted. The review revealed that the nutrition service delivery package was not uniformly implemented and varied from partner to partner. The presence of partners was not aligned with the needs and the continuum of care was suboptimal. In some areas, there was duplication of efforts; in others, there were gaps. The decline in service availability and the functionality of health facilities and nutrition sites was further compounded by non-payment of health workers' salaries since the start of the conflict.

The Tigray Nutrition Cluster and ENCU at federal level requested support from the Global Nutrition Cluster to develop the joint nutrition cluster operational response plan. The plan was completed in November 2022, and it laid out the activities and tasks that Nutrition Cluster partners had to carry out to scale up comprehensive nutrition interventions and improve the nutrition outcomes (GNC, 2022a). A clear package of comprehensive nutrition actions was defined (GNC, 2022b), guided by the Ethiopian national guidelines for management of wasting

and UNICEF core corporate commitments for nutrition in emergencies, which highlighted the activities for partners (Box 1). A workshop with all partners was held to familiarise each partner with the operational plan and the core nutrition actions and strategies to use in the health systems strengthening approach before 2023.

The Nutrition Cluster consulted with the local government and with nutrition partners to rationalise the partners' presence. With the identification of a single partner that would cover a *woreda* (district), the objective was to ensure full coverage of nutrition activities in all *woredas* with partners integrating activities from other sectors in their response area. This would leverage technical and financial resources and improve efficiency and effectiveness.

The Nutrition Cluster recommended that UNICEF and WFP create partnerships with the implementing partners that had been mapped. By January 2023, most *woredas* (70 out of 79 – 89%) had the same partner for the targeted supplementary feeding and therapeutic feeding programmes.

Achievements and challenges

Strengthening multisectoral efforts

The nutrition emergency response in northern Ethiopia relied on the implementation of a multisectoral action that had three fundamental components: working in partnership with local and international NGOs, working through mobile health and nutrition teams (MHNTs), and initiating the 'find and treat campaigns'.

Partnership with local and international NGOs

The response purposefully leveraged partners' geographical convergence, especially those also responding in food security; health; water, sanitation and hygiene; and protection in the same *woreda*. UNICEF and WFP strengthened this process by engaging the same partners for such activities. Consultations were further done with other clusters and advocacy with donors for multisectoral projects and partner selection based on partners' ability to implement in more than one sector.

Box 1 Components of the comprehensive nutrition actions package in the Tigray nutrition response

1. Detection and referrals of wasting cases (i.e., children and pregnant/lactating mothers) at health facility and community level.
2. Management of moderate and severe wasting according to national guidelines and standards.
3. Promotion and protection of adolescent maternal, infant, and young feeding practices, including monitoring and reporting on the distribution of commercial milk formula.
4. Micronutrient supplementation for children, adolescent girls, and mothers.
5. Social and behavioural change communication, nutrition education, and accountability to affected population.
6. Strengthening of the nutrition information management system, including timely reporting and monitoring.
7. Sustained nutrition supply chain.
8. Capacity strengthening of the health system through continuous needs assessment and coaching of nutrition service providers.

² Fortified flours consisted of fortified Corn Soya Blend (CSB++).

Mobile health and nutrition teams

Within the rollout of improved access to primary health care, nutrition and health activities were integrated through the establishment of MHNTs. These teams provided basic curative and preventive health and nutrition services where health facilities had been destroyed or health workers were not available.

Each MHNT consisted of three trained nurses, one health officer, and a midwife. Teams provided nutrition screening, referral, and treatment for children with malnutrition. Infant and young child feeding in emergencies support and counselling and micronutrient supplementation services were also provided. Teams were deployed to internally displaced persons (IDP) sites and communities, offering nutrition services integrated with other routine health services.

At IDP sites with larger population sizes, temporary service delivery sites were established, and these were supported by an MHNT providing outreach services in that area. In the two regions of Afar and Amhara, UNICEF supported 66 MHNTs through its partnerships. In Tigray, 86 MHNTs were operational – most of them were located near large populations of IDPs.

Find and treat campaigns

Find and treat campaigns were launched in August 2021 by UNICEF with the aim of sustaining malnutrition prevention efforts and expanding treatment services to priority areas. They represent a rapid response and quick assessment mechanism to be delivered through UNICEF's partners together with the regional health bureau and health extension workers alongside communities.

All children and women in a *woreda* were targeted for screening using mid-upper arm circumference (MUAC) measurements either in their homes or at a central point. The campaign integrated provision of other services like micronutrient supplementation, health promotion,

immunisation, and distribution of water treatment tablets.

As part of the campaign in Tigray, Afar, and Amhara, UNICEF screened 2.5 million children and 500,000 pregnant and lactating women for wasting, providing treatment on the spot for the malnourished while linking them to health facilities for follow up between August 2021 and December 2022. This led to 18% (230,000 children) of the targeted annual admissions for wasting in the 2022 Humanitarian Response Plan being admitted through the campaigns. The find and treat campaigns have also been useful in estimating nutrition needs in the absence of regular nutrition surveys (Figure 2).

Partnerships

When the crisis began in Tigray, partnerships to scale up the nutrition humanitarian response were created with UNICEF engaging eight international NGOs. By 2022, the coverage of the response improved as more partners were engaged to cover the gaps in service delivery and the response scaled up from 30 *woredas* in 2021 to all 79 accessible *woredas* in 2022. Similarly, WFP engaged the same international organisations and scaled up in 2022 to cover all accessible *woredas* through 12 partners.

As the response progressed, it became apparent that local partners had the comparative advantage of moving to areas of need where international partners had limited access due to security concerns. Local partners also provided lower operational costs, which helped increase coverage, and had good knowledge of geographic areas and the context, with extensive networks on the ground. They had the confidence of regional government and communities, allowing them to navigate constraints and deliver services. UNICEF thus engaged its first two local partners in early 2022 in Tigray. By 2023, six local partners were supporting the nutrition response in 22 *woredas* (30% of the total).

Local partners spearheaded UNICEF's find and treat campaigns and supported emergency nutrition services. Their technical capacity was sometimes suboptimal, including on highly technical nutrition rehabilitation programmes. This was further compounded by an inability to source international technical capacity due to the restrictions in place. To overcome this, some international organisations sub-granted local partners in their areas of response and supported skills development. UNICEF also provided technical support throughout, deploying trained local consultants with the required technical skills and experience in nutrition as needed.

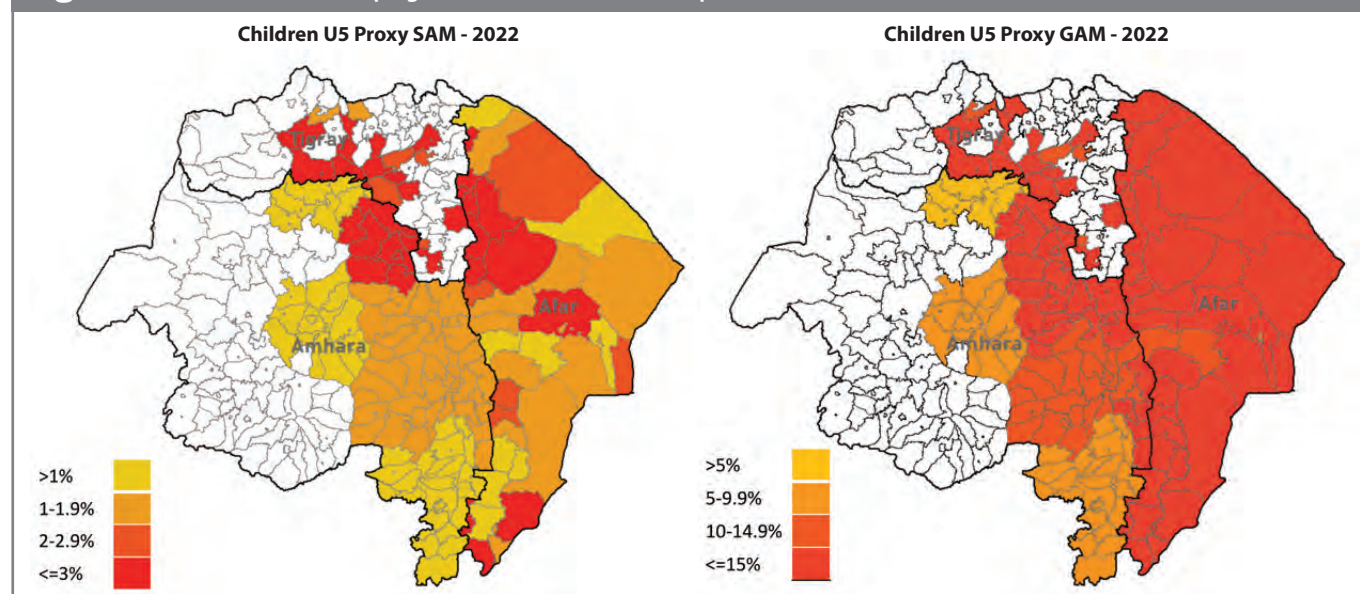
Local partners also faced operational constraints. For example, the cessation of banking services prevented access to cash, and they were not able to bring in cash through humanitarian flights arriving into Tigray, as international NGOs did. To ensure continuity of services, UNICEF initiated bringing in cash to advance to local partners.

Coordination

UNICEF, WHO and WFP, the three United Nations agencies engaged in the nutrition response, had pre-existing working relationships, and could pool expertise to manage children along the continuum of care. Due to the increasing scale of the emergency, UNICEF as cluster lead agency, took the lead for coordination efforts, working alongside the government (EDRMC, Ministry of Health and the Ethiopian Public Health Institute) and all cluster members to provide technical support and to ensure a timely, effective response. In places where the ENCU (regions and national) was functioning, the hybrid coordination was ensured with EDRMC and UNICEF.

At Federal level the Multi Agency Nutrition Task Force or Nutrition Cluster coordination meetings were also organised bi-weekly. Coordination meetings were held weekly in Afar and bi-weekly in Amhara to respond rapidly to

Figure 2 Find and treat campaign results for northern Ethiopia



the emergency. In Tigray, where the context was more complex, a dedicated nutrition cluster coordinator, a co-coordinator and an information manager supported the response.

Nutrition information systems

In Afar and Amhara, routine nutrition information was collected from health facilities using paper-based tools which were submitted monthly to *woreda* health offices. The *woreda* health office would then enter the data into the national health management information system (HMIS). However, because there were only a few nutrition indicators in the Ethiopian HMIS, a parallel ENCU data set has been used for the past 15 years to collect health facility data on severe wasting admissions and outcomes. This system was pivotal in monitoring the progress of the emergency response.

In Tigray, due to limited communication services, fuel, and health facility access, the routine nutrition data reporting system could not be used. The cluster therefore supported the use of an Excel-based tool where partners provided weekly data on wasting admissions, outcomes, and other nutrition services. This alternative reporting system also faced operational challenges; physical reports that were collected from health facilities had to reach the regional level, which was a lengthy process. This meant that regular reports were available only for the most accessible health facilities – an average of 31% of outpatient sites and 61% of stabilisation centres were reporting monthly. Despite these limitations, this data was used to continuously monitor the nutrition response.

The lack of population representative surveys during the emergency phase complicated response planning. As an alternative, MUAC screening data was included in multisectoral assessments in Tigray (e.g., in the emergency food security assessments). Find and treat campaigns and rapid nutrition assessments also served to provide a snapshot of the nutrition situation using the CDC protocol on nutrition assessment using MUAC measurement (Figure 2).

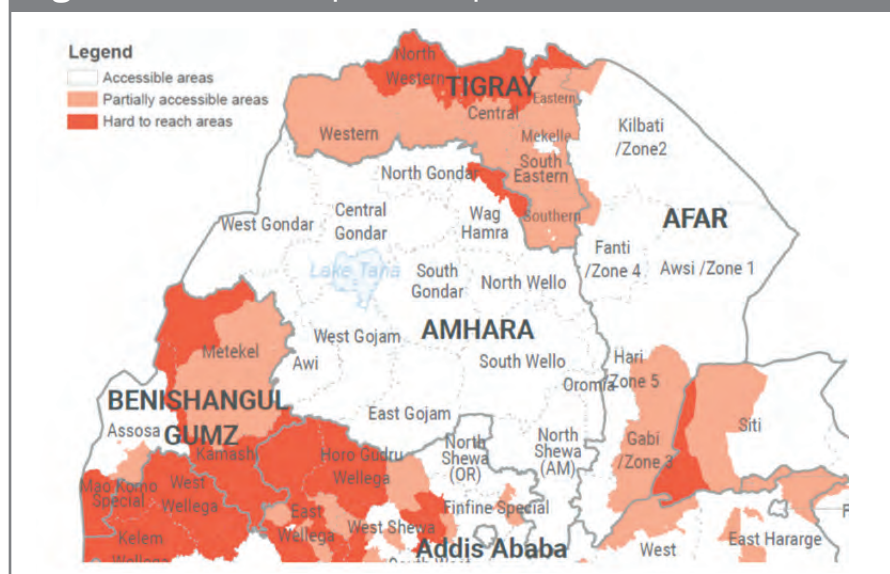
Supplies and resources

As needs increased, development funds were re-programmed to provide the initial response, including procurement of supplies and operational budgets. Availability of nutrition supplies in facilities was limited due to access issues (see below) and transportation challenges linked to a shortage of fuel. The Logistics Cluster played an essential role, airlifting required nutrition supplies when road movement was not possible and organising for the passage of supplies after the road network re-opened.

Access

Maintaining access to areas of need became difficult at various stages of the conflict, causing a sporadic supply of nutrition commodities, fuel, and cash availability (Figure 3). The humanitarian corridor often faced long waiting times for the clearance of goods and sometimes total blockage. Most international NGOs that participated in the response were unable to travel freely to affected

Figure 3 Northern Ethiopia access map



Source: OCHA, 2022b

Note: Correct as at 30 November 2022

areas due to intensified security procedures. As noted above, local partners had easier access and became increasingly involved in the response.

Lessons learned

Despite the challenges, the nutrition sector managed to scale up the treatment of children with wasting and respond to the nutrition needs of over 200,000 children with severe wasting (52% of the estimated children in need), as well as 2.5 million children with moderate wasting, in the three regions. Counselling and support were provided to improve infant and young children feeding practices and prevent malnutrition among children under five. Most children targeted (80%) received vitamin A supplementation in 2022, by means of the integration of the service into the find and treat and measles campaigns.

Through this response, coherent and meaningful partnerships between United Nations agencies and implementing partners were formed, guided by humanitarian principles, best practices, and value for money. Intersectoral efforts to reduce malnutrition – in which the food, health, and water, sanitation, and hygiene clusters also played a role in preventing malnutrition in children – highlighted the benefits of a multifaceted, coordinated response.

The localisation of the response was instrumental in reaching more people with nutrition services. As the response progressed, local partners expanded their geographic coverage and offered services in areas deemed inaccessible by other agencies. Other local solutions (e.g., the use of animal-drawn carts to make nutrition commodities available to hard-to-reach health facilities) were instrumental in providing a continuum of care in most areas.

The response was a continuous learning curve for nutrition partners in northern Ethiopia. Practical solutions were made on partnership framework agreements and operational processes to ensure that nutritional humanitarian needs were met. Flexibility in engaging partners despite

not having formal agreements with UNICEF or WFP helped ensure a timely response in an unpredictable and ever-changing context. United Nations agencies now need to work toward stronger strategic and operational partnerships with implementing partners. For instance, having programme agreements with a unique partner to cover a given geographical location appears good practice, but more evidence is needed to demonstrate that better outcomes are reached.

Conclusions

The nutrition response in northern Ethiopia achieved positive results due to the commitment of nutrition partners. The strategic processes of the Nutrition Cluster led to better accountability and improved the scale and standards of nutrition activities. Extending the engagement of local actors within the response was instrumental to its scale-up and sustainability. Going forward, the nutrition response will benefit from investment in building resilient communities and systems in case of future shocks.

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Father-to-father support groups in northern Nigeria:

An emergency response initiative



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What we know:

Male caregiver decisions directly influence female caregivers' abilities to utilise the knowledge gained through mother-to-mother support groups. Engaging with fathers alongside mothers can increase programme effectiveness.

What this adds:

After three years of implementing a community-led father-to-father support group (FTFSG) programme, a greater proportion of intervention households reported adequate infant and young child feeding (IYCF) practices than those from comparison households. Challenges included strong cultural norms, competing priorities of fathers as main providers, and limited sustainability of the approach beyond the direct programme phase.

Background

Nigeria is home to the second-highest number of stunted children in the world (15 million), and only 20% of the 2 million children who suffer from severe wasting receive treatment (UNICEF, 2023). Almost 2 million people have been displaced in Nigeria's north-eastern states, 81% of whom reside in the state of Borno.

Living conditions in the state restrict appropriate IYCF practices (NPC Nigeria and ICF, 2019). Only 44% of children were put to the breast within one hour of birth, 45% of children were exclusively breastfed at six months, and 55% of children continued breastfeeding at 12–23 months (Nutrition Cluster and UNICEF, 2022). Complementary feeding prac-

tices fare worse, with less than 20% of children aged 6–23 months achieving a minimum acceptable diet. Provision of services to prevent childhood malnutrition is also low, with 32% of children receiving vitamin A supplementation, 16% being dewormed, and only 6% receiving micronutrient powders.

Since 2017, FHI 360 has implemented four iterations of an integrated humanitarian assistance project in three local government areas of Borno state – Bama (Bama town and Banki), Ngala, and Mobbar (Damasak). This project aimed to improve the nutritional status of children under five years and of pregnant and lactating women in both internally displaced people camps and host communities. To address cultural determinants of IYCF practices, our

evidence-based social and behaviour change communication approach (Lamstein, 2019), including community support groups, was used to improve IYCF practices.

Community support groups provide spaces for conversations around breastfeeding, supporting decision making and ensuring that women have the best breastfeeding experiences possible in their communities. Mother-to-mother support groups have been running since 2017. However, a 2018 knowledge, attitudes, and practices survey (FHI 360, 2018) found that decisions made by male caregivers directly influence female caregivers' abilities to utilise the knowledge gained through these support groups. In response, the FTFSG initiative was designed by FHI 360 to involve fathers in child-care and enhance the adoption of improved IYCF practices.

Father-to-father support groups overview

Funding was secured from the United States Agency for International Development (USAID) Bureau for Humanitarian Assistance to initiate the FTFSG initiative in April 2019. A total of 484 FTFSGs have been established to date. At the end of 2022, a total of 2,412 FTFSG sessions had been held – reaching 30,917 men.

Each support group contains 8–15 men and is led by a facilitator who provides counselling, supporting group members to adopt best practices. The facilitator is a male volunteer selected

in collaboration with community leaders using set criteria. Relevant IYCF, reporting, and counselling training is provided to facilitators by FHI 360 technical staff. Within each support group, one particularly active member is selected as the 'lead father' to assist the facilitator in coordinating the group and encouraging attendance. Social and behaviour change communication strategies – including community mobilisation, social marketing, interpersonal communication, and use of education materials – are used to promote positive changes among the groups.

Face-to-face meetings are held monthly and last 30–60 minutes, depending on the interest of the group members in the particular topic. One topic is selected and discussed per month, with all 12 topics covered by the time the group graduates after one year. New members are enrolled for the following one-year period, thereby enabling more men to serve as mentors and to disseminate IYCF knowledge within their community.

UNICEF IYCF counselling cards were adopted by the Nigerian government for use at community level, providing visual tools that facilitate conversations with support groups (SPRING and USAID, 2012). Counselling topics included general hygiene, early initiation of breastfeeding, exclusive breastfeeding until six months, complementary feeding practices, and maternal nutrition – especially during pregnancy and breastfeeding.

Men are encouraged to support their wives and children within their roles as fathers, including encouraging them to carry out common household chores such as cleaning, helping to feed the child, and engaging with healthcare (e.g. taking a child to the health facility or for immunisation, accompanying their wife to health centres or antenatal services, etc.).

A community dialogue session is first conducted to ensure community engagement. After an initial introduction, community members can suggest how they want to structure the group, including deciding on the timings and venue of the meetings. Recruitment into each support group is voluntary and based on locality, with groups being open to all men who are heads of households, particularly fathers.

Monitoring data, including the number of sessions held and individuals reached, are routinely collected by the facilitator and technical staff using support group registers and summary forms.

Impact assessment

In July 2022, after three years of implementation, we conducted an evaluation to assess the impact that FTFSGs had on knowledge, attitudes, practices, and, to some extent, nutrition outcomes. Data were collected from primary caregivers of children aged under five years using a quantitative household survey and focus group discussions (FGDs). In households with more than one child under five, the survey focussed specifically on the youngest child in the household.

Table 1 Reported IYCF practices in intervention vs. comparison groups

	Intervention group	Comparison group
Exclusive breastfeeding of children aged 0–6 months	96.40%	57.10%
Early initiation of breastfeeding (newborn reported to have been breastfed within one hour of birth)	93.90%	59.20%
Timely initiation of complementary feeding at 6 months	90.30%	61.50%
Continued breastfeeding among children aged 6–24 months	93.40%	81.80%
Minimum dietary diversity	17.20%	16.40%
Mothers' decision-making power regarding food choices	92.40%	81.10%

We employed a quasi-experimental¹ impact assessment technique to compare results between an intervention group (households of FTFSG members who had completed the curriculum) and a comparison group (non-member households). There were no baseline data available to compare changes over time, nor to assess the comparability of intervention and comparison groups prior to implementation of the FTFSGs.

Settlements, and households within those settlements, were randomly selected through a multi-stage sampling technique based on probability proportional to population size. Only households in which both mothers/primary caregivers of children aged 0–59 months and their fathers were 18 years or older were considered for inclusion. Intervention households were selected from membership lists collated across all locations and comparison households from lists of non-participating households generated by community facilitators.

In total, 168 groups had completed the curriculum and graduated: 56 in Banki, 56 in Bama, and 56 in Damasak. Dikwa was excluded from the study, as no groups could be safely visited. Finally, 264 respondents were selected: 136 in households from the intervention group and 136 from the comparison group.

Results

Results from the quantitative survey showed that, after three years of programme implementation, a greater proportion of respondents from intervention households reported adequate IYCF practices than those from comparison households (Table 1). Adequate breastfeeding behaviours were reported by more than nine out of ten caregivers of children under five years of age in the intervention group, compared to between five and eight in the comparison group, which is already a higher prevalence than local and national levels (see the Challenges section). Minimum dietary diversity was overall low, with limited difference between the intervention and comparison groups. This reflects the similar constraints faced by both groups in terms of access to diverse nutritious foods and financial resources, which cannot be addressed by behaviour change interventions alone.

Most mothers participating in the FGDs reported that their husband's participation in the FTFSG had improved IYCF practices in their households.

“Since our husbands joined FTFSGs, we have learnt many things through them such as environmental hygiene, antenatal care visit, hospital delivery, using locally available foods to prepare different varieties of foods, taking a sick child to the hospital, caring for the sick child, the importance of early initiation, exclusive breastfeeding, and complementary feeding”

– Mother, FGD participant

Most women in both intervention and comparison households reported having decision-making power over food choices for family feeding. This is generally considered a women's domain, with men viewing themselves as providers and women as responsible for feeding the family. During FGD sessions, men from the intervention group reported contributing to providing safe drinking water and supporting household hygiene practices through clearing grass around the house, ensuring a clean environment, and regular handwashing after using the toilet and before eating.

“Joining FTFSG meetings has opened our eyes as we learnt many things and can let go of some norms and beliefs that contribute greatly to malnutrition. Now our children are doing well through effective IYCF practices, such as early initiation, exclusive breastfeeding, and combining different food groups to make a nutritious meal as we were taught”

– FTFSG participant

More caregivers in intervention households reported that they had heard of child spacing (79%) and that their husbands were in support of this (80%) than those in comparison households (57% and 57% respectively). Around 99% of respondents from intervention households reported referring the youngest child to the health facility the last time they were sick, compared to 88% of respondents from comparison households.

¹ In a quasi-experimental design, the randomisation is done after the intervention has taken place (*a posteriori*), rather than *a priori*, according to groups of people (communities in this case) rather than individuals.



“As soon as we observe the children are unwell, we quickly refer to the hospital. No longer visiting the traditional healer or religious home and (we need) no money to go to the chemist”

– FTFSG participant

Successes

Programme design: Careful design of the programme to respond to the needs of mothers in the community, including the social and behaviour change communication strategy monitoring system, contributed to its success and allowed adjustments to be made to programme delivery modalities. Support group facilitators comprised young, middle-aged, and older fathers with a good understanding of the sociocultural barriers experienced by other group members.

Utilising an older support group facilitator, who commanded great respect and held influence with community leaders, allowed for effective key message delivery. Sustained capacity building of the FTFSG facilitators also ensured that they could manage support group meetings and adapt messages to the local context.

Community participation: The programme was poorly perceived and not well accepted by communities at the start. However, continuous community engagement, sensitisation, and advocacy increased community acceptance and ownership over time. Awareness of local languages, norms, and health-seeking behaviours enabled positive contact with the community to support context-specific programme design and implementation.

Regular efforts were made to build good working relationships with community leaders to familiarise them with the FTFSG approach and gain their support. Fathers who were community leaders played dual roles through participation in FTFSGs and community dialogues, making it easier to encourage adoption of appropriate behaviours.

Programme monitoring: Implementation of a monitoring system allowed for ongoing identi-

fication of strengths and weaknesses in the FTFSG programme to support quality improvement. As well as tracking attendance, the system used standard IYCF tools to assess participant knowledge and behaviour change, and to evaluate the effectiveness of the support group facilitators. Regular feedback was provided to the facilitators and other stakeholders to identify areas for improvement and promote continuous learning.

Challenges

Evaluation of impact: This assessment evaluates the impact of FTFSGs based on reported IYCF practices. Intervention groups may be more likely to report what they know they should be doing based on information provided during group meetings than comparison groups who have not participated. It is also possible that exposure to other interventions, such as mother-to-mother support groups, of which 46% and 21% of respondents from intervention and comparison households respectively were members, influenced the responses provided.

Strong gender and cultural norms: Gender norms dictate that fathers are responsible for providing for the household and this affected support group attendance in cases where sustaining livelihoods was prioritised. Similarly, while positive impacts have been documented for FTFSG members, some cultural norms do not support men's involvement in household chores or in daily caregiving, limiting their adoption of key messages. Advocacy targeted at community leaders, along with sustained social and behaviour change communication strategies, were incorporated to address this.

Difficulties with programme implementation: A lack of comfortable locations for FTFSG meetings in the community made selecting appropriate venues a challenge. Some members had to host meetings in their own houses. Meeting schedules sometimes coincided with days designated for other activities – such as farming, markets, and food distribution. Liaising with group members flexibly was therefore required to ensure that feasible days were agreed upon.

The emergence of the 2020 COVID-19 pandemic also affected programme implementation and regular meetings were suspended for two months. Once reinstated, activities were adapted to include COVID-19 prevention and mitigation measures with guidance from the nutrition sector.

Sustainability: Ensuring the sustainability of the FTFSG programme has been challenging. Maintaining sufficient resources and the involvement of trained facilitators may not be feasible over the longer term. Few meetings have been recorded after participants graduated from the programme, indicating a lack of sustained mentorship and key message dissemination that may limit future impact and scalability.

Insecurity: Security threats and population displacement disrupted some activities.

Conclusion

Findings from this evaluation indicate that fathers' involvement in support group meetings has improved the uptake of recommended IYCF practices at household level, suggesting potential to contribute to reducing childhood malnutrition in vulnerable groups, such as those displaced by humanitarian crises. Other sectors could explore the use of FTFSGs to support adoption of other behaviours where gender and cultural norms influence acceptance within households.

FHI 360 plans to continue the approach in new projects being implemented, and to share these experiences and lessons learnt with other members of the Nutrition Cluster. However, expansion and sustainability of FTFSGs is critical to achieving optimal IYCF practices and more work is needed to understand how this may be achieved.

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A child being weighed at a clinic in Nairobi, Kenya.

Field Article

The effect of age rounding on weight-for-age z-scores: Evidence from Sub-Saharan Africa

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What we know:

As children grow, even small variations in age estimation can dramatically affect their anthropometric indices. It is therefore important to collect accurate age measurements in humanitarian and development settings for effective triage and treatment.

What this adds:

This article explores how the imprecise reporting of age data presents significant barriers to the classification of malnutrition status by weight-for-age z-scores. In Mali, Chad, and Kenya, age rounding by caregivers may have biased underweight estimates, resulting in under-/over-diagnosis and extended or reduced treatment.

Background

Children aged 6–59 months are classified as malnourished when their weight-for-age z-score (WAZ) is lower than minus two standard deviations (< -2 SD) below the median on the 2006 World Health Organization growth standards (WHO, 2006).

Some researchers have proposed using severe underweight (WAZ < -3 SD) as an entry criterion for therapeutic feeding programmes in this age group, due to an increased mortality risk among these patients (Bailey et al, 2021; Khara et al, 2023). However, in populations with a high prevalence of underweight, it is often difficult to ascertain precise birth dates due to a lack of official documentation, low-literacy rates, and inaccuracies in recall data (Oshaug et al, 1994).

In many contexts, there may be a tendency to round ages to the nearest whole year, and sometimes half year (SMART, 2017). Such imprecision in age reporting could result in a miscalculation of WAZ – which is sensitive to the significant growth changes that occur in children under five years – increasing the risk of under- or over-diagnosis of severe underweight. This could then result in the provision of treatment to patients at lower risk of mortality (reducing cost-efficiency), while failing to provide treatment to patients with a higher risk of mortality (reducing treatment effectiveness).

In this article, we estimate the magnitude and frequency of age misreporting by analysing the distribution of reported ages in a large operational cohort study (n= 68,444) from Mali, Chad, and Kenya.

We assess the possible implications for under- or over-prescribing of ready-to-use therapeutic food if WAZ became an entry criterion in wasting treatment programmes. We further estimate the total misclassification that would result if age were routinely over- or under-recorded and the differential effects for children of different age groups.

Programme description

Our data were collected through three operational pilot programmes that treated children with wasting using a simplified combined com-

munity-based management of acute malnutrition protocol based on the ComPAS trials.¹ All patients in these programmes had ages based on caregiver recall.

The programmes were implemented by the IRC's Airbel Impact Lab, in partnership with each country's Ministry of Health. While the dosage and length of stay varied for each country, there were only two variations in admission criteria: either children were admitted if their Mid-Upper Arm Circumference (MUAC) was < 125 mm, or if their weight for height z-score was < -2 SD.

Although programme staff were instructed to collect children's age in all programmes, anthropometric data were often missing due to COVID-19 safety protocols and MUAC-based programmes no longer requiring weight or height measurements. In every programme, socio-demographic data were collected upon admission and required anthropometric data were collected at every visit.

Methods

Estimating the scale of age rounding

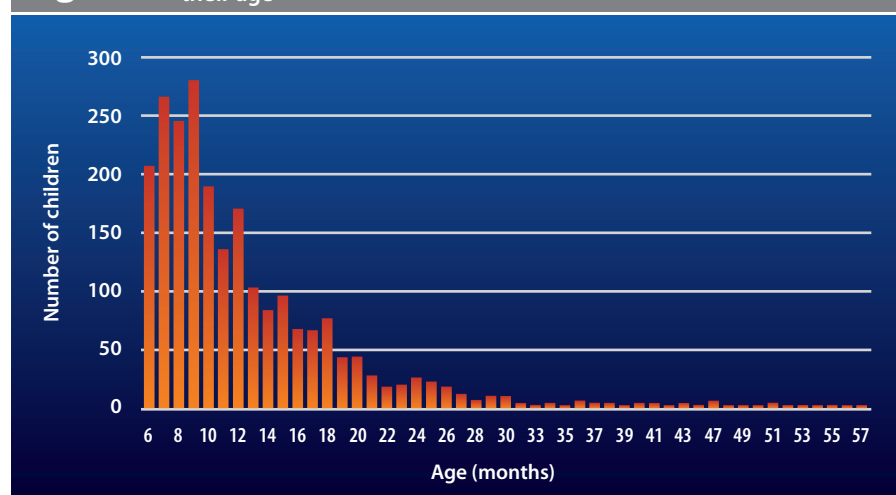
To determine if significant age rounding occurred, we plotted the distribution of patient ages across all four programmes. We then estimated the percentage of patients that would report as a whole number year based on a uniform distribution and on a normal distribution.

To determine what a programme that used documentation looks like, we observed the distribution of ages from data in ComPAS (Bailey et al, 2021) for 2,315 patients in Kenya and South Sudan who provided birth documentation.

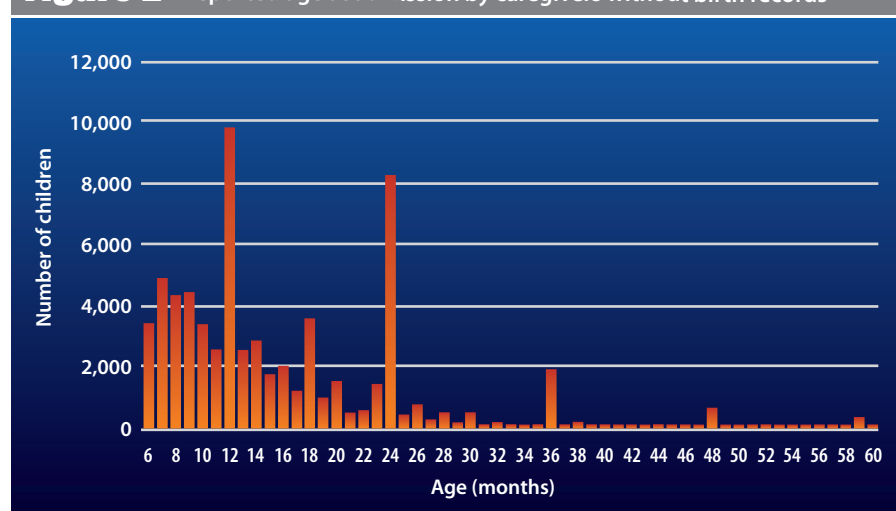
Estimating the scale of mis-categorisation induced by age rounding

We considered the difference between the observed frequency of rounded ages, and the expected frequency in normal, uniform, and observed distributions. We then conducted a sensitivity analysis – modelling the impact of different magnitudes of age rounding on WAZ

¹ <https://airbel.rescue.org/projects/compas-combined-protocol-for-acute-malnutrition-study/>

Figure 1 Age at admission for children with birth records that corroborate their age

*Data from Bailey et al. (2021), South Sudan and Kenya (N = 2,315)

Figure 2 Reported age at admission by caregivers without birth records

*Data from IRC pilot programmes in Kenya, Mali, and Chad (N = 66,712)

scores – if $WAZ < -3$ SD had been used as an entry criterion for therapeutic feeding programmes. We also show $WAZ < -2$ SD and < -1 SD to demonstrate the shifting distributions.

To estimate the effect that rounding would have, we adjusted the age of every child who was identified as being in a whole number year by a fixed value, between -6 and $+6$ months. We then calculated the percentage of children that would qualify for each level of treatment under a WAZ criterion. By pursuing this methodology for every child, we roughly estimated the chance of mis-categorisation at admission depending

on the number of months the age was rounded. We limited ourselves to ± 6 months, assuming that rounding was done to the nearest year.

Results

We included 66,712 children who had weight, height, and age measurements in this analysis. Of the 1,732 that were not included, 342 were excluded due to missing weight. This was due to the preferential use of MUAC and/or community health worker admissions during the height of the COVID-19 pandemic. The remaining exclusions ($n=1,390$) were due to data collection issues in Chad that resulted in missing age or sex.

Staff relied on caregiver recall when estimating a child's age as few clients provided documentation. Although age was requested in months, we found that caregivers were more likely to report an age on a six-month increment, with the frequency at which children were reported in these age groups suggesting that there was significant age rounding upon reporting.

To better understand the risk of misclassification and to estimate the magnitude of the problem, we assessed the frequency and magnitude of age misreporting in the large operational cohort. As a comparison to our results, we use separate data collected from the ComPAS trial in South Sudan and Kenya, where ages were collected based on birth dates verified by documentation (Figure 1). Only 8.1% of the sample was an exact year value when rounded to the nearest month (Bailey et al, 2021), resulting in a relatively smooth distribution throughout.

In a uniformly distributed population within the range 6–60 months, 9% of the sample should report age as a multiple of 12 months. In our data, there is noticeable heaping at 12, 24, 36, 48, and 60 months – over 30% of the entire sample. This suggests that approximately 22% of the full sample was affected by rounding (Figure 2) and therefore highlights the imprecision in computed anthropometric measures involving age.

Table 1 indicates that 40.8% or 58.8% of patients would be eligible for severe underweight treatment if rounded up or down, respectively.

Assuming an average rounding of ± 6 months, almost 20% of all patients who would arrive at health centres under a low-WAZ criterion could be misclassified in the four specified programme areas if we were to accept their reported age at face value. Similarly, age rounding would result in approximately 14% of patients being misclassified as having nutritional deficit risk ($WAZ < -1$). Overall, if therapeutic feeding programmes were to consider low WAZ as an admission criterion, the age rounding could easily result in treatment being refused to underweight patients, or provision of treatment to non-underweight children at a similar rate.

Lessons learned

The mis-categorisation of patients due to age rounding could represent a significant cost to programming (treating patients that should not qualify) and a significant risk to children (who would not be treated that would otherwise qualify).

Using exact birthdays (Figure 1) appears to mitigate this issue entirely – highlighting a clear opportunity. Unfortunately, this policy is

Table 1 Weight-for-age sensitivity analysis – Estimated full sample underweight prevalence, according to degree of age rounding

	Number of months rounded												
	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6
Severely underweight (< -3 SD)	40.8%	42.4%	43.9%	45.8%	47.3%	49.4%	50.9%	52.7%	54.0%	55.4%	56.8%	58.0%	58.8%
Underweight (< -2 SD)	29.8%	30.7%	31.1%	31.2%	31.3%	30.8%	30.6%	29.9%	29.2%	28.4%	27.5%	26.6%	26.1%
Nutritional deficit risk (< -1 SD)	29.4%	26.9%	25.0%	23.1%	21.3%	19.9%	18.5%	17.4%	16.8%	16.1%	15.6%	15.4%	15.1%



Children being assessed for underweight at a clinic. Mali.

programming while correction algorithms are only helpful for post-estimation.

While these changes may improve measurement of age, there may also be additional consequences to algorithmic checking and additional questioning of caretakers. Additional oversight of staff can lead to incentives to adjust admission statistics to fit the expected pattern, especially when low admission numbers can lead to surprising distributions at the health centre level. Additional questioning of caretakers without birth records could turn mothers away, make them reluctant to share additional information with health centre staff, or increase the time that caretakers need to wait for treatment.

We have shown that lack of proper documentation and birth records significantly reduces measurement accuracy and may have many additional downstream effects for any programme that uses WAZ in their admission and discharge criteria. Directly related to this research we have found that, unless a context has access to accurate birthdate records, further work is recommended before implementing a WAZ-based admission protocol or any other age-based treatment or risk assessment. Given that low WAZ is a significant predictor of mortality risk, and that age does appear to be accurately measured through documentation, the ideal solution may be to advocate for all countries and communities to implement birth certificates to eliminate the need for the proposed imperfect solutions.

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not enacted in many health centres due to a lack of documentation and reliance on recall from caregivers. In some contexts, such as the Hagadera refugee camp in Dadaab, Kenya, documentation is provided by a camp interview and is itself subject to caregiver recall.

Other methods have been used for mitigating this issue, such as the proper use of event calendars to aid caregivers in determining the approximate month of the child's birth. The SMART Methodology identifies that improper administration of events calendars can also lead to age heaping.

Spending more time questioning caregivers that provide an exact year age to increase their specificity is another approach that could be considered. There could also be opportunities to better link growth monitoring programmes and therapeutic treatment programmes in areas that offer such programmes as a way of improving age estimates.

Limitations

As our criterion were not age dependent, it is likely that staff put less emphasis on correct age identification. This same analysis would need to be repeated in a similar setting where age is an admission criterion to see enumerators more successfully identify age.

While our data is limited to four sub-Saharan African contexts, these data are compelling and we have seen similar trends in DHS data (Lyons-Amos and Stones, 2017), as well as with other measurements (Perumal et al, 2020).

Older patients' z-scores are less elastic toward single month changes in age due to a wider distribution. However, older patients also experience more heaping on years versus half-years, which suggests higher average number of months rounded per patients. That said, we also consider that younger age groups face the highest risk of mortality associated with underweight (Thurstans, 2023). The opposing direction of these effects merits additional research as older patients may be more misclassified compared to younger patients but may also experience lower risk generally.

Conclusion

We have observed that inaccurately rounding ages even by a few months could lead to biased underweight estimates, resulting in under-/over-diagnosis and extended or reduced treatment.

Our results recognise the problems associated with the inaccurate measurement of age in surveys or interventions designed in low-income settings, calling for further research and improvement in the following three arenas: (i) increased use of algorithms that estimate age heaping, such as the Emergency Nutrition Assessment software that is provided by SMART, to inform monitoring efforts of data quality; (ii) refining methods and tools to improve the accuracy of age reporting, including recording children's age to the nearest month using event calendars; and (iii) provision of more intensive training to enumerators to highlight the importance of age identification. The latter two techniques could be implemented in routine

A mother and her baby wait at the health centre for malnutrition screening, Zambia.

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Field Article

Research priorities for infant and young child feeding in emergencies



Kenya Addison is a development consultant in the Human Development Practice at Genesis Analytics.

This research article was adapted from an original student dissertation project titled "Ask any of us 'can you show me the data?' We barely have it: A qualitative study of research priorities on infant and young child feeding in emergencies", which Kenya completed as part of the MSc Nutrition for Global Health course at London School of Hygiene and Tropical Medicine.

What we know:

A 2016 research prioritisation exercise distilled 10 research priorities concerning infant and young child feeding in emergencies (IYCF-E).

What this adds:

This qualitative study explores the perceptions of IYCF-E practitioners to identify the relevance of these research priorities and whether there is a paucity of evidence or whether, instead, practitioners are simply not aware of evidence that already exists. Of the 10 research priorities, participants consistently found seven to still be relevant and their perceptions of the evidence aligned with the state of the evidence.

Background

Fragile and conflict-affected nations experience an under-five mortality rate three times higher than the global average (UNICEF, 2023). Infants and young children are particularly vulnerable due to their specialised nutritional requirements, immature immune systems, and dependency on caregivers. Despite the need to conduct high-quality research on infant and young child feeding in emergencies (IYCF-E), there remains a lack of robust, empirical evidence in this area.

Recognising this gap, Prudhon et al (2016) conducted a research prioritisation exercise in consultation with 27 technical experts to

identify the top 10 research priorities for IYCF-E (Table 1). To build upon their work, I conducted a qualitative study to explore the perceptions of those working in IYCF-E on the current research gaps and the relevance of these 'top 10' research priorities. This article summarises my findings.

Methodology

I conducted 13 remote, semi-structured interviews between 11 July and 5 August 2022. I identified participants through selective snowball sampling and reached data saturation when I gained no new information from interviewees. To identify whether there was a real lack of evidence or whether pro-

Table 1 Top 10 research priorities for infant and young child feeding in emergencies

Research priority	Rank
To what extent are cash transfers used to buy breastmilk substitutes?	1
What is the effectiveness and cost-effectiveness of different complementary feeding interventions (e.g., blended foods, ready-to-use foods, micro-nutrient powders, or fresh foods provision cash transfers and voucher assistance) in different contexts, on IYCF-E practices, nutritional status, and morbidity?	2
What is the long-term effect of IYCF-E interventions (such as baby tents after major natural disasters) on the IYCF practices of the caretakers enrolled in the interventions (e.g., feeding colostrum, exclusive breastfeeding until six months, and dietary diversity for children over six months)?	3
In contexts where pre-emergency breastfeeding rates are low and breastmilk substitute use is high, how can we effectively design IYCF-E programmes while protecting, promoting, and supporting breastfeeding? What is the most effective mechanism for supplying breastmilk substitute (either in kind, through voucher assistance, or cash transfers) and how can it be best managed?	4
How should re-lactation interventions be designed and what is their effectiveness and cost-effectiveness in terms of the re-lactation rate?	5
How can we provide effective psychosocial support to caretakers of infants and young children in different contexts (e.g., in the presence or absence of qualified staff)?	6
How can we determine the number of potential beneficiaries and the coverage of IYCF-E programmes?	7
When use of infant formula is necessary, what are the pros and cons (e.g., safety, timeliness, and cost-effectiveness of distribution of ready-to-use infant formula) compared to the distribution of powdered infant formula plus kits for the safer use of commercial milk formula?	8
How can we calculate the impact of specific IYCF-E programmes on nutrition status, morbidity, and mortality (e.g., through mathematical modelling)?	9
How can we effectively link and mainstream IYCF-E interventions with other sectors (such as health water, sanitation and hygiene food security and child protection)?	10

Adapted from Prudhon et al (2016)

Figure 1 Evidence gaps in the knowledge translation framework

Adapted from Pearson et al (2012)

professionals were just unaware of existing evidence, I compared participant knowledge about these 10 IYCF-E priorities with a subsequent literature search.

I used thematic analyses to examine interviewee responses, organising first into themes, which were then disaggregated into sub-themes. I then used Pearson and Jordan's framework (Figure 1) to guide the interpretation and presentation of the results. The framework outlines the different types of evidence needed in the process of evidence generation and translation of health-related research into implementation. Framing research priorities for IYCF-E within this framework served to organise and clarify where research should be targeted.

Results

Interviewees were of different ages and genders and came from a variety of research, policy, and programmatic backgrounds. All participants had a minimum of five years' work experience in IYCF-E to ensure a valid sample of professional knowledge in this area.

Complementary feeding interventions

Research on the effectiveness and cost-effectiveness of complementary feeding interventions was consistently identified as being one of the top two research priorities by participants. Interviewees expressed how complementary feeding interventions had been previously neglected in IYCF-E research, with research primarily focused on breastfeeding.

"Complementary feeding has been quite marginalised in the IYCF-E space. I think the focus really was on breastfeeding and formula feeding because it was so obviously urgent."

– Participant 9

How to effectively design IYCF-E programmes at the same time as protecting, promoting, and supporting breastfeeding

Research into mechanisms for the effective design of IYCF-E in settings where pre-emergency breastfeeding rates were low and commercial milk formula use was high was identified as one of the top two research priorities by 11 interviewees. Participants reflected on the fact that there is hesitancy to conduct research in this area.

"I think people have been scared of commercial milk formula and tended to shy away from it."

– Participant 9

Cash transfers and commercial milk formula

A total of 10 interviewees reported that the extent to which cash transfers could be used to purchase commercial milk formula has not been sufficiently researched. However, all 10 of these interviewees felt the priority as it then stood would not provide useful information and should instead form part of a wider research priority – such as "How could cash transfers be designed to effectively support IYCF-E?"

"How is that information going to be used? I think that needs to be more of a wider research priority"

– Participant 3

Re-lactation interventions

A total of nine interviewees felt that the design, effectiveness, and cost-effectiveness of re-lactation interventions remained a research priority. Interviewees reflected that having more evidence on re-lactation would help to build confidence in its use in emergency settings.

"There's still a lack of confidence in re-lactation and not many places where there's any sort of systematic programming. We definitely need more research to help people to be confident."

– Participant 9

Psychosocial support for caretakers

A total of four interviewees spoke directly to this and reported that the provision of effective psychosocial support remained a priority, stating that a caregiver's psychological state can influence their ability to care for their child and impact their feeding practices.

"I think, particularly how to support those mothers and caregivers, who are distressed, who feel that they need infant formula. But...really what they are needing is breastfeeding support. It is difficult. We don't really have a lot of evidence around it."

– Participant 9

Calculating the immediate impact of specific IYCF-E programmes

Although this was the least mentioned research question, all four interviewees who spoke about calculating the impact of IYCF-E programmes felt that it was still a priority as it provides vital information for advocacy efforts, particularly when approaching donors.

"It's important in terms of the evidence around the importance of our IYCF-E programmes, because we need it for advocacy – we need to continue raising the profile of IYCF-E programmes and investment"

– Participant 8

Calculating the long-term effect of IYCF-E interventions

Overall, the eight interviewees who spoke to this topic felt that the long-term impacts of IYCF-E interventions were not a research priority. Interviewees stated that it was more important to first study the short-term impact and that we were not yet at the stage of studying long-term outcomes.

"We absolutely are in desperate need of evidence that the interventions that we have in the operational guidance are effective and helpful in the long term."

– Participant 9

Coverage of IYCF-E programmes

All interviewees reported that research on how to calculate the coverage of IYCF-E programmes was not a research priority due to the increase in available tools and guidance.

Ready-to-use versus powdered infant formula

In total, 13 interviewees thought further research on ready-to-use versus powdered infant formula was not required, as learning was deemed to be available, and that ultimately the decision on which to use would be context specific and driven by what was available at the time.

Mainstreaming IYCF-E interventions

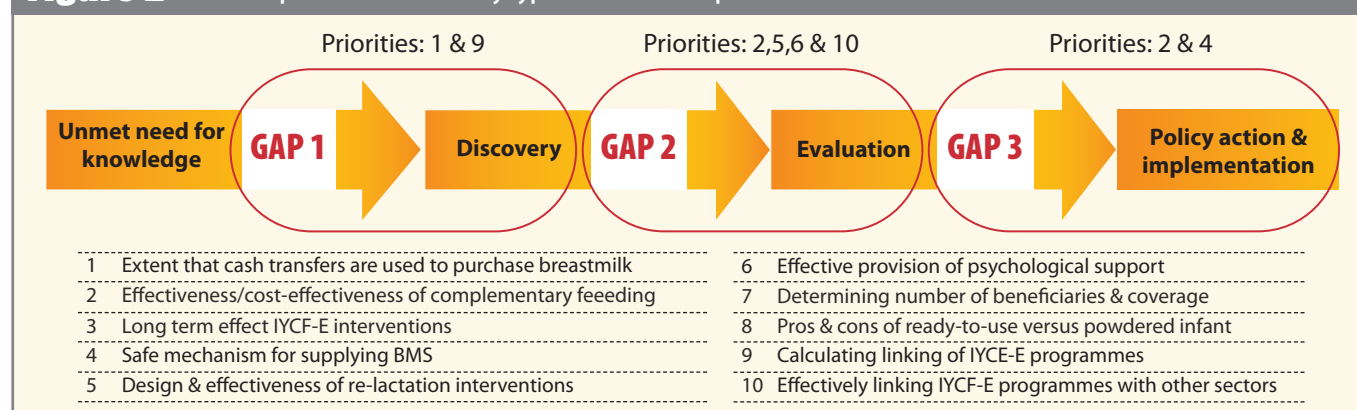
A total of 10 interviewees identified research on how to effectively mainstream IYCF-E interventions into other sectors as a research priority. Interviewees noted that there was operational guidance on this topic, but that more evidence was needed regarding its impact on IYCF-E outcomes.

"We have the UNHCR framework... I think it is a great framework to tell us what to do. I don't think we've necessarily researched it to say... is this effective?"

– Participant 6

Discussion

The effectiveness and cost-effectiveness of different complementary feeding interventions and the safe supply of commercial milk formula

Figure 2 Research priorities classified by type of evidence required

were identified as the top research priorities. Commercial milk formula has been extensively distributed in emergencies in a harmful and unsolicited manner – with practitioner focus limited to preventing distribution, rather than exploring the mechanisms required for safe supply. UNICEF recently released guidance on the supply of commercial milk formula in emergencies (UNICEF, 2021), which showed welcome progress. However, participants highlighted the growing concern that commercial milk formula may be increasingly required in emergency situations and stated that they would like to see further evidence of how this has been safely implemented in different contexts.

The research priority regarding the extent that cash transfers are used to purchase commercial milk formula remains relevant and is unanswered. Since Prudhon et al (2016), several studies evaluated cash transfers and their impact on nutritional outcomes. However, none of these refer to commercial milk formula, which may be due to hesitancy in appearing to support it. Although this research question was not viewed as one of the most pressing priorities, future evaluations of cash transfer programmes may want to consider including this as an outcome, particularly as more emergencies are occurring in contexts with low rates of pre-emergency breastfeeding and high rates of commercial milk formula use.

Research on the design and effectiveness of re-lactation interventions is required. This was identified as an unanswered research priority. While there may be growing institutional knowledge whereby some practitioners working in IYCF-E know how to support re-lactation, there is a lack of 'formal' or peer-reviewed evidence on the effectiveness of such interventions. A recent scoping review on re-lactation methods and facilitators acknowledged this limited evidence base, as its authors relied on case studies (Cazorla-Ortiz et al, 2020).

The research question on the provision of effective psychosocial support to caregivers has been partly answered (operational guidance on providing psychosocial care was published, for example, by Save the Children). However, evidence on the efficacy of providing psychosocial care to adults in emergencies, whether caregivers or

not, is limited. A meta-analysis showed that mental health and psychosocial support programmes in adults in humanitarian emergencies help to increase psychological functioning and coping skills (Bangpan et al, 2019). Nonetheless, caregivers may face additional or different burdens, meaning evidence specific to caregivers is required.

Research on effectively integrating IYCF-E interventions into other sectors remains a priority. Since these research priorities were published in 2016, Save the Children and UNHCR (2018) have released a multisectoral framework detailing the linkages between IYCF-E and other sectors. Although participants acknowledged the progress this represented, they felt that more evidence could be generated on effectiveness of applying this framework in practice. Brief case studies are noted in the roll-out guide, but these do not acknowledge the barriers associated with multisectoral work and how to overcome them – a key component of successful implementation. Detailed evaluations on the implementation of this framework across different contexts are required.

Mapping Prudhon et al's (2016) research priorities against the Pearson et al (2012) framework aids in outlining the different types of evidence that exist and are needed in IYCF-E (Figure 2). The research priorities noted as being the most critical by most participants (priorities 2 and 4) fall within the final part of the knowledge generation and implementation framework – policy action and implementation. This indicates that research in IYCF-E should be focusing on implementation (getting interventions into routine programmes and policy).

Limitations

Snowball sampling is a non-random tool that introduces sampling bias into a study. However, given the small number of active professionals available in this small field of work, this was a convenient and appropriate study design for the research question. The small sample size ($n=13$) was not inherently problematic for the interview format, but the quality of responses relied heavily on how forthcoming, experienced, and accurate each participant's answers were, such that small deviations could have a large impact on the results. This was mitigated by selecting interviewees with at least five years of experience.

Conclusion

IYCF-E remains under-researched, with current priorities being the effectiveness of different complementary feeding interventions and mechanisms for safely supplying commercial milk formula while still protecting, promoting, and supporting breastfeeding. Of the 10 research priorities, participants consistently found seven to still be relevant, and – with the exception of methods for calculating the impact of IYCF-E interventions, which has been addressed – their perceptions of the evidence aligned with the state of the evidence. However, this is likely due to little evidence being available.

The reasons for the gaps are clear: emergency settings are challenging for ethical research and are majorly underfunded. Case studies, grey literature, and other operational research provide essential sources of guidance in IYCF-E. This study indicates that research now needs to be focused on how to effectively implement the different prescribed interventions – to improve uptake in routine programming, policy, and stakeholder interest.

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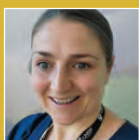
An example of inadequate food provision during the mandatory quarantine: An ultra-processed fritter with fried potatoes. Australia.

Field Article

Feeding young children during mandatory COVID-19 quarantine in Australia



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What we know:

The COVID-19 pandemic threw many countries into mandatory quarantines. In such settings, the inadequate provision of suitable foods may compromise young children's nutrient intakes.

What this adds:

Even in a high-income country such as Australia, the provision of optimal young child feeding was woefully inadequate, indicating that this is not necessarily a resource issue but rather is symptomatic of a failure to consider and plan for appropriate child feeding in such situations. The lessons presented here are applicable to any environment where parents and caregivers are unable to access food independently, such as seen in protracted or acute crises.

Background

The arrival of the COVID-19 pandemic resulted in a range of measures being implemented to restrict the spread of the virus. Health measures varied between countries and included school closures, public gathering limitations, movement restrictions (including stay-at-home orders), emergency healthcare investments, new social welfare provisions, contact tracing, travel restrictions, and quarantines. Low-, middle- and high-income countries all deployed at least some of these measures.

In March 2020, the Australian government implemented border closures and movement restrictions to control virus transmission. Australian citizens and non-citizens arriving from overseas were held in 'quarantine hotels' or other quarantine facilities for 14 days. This included families with infants or young children aged under three years. Other countries, including China and Vietnam, also had facility-based quarantine for those entering the country or required strict home-based quarantine that did

with the introduction of bitter vegetables and sweet fruits remaining key dietary behaviours to protect against chronic illness (Johnson and Hayes, 2017). To ensure that a young child's needs are met during this critical stage of feeding development, parents require access to age-appropriate foods and feeding methods. Complementary foods must also be deemed suitable by parents for them to be willing to give these foods to their children.

This article shares lessons learned from the Australian quarantine context, to assist in planning for other settings and/or for future pandemics. As a high-income country, Australia should have had the resources available to easily meet children's complementary feeding needs during quarantine. Yet it failed to do so.

Study methods

The study recruited parents who experienced COVID-19 quarantine in Australia between June and December 2021 with a child or children aged 0–3 years. Parents were recruited

The lessons presented here are applicable to any environment where parents and caregivers are unable to access food independently. This research illustrates that supporting the feeding needs of infants and young children in emergencies is not simply a matter of having sufficient resources.

not allow anyone to enter or leave the home for any reason (Hale, 2020; Thào, 2020). The public health measures, often overseen by law enforcement or the military, were crucial in reducing the spread of COVID-19, but greatly impacted the lives of families with young children.

Due to particular dietary and food security needs related to their stage of development, infants and young children are vulnerable in emergencies. However, infant and young child feeding (IYCF) in emergencies is the most neglected aspect of breastfeeding policy by governments globally (Gupta et al., 2013).

The foundations for children's eating behaviours and dietary patterns are laid down during the complementary feeding period (Johnson and Hayes, 2017). With greater taste exposure, children learn to accept greater diet variety –

via social media pages such as the Facebook group 'Parents in hotel quarantine Australia' and asked to complete an online survey. Participants had to either be residing in a COVID-19 quarantine facility at the time of survey completion or to have been in mandatory hotel/institutional quarantine in Australia in the last six months.

The online survey featured quantitative and short answer survey questions that collected data on parent and child demographics, facilities available in quarantine, child feeding and sleeping experiences, and parent experiences of caring for their child.

The study included 204 participants (96% mothers, 4% fathers), with the average age of their youngest child being 15.8 months (range 1–36 months).

Results

Unsuitable food provision

Overall, parents reported that they were not provided with nutritious meals and foods suitable for feeding children aged 6–36 months. In total, 80% (n=166) of parents stated that the foods provided for their children were unsuitable in some way. Reported unsuitability included foods not being nutritious (36%), food being of inappropriate consistency for the age of the child (20%), or foods that were potential choking hazards (e.g., nuts) (31%).

“We had to choose between baby food (i.e., terrible tasting puree) or food that was too advanced for our toddler (e.g., mini adult meals). There was no toddler option. We ended up buying in packet food... and our toddler was then difficult to feed non-processed food afterwards.”

– Caregiver for a child aged 14 months

“The food provided was ridiculous (hot dogs, party pies, chicken nuggets). We complained in the first few days but then just gave up as we realised they had no clue how to feed babies.”

– Caregiver for a child aged eight months

Due to the unsuitability of foods for their young child, 89% of all participating parents sought food deliveries from external providers (such as supermarkets). However, due to a lack of food preparation or refrigeration, the purchased food was often highly processed packaged food that was nutritionally inadequate.

Feeding routines were changed

In total, 66% of parents identified that their child's feeding routine was disrupted in quarantine. The most common problem encountered was that food being provided at set times was not amenable to the child's feeding pattern (reported by 43%). It was often noted that there was no heating or refrigeration to keep meals for when the child may want to eat.

“Food arrived once a day and with no predictability over time – between 4.30pm and 7pm. Dinner was hot and there were no facilities to reheat so had to be eaten immediately, which made it difficult to manage hunger – i.e., to know whether to give afternoon snack, prepare alternative dinners, etc.”

– Caregiver for a child aged 11 months

Child feeding behaviours changed

Over the two-week quarantine period, 42% of parents reported that their children's eating behaviour changed, 30% of parents noted that their child became more picky/fussy with their eating, and 21% reported that their child ate less frequently.

“They became more picky/fussy with their eating. They became less adventurous with different tastes/types of foods. They ate less frequently”

– Caregiver for children aged six and 16 months

Mealtimes and poor food preparation facilities

Children's mealtime routines were often negatively impacted by limited or no access to

appropriate facilities for food preparation and washing. Less than half of parents had access to a working stovetop. For almost half, the only location for washing feeding utensils was in the bathroom sink.

“We had to eat on the floor because there was no table. We had to wash food utensils in the same sink we wash our hands in after using the bathroom”

– Caregiver for a child aged 11 months

Strengths and limitations

A strength of this study is that parents who had cared for their children in quarantine completed the survey – often while still in quarantine – providing a window into their experiences during this time. The self-selected nature of participants may also be a limitation, however, as those with negative experiences may have been more willing participants. Additionally, parental reporting of the nutritional quality of provided foods may not have been accurate.

A way forward for infant and young child feeding in future quarantines

We found that children had poor access to quality age-appropriate foods when contained in a 14-day emergency quarantine isolation period during the COVID-19 public health response in Australia. Parents reported that a lack of access to age-appropriate foods and imposed feeding routines impacted their child's feeding behaviour and intake during this 14-day period. Notably, changes during this period were also reported to impact on child's mood. Data collected from parents demonstrated how quarantine facilities were underprepared for IYCF needs and had limited knowledge on what is required to support optimal IYCF in a quarantine setting.

Although the current study was conducted during the COVID-19 period in a higher-income country, the type of emergency context itself – whether sudden onset, protracted crisis, or conflict – raises similar concerns around the age-appropriate integration of nutritional support for IYCF to occur. An evaluation of funded food assistance programmes, by the European Commission, found that blanket assistance programmes often do not take sufficient account of the nutritional requirements of the target population – such as the age of a child (Haver et al., 2013).

Emergencies are critical times for infants and young children as they are more vulnerable to health risks and nutrition deficiencies due to the increased nutrition and food security requirements to meet developmental stages (Carothers and Gribble, 2014). It is also well established that parent feeding practices and interactions with their child during mealtimes can directly shape a child's lifelong dietary intake (Birch and Fisher, 1998). If children that experience sensitivity and fussy behaviour are unable to access familiar foods, they may significantly reduce their dietary intake. This causes both great parental stress and risks to their nutritional status (Lafraire et al., 2016). Parental stress during quarantine might also lead to maladaptive parental feeding practices. A recent study by

Luo et al. (2022) found that, although not in close quarantine specifically, parental feeding practices throughout the pandemic changed with a higher use of coercive control. The authors highlighted how more research is needed to further explore how to provide supportive feeding guidance to parents during emergencies.

Without question, the findings from this study established that young children's nutritional intake, feeding, and mental health were all impacted during their quarantine isolation period, with a lack of consideration given to their specific needs within the emergency quarantine setting.

Although these data were collected in a high-income country, with the restriction of movements utilised as a public health measure across all low- and high-income countries at the height of the pandemic (2020–2021) (Hale et al., 2020) and the likelihood that such movement restrictions will be used again there is an urgent need for better planning and implementation for quarantine settings. That Australia, a high-income country with capacity to properly resource quarantine environments, did so poorly in supporting IYCF exposes a lack of awareness planning and preparedness.

While no other research has been undertaken on IYCF in COVID-19 quarantine, it is likely that similar issues regarding complementary feeding were experienced in other countries, across country income categories. To support change across all countries and agencies involved in closed emergency care, the development of clear minimum standards for any closed emergency accommodation, such as a quarantine facility where families and children are confined and have food provided externally, is needed. Along with this, the development of resources on IYCF requirements is required to support the knowledge of staff in food assistance programmes and facility providers.

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Cost-efficiency of a simplified protocol for wasting treatment in Mali

Caregiver receiving RUTF sachet for her child. Nara, Mali.



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What we know:

The use of 'simplified protocols' for the treatment of wasting have been shown to be non-inferior yet less resource intensive compared to traditional treatment protocols. Logically, reduced ready-to-use therapeutic food (RUTF) dosage, among other programmatic simplifications, will result in reduced programme costs.

What this adds:

This paper assesses the cost-efficiency of different treatment protocols in Mali, comparing the traditional treatment protocol against a simplified approach. Across every spending category, treating severely wasted children with a traditional protocol cost more than under the simplified protocol.

Background

The treatment of wasting is currently divided into separate programmes based on severity. Uncomplicated severe wasting is treated through outpatient therapeutic feeding programmes, whereas moderate wasting is often treated through supplementary feeding programmes. While wasting is essentially a spectrum from mild to moderate to severe – with cutoffs acting as necessary proxy thresholds to designate treatment – these treatment programmes often run independently from each other with different sites, treatment days, and using different products with their own supply chains.

The Combined Protocol for Acute Malnutrition Study (ComPAS) demonstrated that, in Kenya and South Sudan, a combined and simplified protocol was non-inferior to conventional treatment for children admitted to treatment by mid-upper-arm circumference (MUAC) measurement or presence of oedema (Bailey et al, 2018). In the study, severely wasted children were treated with two daily sachets of RUTF and moderately wasted children were treated with one daily

sachet of RUTF – whereas in the conventional treatment, dosage was calculated as kcal/kg/day.

However, questions have remained about the effectiveness and larger cost implications of the protocol change in a routine setting. To provide further evidence, IRC conducted a combined and simplified wasting treatment pilot in rural Mali. In December 2018, IRC and the Ministry of Health (MoH) in the Nara region of Mali transitioned to a simplified protocol to treat wasting. For three years – until December 2021 – 27,800 children aged 6–59 months were treated with this protocol in 35 health facilities and 38 community health sites. The pilot sought to maximise treatment coverage by combining the treatment of severe wasting and moderate wasting, providing treatment at the community level through community health workers (CHWs), and training caregivers to detect and monitor their children's nutrition status using MUAC bands (known as the 'family MUAC' approach).

Methodology

The simplified treatment pilot conducted in Mali

complied with the ComPAS trial protocol. Children were discharged after two consecutive measures of MUAC ≥ 125 mm and the absence of oedema for two weeks. All patients were followed up weekly at treatment sites with regular MUAC, weight, and height measurements.

Treatment was provided by both government-employed health workers and incentive-provided IRC CHWs at health facilities (primary sites), as well as solely by CHWs at community health sites (secondary sites).

The cost analysis was designed as a pre-post study; data from before and after the switch to the simplified protocol were analysed. We tracked expenditure and patient data over time to determine the cost implications of the protocol switch and any potential cost-efficiency gains.

The effectiveness of the simplified protocol pilot was assessed through an observational cohort study (Kangas et al, 2022). IRC cost-efficiency was determined through IRC's standard cost methodology and use of the Dioptra software – a multi-sector costing tool managed by a consortium of non-governmental organisations. Dioptra provides quick cost-efficiency calculations for humanitarian projects using standardised humanitarian costing methodologies.

We have presented our findings first by overall cost by year, number of children treated (by different protocols), and then cost per child treated – allowing us to view the overall cost-efficiency of the simplified protocol. We then break down total yearly costs into cost categories, highlighting the main cost drivers of a given year. We then calculate how many children can be treated with 100 cartons of RUTF under the simplified vs traditional protocol, an important real-world consideration for programmers.

In addition to following the standard IRC cost-efficiency research method, supplemental data were collected to analyse the costs borne by caregivers, the MoH, and UNICEF. This was to ensure that any cost savings made by the implementing organisation were not a result of offloading costs onto others.

To evaluate MoH and caregiver costs, we performed additional surveys and interviews of MoH staff responsible for treatment. Health centre staff were surveyed to determine their wage, which was then allocated to treatment based on the number of days per week each health facility provided treatment. This was done to create a cost per facility, which could then be used to determine the cost per child at each facility.

While care and treatment were provided to patients for free, additional costs borne by caregivers fell into three categories: the opportunity cost of caregivers' time; foregone income; and any out-of-pocket expenses for transportation. To estimate caregiver costs, we conducted surveys on a random sample of 150 caregivers stratified by distance to track their typical daily activities that must be foregone to access treatment. The surveys also collected socioeconomic and demographic characteristics.

Table 1 Cost categories and definitions

Cost category	Components
IRC	
Staff costs	IRC staff remuneration, staff benefits, staff training, and salaries and stipends given to IRC-paid personnel (such as CHWs)
Travel and transportation	Transportation and lodging for IRC field visits, supervision, and training
Materials and activities	Costs of IRC-supplied material goods (such as COVID-19 adaptations, transportation of CHWs to secondary sites, stabilisation centre costs, family MUAC trainings, screening costs, or any other material goods not provided by UNICEF)
Assets and equipment	Includes technology and vehicle purchases used for the wasting programme
MoH	
Treatment personnel	Salaries and benefits of technical personnel at the treatment clinic
Caregivers	
Opportunity cost	Foregone income, foregone activities, and any expenses incurred to access treatment
UNICEF	
RUTF	All RUTF provided to patients. Standard additional medicines were also provided by UNICEF but were not costed in this study (as this would not vary by protocol)

RUTF consumption cost estimates were also generated, based on average RUTF consumption per admission type (severe or moderate wasting) and assuming a constant cost of USD 0.75 per sachet.

All the components included in the costing analysis are provided in Table 1.

Results

All data resulting from our analysis are provided in Table 2.

Implementing partner costs

Overall, a more cost-efficient programme

The IRC spent slightly over USD 2.1 million on acute malnutrition treatment in Nara between December 2017 and December 2021 (Table 2). Annual spendings were around USD 300,000 when the traditional protocol was implemented compared to around USD 600,000 per year under the simplified protocol pilot phase. However, due to the increased caseload that we could manage under the simplified protocol, the cost per child treated was lower (USD 65.6 per child) than when using the traditional protocol (USD 80.0), which corresponds to an improved cost-efficiency of 18%.

The higher costs per child treated in 2019 and 2020 were a result of additional start-up

and COVID-19 costs. These estimates reflect the IRC spendings only – they do not include government personnel time nor RUTF costs.

The cost per child treated was lowest in 2021 (Table 2 and Figure 1). This reduction was largely driven by the decreasing needs for set-up, training, and COVID-19 prevention materials (e.g., the installation of handwashing facilities, COVID-19 awareness campaigns, bulk purchasing of personal protective equipment, etc.) – which were still being incurred well into 2020. Our analysis showed that pandemic-related costs accounted for an additional 17% of the budget (data not shown) compared to costs in 2021 (USD 60.9 per child), which represented more ‘normal’ conditions despite some COVID-19 measures still being in place.

We observed additional costs in 2019 that were related to the protocol change, but most new programmatic costs were incurred in 2020 – after the health staff became more familiar with the new protocol. Start-up included activities such as family MUAC trainings and the establishment of new secondary sites.

Direct programme costs

The main cost drivers for the simplified protocol in Nara were related to staff and personnel for IRC – 27.0% national staff and 7.8%

international staff; 8.6% for travel and transport (percentages derived from Figure 1). This is typical of other IRC-implemented wasting treatment projects. IRC staff were responsible for the management and coordination of malnutrition treatment. Community health worker stipends also contributed a significant proportion in the same category of costs, given the large number of CHWs needed to provide treatment (at secondary sites), screening, and outreach services.

After staff and personnel costs, the largest amount of spending was on materials and activities (12.8%). These costs were primarily the drugs and medical supplies provided to malnourished children. A large proportion of these medical goods were used in stabilisation centres, where the most vulnerable children receive more complex medical interventions.

In total, 39.1% of total IRC spending on the project was on indirect ‘shared project costs’. These include IRC office rental costs and support staff (e.g., logistics, security, and human resource staff).

Ready-to-use therapeutic food costs

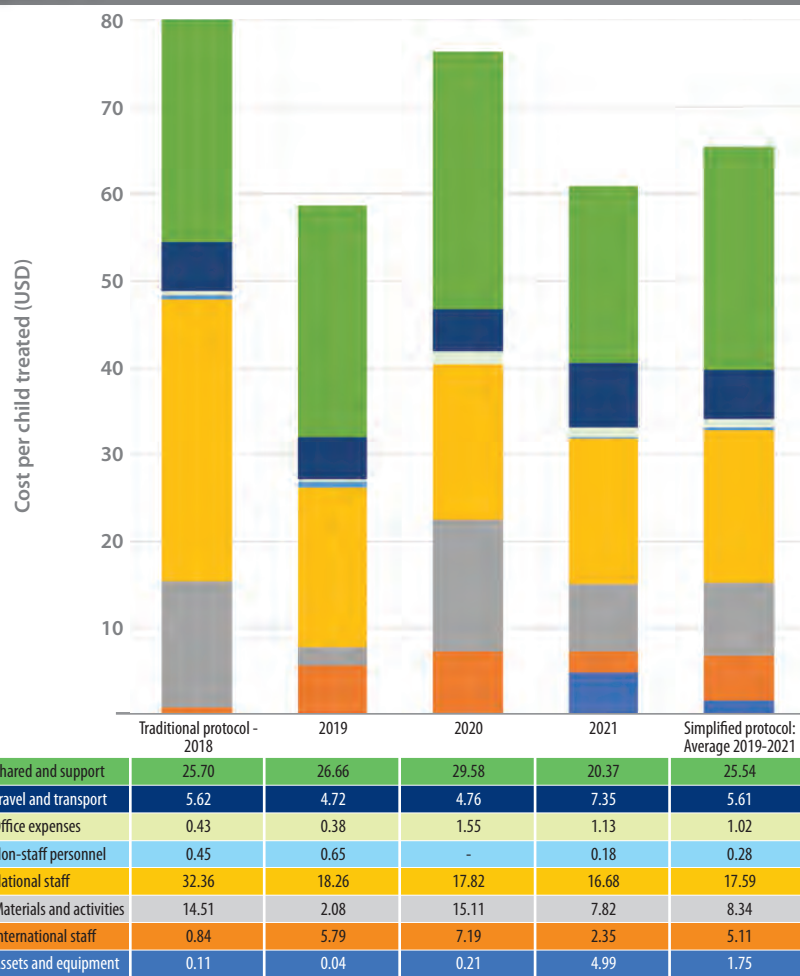
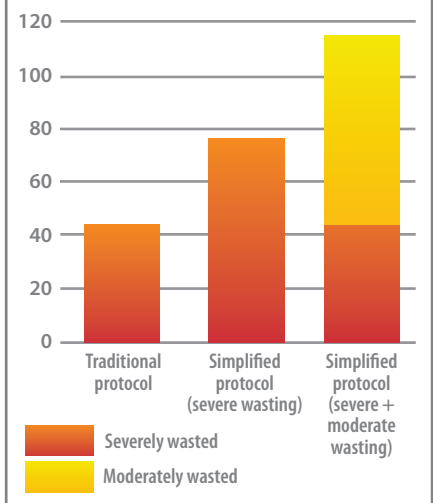
Per child treated, the RUTF costs fell from USD 223 to USD 91 once we switched to the simplified protocol (Table 2). The difference in RUTF costs can be attributed to two factors.

First, the simplified protocol adapted the overall quantity of supplies per child treated – severely wasted children were treated with two daily sachets of RUTF whereas with the traditional protocol dosage was calculated based on kcal/kg/day. The simplified protocol required 38% less RUTF per severely wasted patient treated than the traditional protocol – a reduction in the cost of RUTF from USD 223 to USD 139. For the same amount of RUTF procured, the simplified protocol can potentially treat either 77% more severely wasted children or 155% more moderately wasted children (compared to numbers of severely wasted children).

Second, the inclusion of moderately wasted children drove down average RUTF consumption per child being treated – as moderately wasted patients require less RUTF to fully recover. This

Table 2 Costs and cost-efficiency data results in Nara, Mali

Year	Traditional protocol	Simplified protocol							
	2018	2019		2020		2021		2019-2021 combined	
	Severely wasted only	Severely wasted	Moderately wasted	Severely wasted	Moderately wasted	Severely wasted	Moderately wasted	Severely wasted	Moderately wasted
Number of children treated	3,797	3,157	4,689	3,432	6,190	2,986	7,012	9,575	17,891
Total number of children treated	3,797	7,846		9,622		9,998		27,466	
Total IRC programme cost (programme + support costs)	USD 303,957	USD 460,040	n/a	USD 733,689	n/a	USD 609,039	n/a	USD 1,802,768	n/a
IRC cost per child	USD 80.0	USD 58.6	n/a	USD 76.3	n/a	USD 60.9	n/a	USD 65.6	n/a
								Severely wasted only	Severely + moderately wasted
Cost of RUTF per child treated	USD 223	n/a	n/a	n/a	n/a	n/a	n/a	USD 139.0	USD 90.7
Cost for caregiver	n/a	n/a	n/a	n/a	n/a	n/a	n/a	USD 8.0	USD 5.9
Cost to health system staff	n/a	n/a	n/a	n/a	n/a	n/a	n/a	USD 5.5	USD 3.7
Total cost per child treated	USD 360	n/a	n/a	n/a	n/a	n/a	n/a	n/a	USD 165.9

Figure 1 Cost per child treated in USD by spending category, by year – traditional v simplified protocol**Figure 2** Number of children who can be treated with 100 cartons (150 sachets) of RUTF

to the switch to the simplified protocol. In addition, IRC also added additional nutrition activities such as the establishment of secondary sites and 'family MUAC' training, which hinders our ability to make direct comparisons.

Cost-efficiency conclusions

The cost analysis results demonstrate that the simplified protocol in Nara, Mali was more cost-efficient per child than the traditional protocol previously implemented. Across every spending category, treating severely wasted children with the traditional protocol costs more than under the simplified protocol. Regardless of protocol, the findings suggest that scale is a major determinant in cost-efficiency.

Our study's results align with our previous CompAS study in Kenya (Bailey et al, 2018) and its accompanying effectiveness paper, which demonstrate that the simplified protocol reduced the dosage of RUTF for severely wasted children without reducing treatment efficacy.

While there is still much work to be done to improve wasting treatment for children, simplified, combined approaches can provide strong support through the reduction of costs to implementing agencies, ensuring that programmes can more readily be achieved at scale and at lower costs to caregivers and service providers.

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² We used the Malian minimum wage rate (CFA 28,465 per month or USD 50.34) to cost the time spent accessing treatment, as the survey demonstrated that almost all caregivers were not engaged in any income-generating activities.

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is important, as this skews the average cost per child treated. Including moderately wasted children may not result in reduced overall RUTF use and its associated costs, but it will increase cost-efficiency and allow more children to be treated – an important distinction for both programmers and donors.

Cost to clients

Total caregiver costs per visit – opportunity cost (time lost), foregone income, and out-of-pocket expenses – were estimated from survey results to be equivalent to a little over USD 1.0 per week.² Caregiver costs for severely wasted children (USD 8.0 for an average length of stay of 7.7 weeks) were higher than those of moderately wasted children (4.6 weeks) as more visits were required with more severe cases. The overall average caregiver cost was USD 5.9 for an average length of stay of 5.7 weeks for child treatment (Table 2).

Additional analysis of treatment provided by CHWs at secondary sites showed that visits are, on average, 57% more cost-efficient for caregivers compared to visits to primary treatment sites. This cost difference was driven primarily by reduced opportunity costs (time lost), as travel time was reduced and there was a steep reduction in out-of-pocket costs that were inherent when accessing primary health centres.

Costs to health system staff

The analysis of staff costs (by treatment site type) highlights increased cost-efficiency at secondary sites – USD 5.5 (primary sites) and USD 1.0 (secondary sites) per child treated. This is largely driven by staff salaries at primary sites, which encompass both formally trained (more expensive) health workers and CHW stipends. Despite the much larger caseloads that health facilities are able to treat, treatment at secondary sites is provided by only a single CHW. Staff treatment costs were around 5–6 times cheaper at secondary sites.

Overall, the average staff cost for all children treated was USD 3.7. Further research is ongoing around the costs associated with running secondary sites compared to primary health facilities.

The bottom line

Looking at the total costs for all agencies and caregivers, the cost per child treated under the simplified protocol was USD 165.9 (including support and in-kind RUTF costs), whereas the cost per child treated under the traditional protocol was USD 360.0 per child, even without the additional caregiver and MoH costs.

Study limitations

For caregiver and MoH staff costs, we were unable to perform pre- and post-analyses as we did not collect caregiver and MoH costs prior

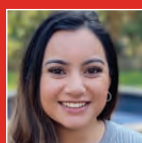


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A pregnant woman undergoing Mid-Upper Arm Circumference (MUAC) screening in Turkana County, Kenya.

Field Article

Maternal Mid-Upper Arm Circumference: Still relevant to identify adverse birth outcomes in humanitarian contexts?



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What we know:

Maternal mid-upper-arm circumference (MUAC) was found to be a reliable indicator for risk of subsequent low birth weight (LBW) following a comprehensive review of anthropometric indicators in 2013. However, optimal MUAC cut-off thresholds to identify poor birth and maternal outcomes have remained contentious, with different thresholds being recommended.

What this adds:

This scoping review analyses evidence after 2012 to determine whether more recent data sheds further light on optimal MUAC cut-off thresholds to identify those at risk of negative outcomes. The findings highlight that a MUAC cut-off threshold of <23 cm is predictive for identifying pregnant women at risk of adverse birth outcomes, particularly LBW.

Background

Establishing a practical anthropometric measurement, with an appropriate cut-off threshold, to identify pregnant women as undernourished in humanitarian settings can assist in the implementation of necessary interventions to avoid unfavourable maternal and birth outcomes. A key gap in maternal nutrition is that there is currently no agreed-upon standard set in the Sphere Handbook that defines maternal acute undernutrition through an optimal, context-specific MUAC cut-off point (Sphere Association, 2018).

In 2013, Médecins Sans Frontières Switzerland undertook an extensive literature review (Ververs et al, 2013) of articles published between January 1995 and September 2012 exploring anthropometric indicators that are able to identify pregnant women as acutely undernourished and at risk for adverse outcomes – including maternal mortality, low birth weight (LBW), intra-uterine growth restriction (IUGR), pre-term birth (PTB), small-for-gestational-age (SGA), and stunting at birth.

The review concluded that maternal MUAC can be used as a reliable indicator of risk of LBW. Maternal MUAC was identified as the preferential indicator, as opposed to body mass index, maternal weight for gestational age, maternal weight gain, or maternal stature. Maternal MUAC has a strong association with birth weight, is a simple measurement to take, particularly in humanitarian contexts, and is independent from gestational age. The proposed conservative cut-off value to enrol pregnant women in nutritional programmes, most frequently supplementary feeding programmes, was a MUAC of <23 cm.

This scoping review aims to analyse studies published after September 2012, specifically focusing on determining the specific MUAC cut-off threshold used to identify adverse birth and maternal out-

comes to understand if a MUAC of <23cm should be used rather than a MUAC of <21cm as is used in some humanitarian nutrition programmes.

Methodology

Data were abstracted from a comprehensive literature search conducted primarily in the PubMed and Embase electronic databases on literature published between September 2012 and October 2022. Additional eligible studies were sought after reviewing the reference lists of identified articles. The focus was on MUAC cut-off thresholds to identify risk of adverse birth and/or maternal outcomes (outcomes are listed in Table 1). PRISMA guidelines facilitated the preparation of this research protocol.

Inclusion criteria were: availability in full text, peer reviewed, in English, and focused on adult maternal anthropometry. This review was not specifically restricted to studies conducted in low- and middle-income countries or protracted humanitarian settings.

Since individual studies were not comparable and different approaches were taken for study analyses, a meta-analysis was not conducted. Data were synthesised based on the results of each individual study, and quantitative results were extracted and organised in thematic tables.

Duplicate publications and studies analysing the same study populations for similar outcomes were excluded. Additional exclusions consisted of results involving: twins, triplets, adolescents, substance abuse, anaemia, cigarette smoking, in-vitro fertilisation, drugs and hormones, disease, and obesity. The quality of studies was assessed using an adaptation of the Newcastle-Ottawa Quality Assessment Scale and the Joanna Briggs Institute Critical Appraisal Checklist.

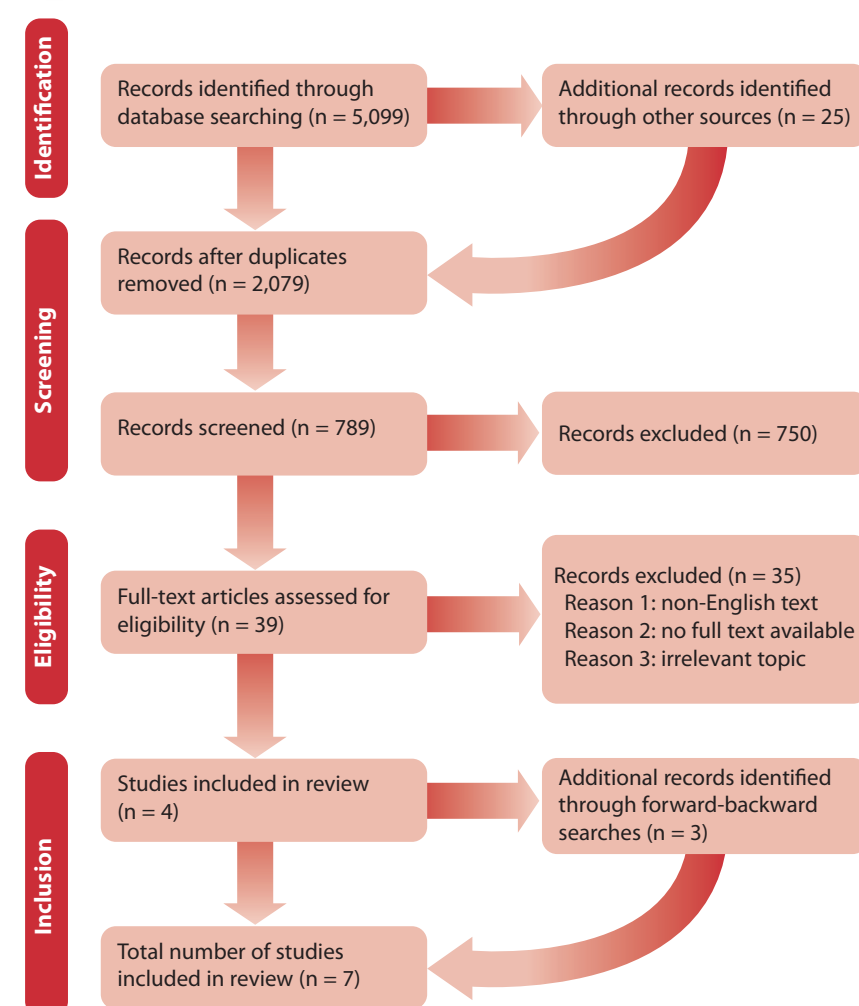
Table 1 Definitions of outcome measures used

Outcome	Definition
Low birth weight (LBW)	Newborn whose birth weight is <2,500 g.
Intra-uterine growth restriction (IUGR)	Foetus whose estimated birth weight is below the 10th percentile for its gestational age, birth weight <2,500 g for gestational age greater than 37 weeks, and abdominal circumference below the 2.5th percentile.
Pre-term birth (PTB)	Newborn whose birth is before 37 weeks of gestation.
Small-for-gestational-age (SGA)	Newborn whose weight below the 10th percentile for its gestational age.
Stunted at birth	Impaired linear birth: a newborn who falls below -2 standard deviations on the recommended length/height-for-age growth charts.
Maternal mortality	Pregnancy-related death, occurring during pregnancy and childbirth or within 42 days of termination of pregnancy.
Maternal morbidity	Any health condition arising from or complicating pregnancy and childbirth that affects overall well-being and/or functioning of the woman.

Findings

A total of 5,099 articles was initially identified. This was narrowed down to seven suitable articles – which were categorised as either ‘good’ or ‘fair’ quality – after multiple stages of review (Figure 1). The studies were conducted in Bangladesh, Cambodia, Ethiopia, Kenya, and India and included women delivering in hospitals (three studies), attending antenatal services (two

studies), or part of nutrition interventions (two studies). Three studies were cross-sectional in nature, two were cohort studies, one was a randomised control trial, and one was an unmatched case-control study. According to the adapted quality assessments based on specific study type, all included studies were deemed of good or fair quality, with none being categorised as poor quality.

Figure 1 Article identification and inclusion flowchart

The seven studies (Table 2) demonstrate the specific maternal MUAC cut-off threshold values and the corresponding birth outcomes of LBW, IUGR, SGA, and stunted at birth; sufficient data were not provided on maternal outcomes. Five of these studies indicate a MUAC of <23 cm as strongly predictive for identifying pregnant women as at risk for at least one of these adverse birth outcomes, while one study uses a MUAC cut-off value of ≤ 23 cm and another study used <22 cm. None of these cut-off values are found to be associated with gestational age.

Five of the studies looked at the adverse birth outcome of LBW, with evidence suggesting that a MUAC <23 cm was significantly associated with LBW. One study explored the birth outcome IUGR, and found a MUAC <23 cm measured at delivery to be associated with IUGR. Another study explored SGA and found no significant association with a MUAC <23 cm and SGA. Being stunted at birth was explored in two studies and a MUAC of <23 cm measured during the third trimester was associated with being stunted at birth, although this result was not statistically significant. No studies looked at outcomes such as PTB, maternal morbidity, and maternal mortality.

Discussion

This scoping review explored recently published literature concerning appropriate MUAC cut-off thresholds that can identify pregnant women as undernourished and at risk for adverse birth outcomes. Most of the studies identified utilised a MUAC threshold of <23 cm to identify pregnant women at risk for the following birth outcomes: LBW, IUGR, SGA, and stunted at birth. Results on maternal morbidity and maternal mortality were not sufficiently available.

All studies in Table 2 determined maternal MUAC cut-off values to be independent of gestational age, which is particularly important for humanitarian contexts since gestational age is often unknown for pregnant women in such emergency contexts.

A more recent cross-sectional study from Ethiopia found MUAC <23 cm to be significantly associated with adverse birth outcomes (adjusted OR= 5.93, 95% CI: 3.49, 10.08) (Degno et al, 2021). However, this study was not included in this scoping review because it broadly references ‘adverse birth outcomes’ among study participants, rather than specifying MUAC to be associated with individual birth outcomes.

The study from India (Vasundhara et al, 2019) that used a maternal MUAC cut-off value of ≤ 23 cm did not demonstrate any significant associations with LBW or SGA. Here, the usage of the ‘less than or equal to’ symbol ($\leq$) is unclear as it leaves the specific threshold open for interpretation. Since measurements were not completed in millimetres but rather in centimetres, it is unclear whether values between 23.1 cm and 23.9 cm or 23.4 cm were included in this threshold criteria.

The Sphere Handbook states to consider MUAC <21 cm as an appropriate cut-off for

Table 2 Studies post- September 2012 using maternal MUAC to identify adverse birth outcomes

Study	Study Population	Sample Size (n)	Study type	Time of MUAC Measurement	MUAC Cut-off Value	Statistical Test	LBW	IUGR	SGA	Stunted at Birth
Nyamasege et al. 2018 (Kenya)	PW enrolled in nutrition education programme	1,001 women	Cluster randomized controlled trial	Baseline and pre-birth	< 23 cm	OR (95% CI)	2.57 (1.15, 5.78)	n/a	n/a	n/a
Adane & Dachew 2018 (Ethiopia)	PW delivering in a hospital	662 women	Cross-sectional	Delivery	< 23 cm	OR (95% CI)	3.4 (1.38, 8.60)	n/a	n/a	n/a
Vasundhara et al. 2019 (India)	PW attending antenatal services	928 women	Prospective cohort	1st and 2nd trimester	≤ 23cm	OR (95% CI)	1.083 (0.46, 2.58)	n/a	0.90 (0.42, 1.93)	n/a
Siyoun, Melese 2019 (Ethiopia)	PW delivering in a hospital	330 women	Unmatched case-control	Delivery	< 22 cm	OR (95% CI)	2.89 (1.58, 5.29)	n/a	n/a	n/a
Kpewou et al. 2020 (Cambodia)	PW attending antenatal services	779 women	Longitudinal	3rd trimester	< 23cm	OR (95% CI)	n/a	n/a	n/a	1.621 (1.00, 2.64)
Tesfa et al. 2020 (Ethiopia)	PW delivering in a hospital	803 women	Cross-sectional	Delivery	< 23 cm	OR (95% CI)	n/a	2.10 (1.39, 3.01)	n/a	n/a
Haque et al. 2021 (Bangladesh)	PW enrolled in household-based nutritional programme	5,069 women	Cross-sectional	N/A	< 23 cm	OR (95% CI)	1.77 (1.61, 1.96)	n/a	n/a	1.32 (1.19, 1.47)

Statistically significant values are in bold ($p < 0.05$). Grey cell indicates no data available

the selection of pregnant women at risk during emergencies (it also states that a MUAC of <23 cm indicates a moderate risk among pregnant women, although moderate risk is not defined (Sphere Association, 2018)). The findings from this review do not support the presented statement, as it has been demonstrated that there is a clear risk of low birthweight found with MUAC <23 cm, with potential associations with other birth outcomes; therefore, we are not in agreement that <21 cm is an appropriate cut-off value to indicate pregnant women as at risk during emergencies.

Though both the previous Médecins Sans Frontières study from 2013 and this scoping review suggest using MUAC <23 cm for pregnant women as an indicator of risk for adverse birth outcomes in humanitarian contexts, we do not have sufficient information to determine if MUAC also can be used as an indicator predicting the potential benefit (e.g., improved foetal growth) of a certain nutritional intervention. Additional information is required on which nutritional interventions with enrolment based on MUAC can sufficiently avert adverse risks.

Lastly, there is a substantial focus in the studies identified on MUAC and adverse *infantile* or *foetal* outcomes. However, there is significant need to have more information on adverse *maternal* outcomes.

Limitations

Limitations of the current literature include the lack of research on maternal outcomes. Additionally, these studies lack focus on humanitarian emergencies or conflict settings, although their findings are still applicable to such contexts. Additionally, only seven studies were included in the final results, meaning that conclusions need to be met with a certain degree of caution. This further highlights the need for more research on this important topic.

Limitations of this scoping review include potential bias due to having only one quality

assessment reviewer, lack of comparability between studies due to variations in sample size, methodology, and context, exclusion of studies not available in English that may contain valuable results, and the omission of non-peer-reviewed grey literature, which could have provided noteworthy data.

Recommendation

A recommendation for future research would be to study the enrolment of pregnant women in nutritional interventions based on the use of MUAC <23 cm in efforts to reduce the risk of adverse outcomes. Additionally, future studies should not solely focus on adverse birth outcomes but also maternal outcomes.

Conclusion

The currently available research supports using maternal MUAC as the most appropriate anthropometric measurement and rapid assessment tool for identifying pregnant women as acutely undernourished and potentially in need of nutritional intervention to prevent adverse birth outcomes.

This is particularly noteworthy in resource-limited settings, such as protracted humanitarian settings or emergencies. An advantage of measuring MUAC is that it requires minimal training and is reliable in identifying nutritional status. Initially, there has been no universal absolute cut-off value identified; however, this review supports the specific cut-off threshold for maternal MUAC in this context as <23 cm.

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Editor's note

The importance of developing guidance to treat maternal undernutrition in humanitarian contexts for both improved birth and maternal outcomes is currently being explored within a Women's Nutrition Taskforce established within the Global Nutrition Cluster Technical Alliance. The results of this review are being used by the Taskforce to inform the development of operational guidance for women's nutrition in humanitarian contexts.

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Adding proteins to lipid-based nutrient supplements in Uganda: Which was best?

This is a summary of the following paper: Mbabazi J, Pesu H, Mutumba R et al. (2023) Effect of milk protein and whey permeate in large quantity lipid-based nutrient supplement on linear growth and body composition among stunted children: A randomised 2x2 factorial trial in Uganda. *PLOS Medicine*, 20. <https://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1004227>

Lipid-based nutrient supplements (LNS) have been shown to effectively treat undernutrition in multiple settings. To improve the nutrient profile and, specifically, raise the protein content, milk powder is often added to LNS as a primary ingredient. However, milk is a costly ingredient that raises the price per unit of LNS and may be less sustainable than alternatives.

To assess the effects of different proteins added to LNS, the researchers analysed secondary data from the Milk Affecting Growth, Cognition, and the Gut in Child Stunting (MAGNUS) trial. MAGNUS used a double-blinded, randomised 2x2 factorial design (Figure 1) (600 participants) with an untreated control group (150 participants). The trial tested the effects of four large quantity LNS formulations (Box 1).

Children aged 12–59 months with a height for age Z-score < -2 and weight-for-height ≥ -3 were referred for assessment and eligibility screening from two study sites in eastern Uganda.

Milk protein and whey permeate resulted in no differences in height, but milk protein more readily increased fat-free mass. Adding

dairy to LNS did not appear to offer further benefits for linear growth or body composition in this group. Unsupplemented children continued to become more stunted, whereas supplemented children had a 0.17 Z-score recovery in height while also gaining fat-free mass.

“Supplementation with LNS, irrespective of milk, supports linear catch-up growth and accretion of fat-free mass, but not fat mass”

The study assessed numerous secondary outcomes that are beyond the scope of this summary. Given the overall findings, the authors propose that large quantity LNS should be considered in programmes to treat stunting.

The study featured robust methodology and an appropriate sample size based on the effect size estimates. There was a low dropout rate and minimal missing data. Randomisation and double blinding increase the validity of results, so we can interpret these findings with a high degree of confidence. The researchers opted to study children aged 12–59 months to minimise breastfeeding confounding. We should be cautious when extrapolating these findings to other age groups.

¹ <https://pubmed.ncbi.nlm.nih.gov/26864368/>

Box 1 How do the four interventions compare?

The treatment group received one sachet of LNS (100g/day) for 12 weeks. The energy and macronutrient content of each intervention was matched. Each sachet provided 530–535kcal, which is around half the average daily energy requirement for a child. All daily micronutrient requirements were met. Nutrition counselling was offered to all caregivers upon entry to the study.

Milk protein: Dry milk powder, which is the *de facto* ingredient in many LNS formulations. May support growth and fat-free mass accretion.

Whey permeate: A byproduct of cheese-making, which is significantly cheaper than milk powder. Proposed as an alternative to milk powder, although its protein content is significantly lower.

Soy protein: Non-dairy alternative protein source, which is less expensive and more sustainable than milk protein. Some evidence that soy may be less effective than dairy for growth and recovery¹, although further research is required.

Maltodextrin: Carbohydrate-based, inexpensive additive used as a thickening agent and preservative in processed foods. No fat or protein content. No known therapeutic benefit for this population.

Figure 1 2 x 2 factorial design

600 participants, evenly allocated	Whey permeate	Maltodextrin
Milk powder	Height (cm) Knee–heel length (mm)	Height (cm) Knee–heel length (mm)
Soy protein isolate	Height (cm) Knee–heel length (mm)	Height (cm) Knee–heel length (mm)



A mother and her baby receiving nutritional supplements at a health centre in Yumbe district, Uganda.

The elderly: A forgotten group in humanitarian crises?

This is a summary of the following paper: van Boetelaer E, Brown J, Vaid S et al. (2023) *Elderly people in humanitarian crises, a forgotten population: A call for action*. PLOS Global Public Health, 3, 7, e0002142. <https://journals.plos.org/globalpublichealth/article?id=10.1371/journal.pgph.0002142>

This short opinion paper raises important questions about the increasing global elderly population, as many countries shift towards aging populations.

“The proportion of the population aged 50 and over in fragile countries, where conflict and disasters are more likely to cause greatest harm, is expected to rise from 12.3% (219.9 million) in 2020 to 19.2% (586.3 million) in 2050.”

The authors highlight the views of the United Nations High Commissioner for Refugees, which has stated that trauma, chronic undernutrition, and disease exposure will create a greater toll on ‘older people’, with adverse age-related challenges likely to occur earlier in crisis-affected populations. We may therefore need to move beyond defining people by age – which might not adequately capture a person’s morbidity and mortality risk.

One area where the elderly are particularly at risk is when climate emergencies occur. Acute shocks (such as heatwaves, cold snaps, and droughts) may exacerbate pre-existing health

conditions. The same conditions may also limit mobility during crises that require relocation (e.g. flooding). Elderly people are also more likely to be dependent on social and financial support networks and healthcare systems, creating further risks if these important lifelines become disrupted during an emergency.

Despite this group being more vulnerable in general (compared to younger adults), the authors note that ‘elderly people’ are not a homogenous group and different members of this population will have a blend of risk multipliers and mitigators. As well as biological age, which affects all disease processes and health stressors, additional vulnerabilities arise from female gender, being widowed, increased exposure to trauma (over time), prior mental health problems (worsened by social isolation), low income, poor education, and rural residency.

Guidance does exist on age-inclusive humanitarian assistance – yet this group is rarely included in the design, implementation, and evaluation stages of humanitarian interventions. Elderly voices remain unheard and, as a result,

there is a lack of data from needs assessments as to how responses can meet and are meeting the requirements of this group. The authors highlight shelter provision, water supply, toilets, and food distribution points as examples of areas where elderly accessibility is not often prioritised.

From an ethical standpoint, providing humanitarian assistance for all remains a basic human right. The focus on younger groups seems rational through a productivity lens (i.e. these groups are or will be economically productive, providing a better return for humanitarian investment), but deprioritises those who cannot play an active role in the workforce. Even though elderly people possess unique skills and experience from living through previous disasters – experiences that are useful for societies in these areas – their voices go unheard, and their needs are removed from the equation.

The proposed solution to this is to include elderly people in all phases of the humanitarian programme cycle. The authors note that this will require deliberate and structured efforts, which in turn requires more work from the aid community. If interventions are also expanded to this group, this will inevitably require more funding. Yet the payoff is in access to elderly people’s previously untapped knowledge and insight, which can result in more appropriate and effective response plans.

Above all, this approach has a strong ethical foundation, given that the provision of appropriate and accessible humanitarian assistance for all is a basic human right.

Prebiotics for severe wasting: Evidence from a randomised controlled trial in Pakistan

This is a summary of the following paper: Batool M, Saleem, J, Zakar R et al. (2023) *Double-blind parallel treatment randomized controlled trial of prebiotics’ efficacy for children experiencing severe acute malnutrition in southern Punjab, Pakistan*. Children, 10, 5, 783. <https://www.mdpi.com/2227-9067/10/5/783>

The aim of this study was to assess whether adding prebiotics to ready-to-use therapeutic food (RUTF) improved nutrition and clinical outcomes for severely wasted children aged 6–59 months without medical complications. Although comparable studies have been conducted in different settings, this was the first double-blinded, randomised, controlled trial in Pakistan – a country with a particularly high burden of child malnutrition and mortality. Wasting was defined as the presence of bilateral pitting oedema (grades 1–2) and a weight-for-age z-score of <-3 or mid-upper-arm circumference (MUAC) of <11.5cm.

Children were randomised in a 1:1 ratio to the intervention and control arms. The intervention consisted of a standard RUTF treatment with 4g galacto-oligosaccharides, whereas the control arm used RUTF with added starch. All

sachets (intervention and placebo) were labelled with sequence numbers and had similar texture and appearance to ensure blinding. Other than the food used, children from both groups received similar treatment that followed the national guidelines. Despite a modest dropout rate, the final sample size exceeded what was required, increasing study power (n=204).

At endline, children in the intervention group were significantly heavier, had greater MUAC scores, and had more favourable blood markers.¹ No adverse events were suspected or reported. Although there were significant differences between the two study arms at baseline, all differences became more pronounced and more significant when measured again at follow-up – highlighting that, although some groups may have been inherently biased, this may not have disrupted the findings given the effects observed. There were no significant

differences in weight or MUAC between the two arms at baseline, so we can be more confident of these anthropometric findings at follow-up.

Notable limitations affect the interpretation of these otherwise strong findings. Firstly, the two-month follow-up period was particularly short, so this experiment would have to be repeated over a longer duration to determine whether there are long-term benefits. Secondly, by selecting cases without medical complications, the trial potentially enlisted a group of ‘hyper responders’ primed for treatment. In a programmatic setting, a broader pool of more complex cases and/or less wasted children would be treated, which may lead to less pronounced effects. Thirdly, oligosaccharides are but one variation of prebiotics and research on the gut and the microbiome is a relatively new field, so the authors also suggest additional research with other formulations is needed to determine whether this effect is true for all prebiotics, as well as to establish the optimal type and dosage of prebiotic that would yield the best outcomes.

Nevertheless, these results are compelling, and the authors note that “supplementation with RUTF and prebiotics has proven to be an efficient, effective, and safe therapy for children suffering from uncomplicated severe acute malnutrition (wasting).”

¹ Haemoglobin, haematocrit, mean corpuscular volume, mean corpuscular haemoglobin, platelets, and serum albumin were all measured in this study.

Post-recovery relapse and a simplified protocol: A study of children in Mali

This is a summary of the following paper: Kangas S, Coulibaly I, Tausanovitch Z et al. (2023) *Post-recovery relapse of children treated with a simplified, combined nutrition treatment protocol in Mali: A prospective cohort study. Nutrients*, 15, 11 <https://www.mdpi.com/2072-6643/15/11/2636>

High relapse rates have been observed in children recovering from an episode of wasting, yet limited data are available on the incidence of relapse and its associated factors. At the same time, so-called 'simplified protocols' – which often incorporate a reduced ready-to-use therapeutic food (RUTF) dose – have shown promise in Mali, as well as other settings.¹ In Mali, the relapse rate of children treated using a simplified and combined protocol is unknown. This prospective cohort study sought to quantify this by enrolling children treated with this regimen, exploring factors associated with relapse.

This study was nested within an ongoing effectiveness study implementing the simplified and combined protocol in 35 health areas within a health district of Nara, southwestern Mali. Within this, a random sample of 10 health areas was selected for study – which incorporated 10 health centres and 18 community health sites – with a total of 420 children included in the study. Eligibility was defined as any child in the selected health

areas who had achieved recovery – classed as mid-upper arm circumference (MUAC) ≥ 125 mm and no oedema for two consecutive measurements over two weeks – who was not planning on relocating during the study period and where there were no security risks to the study. Children were followed up at home fortnightly for six months.

The incidence of relapse into MUAC < 125 mm was high (26%), but was low (1.6%) for MUAC < 115 mm and/or oedema. This is higher than comparable studies, yet explainable by the extended follow-up period. The incidence rate of relapse was 4.8 per 100 child months. Lower age, lower anthropometry at admission and discharge, and higher number of illness episodes were predictive of relapse. Having a vaccination card, using an improved water source, having agriculture as a main source of income, and increases in caregiver workload were protective.

Dietary pattern was not found to predict relapse in this study, which runs contrary to a *priori* understanding – that diet is an underlying cause of malnutrition. This may indicate that,

for this cohort, malnutrition is attributable more to disease than dietary intake, which is supported by the strong predictive value that illness episodes had on relapse incidence in this setting. This finding may be confounded by very poor dietary diversity observed across the cohort, which could mask dietary intake as a predictor of relapse given this homogeneity.

Information bias may have been present in this study as some measures were systematically incomplete for all children. This was mitigated with imputation (adding replacement data) (e.g., for height). Investigating seasonal differences in relapse were also beyond the scope of this study design, although seasonal effects are unlikely to be specific to relapse incidence but rather associated with malnutrition incidence in general. A lack of control group rules out investigation of the role of simplified protocols in relapse. However, the study incorporated a robust methodology, outlining the caveats of the findings in detail, allowing for effective conclusions to be made from this work. Given the relatively high relapse rate, the authors conclude:

“Discharge criteria may need to be reconsidered, either by expanding the MUAC criteria or adding weight-for-age, in order to allow for a more sustained recovery from malnutrition.”

¹ <https://www.rescue.org/report/simplified-combined-protocol-evidence-overview>

The long-term impacts of multiple micronutrient supplementation in children aged 24 to 59 months in Pakistan

This is a summary of the following paper: Khan A, Ul-Haq Z, Fatima S et al. (2023) *Long-Term Impact of Multiple Micronutrient Supplementation on Micronutrient Status, Haemoglobin Level, and Growth in Children 24 to 59 Months of Age: A Non-Randomized Community-Based Trial from Pakistan. Nutrients*, 15, 7, 1690. <https://doi.org/10.3390/nu15071690>

This non-randomised, community-based clinical trial evaluated the effect of a locally produced micronutrient powder (Vita-Mixe) on micronutrient status (zinc, vitamin A, and vitamin D), haemoglobin level, and growth parameters in children aged 24–59 months. The trial took place in a low-resource, rural area in Kurram, Pakistan between January 2018 and June 2019 as part of a broader clinical trial, 'Ready to Use Supplementary Foods to Prevent Stunting Among Children Under Five Years in Kurram Agency'. Children aged 24–48 months were recruited and assigned to either an intervention or control arm. One sachet of micronutrient powder (1g) was given to the 111 enrolled children in the intervention arm (n=58) every other day for 12 months. The intervention provided an additional 50% of the reference nutrient intake per day for each micronutrient. Using blood samples taken at baseline and one year after the intervention, micronutrient and haemoglobin levels were assessed.

The study compared changes in the intervention group and control group. Results showed that children in the intervention arm had an average 7.52 ng/mL ($p < 0.001$) increase in plasma vitamin A, a 4.80 ng/mL ($p < 0.002$) increase in vitamin D, and a 33.85 μ g/dL ($p < 0.001$) increase in zinc, as well as a 2.0g/dL ($p < 0.001$) increase in haemoglobin count. Significant improvements were observed in weight-for-height z-scores and weight-for-age z-scores in the intervention group ($p < 0.001$), although no statistically significant changes were observed in height-for-age z-scores in the intervention group ($p = 0.93$).

The researchers concluded that one-year supplementation of micronutrient powder is a cost-effective and scalable intervention for food-insecure areas/households to address the alarming rates of undernutrition in Pakistan and other developing countries. The authors highlighted that uninterrupted micronutrient powder supply, compliance, and no loss to follow-up were among the strengths of their study.



The non-random allocation of participants may have introduced selection bias into the study. This was done to prevent contamination between intervention and control arms – as participants were allocated by distinct regions – so, on balance, this approach was appropriate. We also need to consider that children with various comorbidities and severely malnourished children were excluded. This produced appropriate study conditions; however, in a real-world setting where the intervention may be delivered as a blanket supplementary feeding programme to all, sicker children may not recover as readily as those featured in this study. Additionally, growth data were only measured at two time points, which prevents us from determining recovery trajectories over the study period. Nevertheless, the results remain compelling.

Anaemia prevalence and causes among Syrian refugee children in Lebanon

This is a summary of the following paper: Jeremias T, Abou-Rizk J, Burgard L et al. (2023) *Anemia among Syrian refugee children aged 6 to 23 months living in greater Beirut, Lebanon, including the voices of mothers' and local healthcare staff: A mixed-methods study*. *Nutrients*, 15, 700.

<https://www.mdpi.com/2072-6643/15/3/700>

Iron deficiency remains the most common nutrient deficiency in the world – causing an estimated 30–50% of anaemia cases in children. An estimated 40% of children aged 6–59 months and 36% of pregnant women aged 15–49 years are anaemic worldwide.

Syrian refugees in Lebanon – a country with underlying food insecurity brought about by a protracted economic crisis – are a particularly vulnerable group. However, there is a paucity of data for this group. This cross-sectional study aims to first quantify the prevalence of anaemia among 215 Syrian refugee children aged 6–23 months and their mothers (haemoglobin (Hb) finger prick and anthropometry). The study then identifies dietary and socio-economic determinants of anaemia, before investigating the relevant attitudes and perceptions of Syrian mothers and Lebanese healthcare staff (multi-component questionnaire). The qualitative assessment focused on 43 Syrian mothers and four Lebanese healthcare staff.

Child anaemia prevalence was 42% (29% mild, 13% moderate), which is in line with other studies and reflects a severe public health problem according to the World Health Organization. Comparison with other studies and data sources implies a worsening trend of anaemia in Beirut. Twenty percent of mothers were anaemic (15% mild, 5% moderate). Children were 3.5 times more likely to be anaemic if the mother was also anaemic.

Socioeconomic variables were found to not be determinants of anaemia among children aged 6–23 months, but the authors point to a homogenous study population as an explanation for this surprising finding. Mothers were generally able to describe some symptoms of anaemia, but knowledge on quality dietary sources of iron was poor. Compliance with iron supplementation protocols was found to be hampered by poor availability of supplements, financial constraints, and side effects such as vomiting. We encourage readers to review the detailed qualitative findings

in the original paper, which are beyond the scope of this summary.

The sample size for the main study was appropriate based on the authors' sample size calculation. The use of biomarkers is a strength of this study and the Hb cutoffs for study participants are in line with World Health Organization guidance for mild, moderate, and severe anaemia. A major caveat is that we are unable to distinguish non-iron deficiency anaemia from iron-deficiency anaemia, as no specific iron measures were taken – this reduces study specificity.

The sample size for the qualitative study is small, so its results should be interpreted with caution. The qualitative aspect may be affected by selection bias from both the researchers, who used convenience sampling to find participants, and those who accepted invitation to interview, who are unlikely to be representative. The study was also conducted in a small, urban area in a country that hosts an estimated 1.5 million Syrian refugees who are dispersed across the nation – so this is unlikely to capture the experiences of the broader group. Like all dietary recall studies, reporting bias may have been introduced, although steps were taken to ameliorate this during the study. Reverse causality cannot be ruled out with this study design. Nonetheless, this study highlights the high burden of anaemia among children aged 6–23 months and its key determinants in this population.

Food vouchers for moderate acute malnutrition: Evidence from Northern Cameroon

This is a summary of the following paper: Teta I, Foudjo B, Nielsen J et al. (2023) *Outcomes of a food voucher program and factors associated with the recovery rate of children with moderate acute malnutrition in far north Cameroon*. *Journal of Health, Population and Nutrition*, 42, 37.

<https://jhpn.biomedcentral.com/articles/10.1186/s41043-023-00379-1>

Moderate wasting remains prevalent around the world but receives less research attention than severe wasting. This quasi-experimental study investigated the effects of a food voucher programme on overall recovery rates in eligible children in a rural, agricultural area within northern Cameroon. This was a longitudinal cohort study that defined recovery as a mid-upper arm circumference (MUAC) >125mm. Moderate wasting was defined as between ≥115mm and ≤125mm (Box 1).

Overall, 28,292 children aged 6–59 months were flagged by community health workers, with 2,126 then confirmed as moderately wasted by health centres.¹ Of these children, 333 were included in the study, which was conducted between January and August 2020. Children were excluded if they were severely wasted, severely ill, or if they refused to participate.

The intervention involved a CFA 8,000 (USD 15) voucher that could be redeemed for a standardised basket of food defined using NutVal²

software. The food basket was designed to provide adequate nutrients in combination with the existing diet, plus a small surplus to accommodate intra-household food sharing.

The overall recovery rate of enrolled children was 78.3%, with a significant increase in MUAC over time ($p<.001$). Unfortunately, 10.5% ($n=50$) deteriorated into severe wasting, 3.4% remained moderately wasted post-intervention, and 7.2% were lost to follow-up. Over half the children (56.1%) were recovered at the first of six visits.

The minimum sample size, based on the researchers' calculation ($n=456$), was not reached for this study so there is an increased likelihood of both false negative and false positive results. Although these results are significant, they may be unreliable. Taking previous studies into account and given the high recovery rate, there nevertheless appears to be value in this intervention. However, determining whether this is the most efficacious or cost-effective intervention requires additional research.

The use of a quasi-experimental design – without a comparison group – is a limitation, although there was no standardised moderate wasting treatment in this setting to compare against, so this study design was necessary. There was also no follow-up beyond the study period, so we are unable to determine whether children relapsed at a later point. Given the number of children who opted out of the study, with only 15.6% of the eligible population included, it is likely that selection bias was present. The researchers do provide descriptive statistics for the study population, which is a strength, but we cannot infer whether the population is representative without reference data for the broader area.

Box 1 A note on cut-offs

MUAC cut-offs are defined and applied in a variety of ways based on the programme or implementing agency. As cut-offs are an artificial point on a spectrum of malnutrition, they are limited as they do not always correlate to morbidity and/or mortality, which are the truly important measures when considering recovery rates. However, they are necessary as they allow programme resources to be prioritised to those most at risk. In this study, the cut-off for moderate wasting is in line with current World Health Organization guidelines.

¹ Those with severe wasting were treated according to government protocols in a separate programme.

² <https://www.unscn.org/en/resource-center/archive/methods-tools-and-indicators?idnews=1463>

A meta-analysis looking into moderate acute malnutrition interventions

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Acute malnutrition screening. South Sudan.

This is a summary of the following paper: Cichon B, Das J, Salam R et al. (2023) Effectiveness of dietary management for moderate wasting among children >6 months of age – A systematic review and meta-analysis exploring different types, quantities, and durations. *Nutrients*, 15, 5.

<https://www.mdpi.com/2072-6643/15/5/1076>

This systematic review and meta-analysis investigated the effect of multiple food intervention categories alongside standard clinical care on moderate acute malnutrition. A broad spectrum of interventions was included at different doses, roughly broken down into: non-specially formulated foods (e.g., home foods); lipid-based nutrient supplements (LNS); fortified blended foods; and non-fortified blended foods. A flowchart describing the detailed categories of interventions, as well as the exact search terminology employed across the nine selected databases, can be found in the original paper.

The study population was children aged >6 months with moderate wasting.¹ The outcomes of interest were: i) anthropometric recovery / outcomes (weight-for-length, weight-for-age, mid-upper arm

circumference, weight and height gain); ii) sustained recovery; iii) deterioration to severe wasting; iv) time to recovery; and v) non-response relapse. No language or date restrictions were applied to the search up until 23 August 2021.

The initial search yielded 32,180 studies, which was reduced to 22 papers (17 studies) after review. Studies were randomised controlled trials conducted in Africa (n=16) and Asia (n=1) between 2009 and 2021.

Due to the size of the analysis, a full breakdown of each outcome category and intervention vs intervention sub questions is beyond the scope of this summary. Overall, LNS offered small benefits to recovery and anthropometric indices compared to fortified blended foods. There was no significant difference in LNS vs enhanced fortified blended foods for recovery, anthropometry,

and morbidity. LNS may be superior to enhanced fortified blended foods for weight gain (weight-for-height and mid-upper arm circumference), but the effect size is small. There was no difference in recovery when ready-to-use therapeutic and ready-to-use supplementary food were compared.

The data in this study were heterogeneous, making it difficult to compare so many different intervention categories, products, regimens, outcomes, and timelines. Essentially, this study only provides evidence in African settings, as 94% of the included studies came from the continent – which in itself is diverse – so we cannot extrapolate this to other settings without further evidence. No studies compared specially formulated foods to home foods, which is an evidence gap.

The use of multiple comparisons, and subsequent research questions asked, may increase the risk of findings being due to chance. Given that effect sizes were small, the results cautious, and the findings being broadly in line with other evidence, the authors note that:

“LNS may be preferable compared to the ‘outdated’ corn soy blend and less enhanced fortified blended cereals. However, given the small difference in treatment outcomes... any programmatic decision on which of these to choose may therefore want to consider acceptability, availability, as well as cost and cost-effectiveness.”

¹ Defined as weight-for-height z-score of ≥ -3 and < -2 and/or a mid-upper arm circumference of ≥ 11.5 cm and < 12.5 cm or a weight-for-height between > 70 and $< 80\%$ of the median and no oedema, treated either as inpatients or outpatients.

Cambodia: Vitamin A and iron status remain unaffected by ready-to-use therapeutic food

This is a summary of the following paper: Sigh S, Roos N, Chhoun C et al. (2023) Ready-to-use therapeutic foods fail to improve vitamin A and iron status meaningfully during treatment for severe acute malnutrition in 6–59-month-old Cambodian children. *Nutrients*, 15, 4, 905.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9961841/>

This randomised controlled trial collected baseline and follow-up data on micronutrient status after an eight-week intervention on uncomplicated severely wasted children aged 6–59 months. Severe wasting was defined as a weight-for-height z-score ≤ -2.8 or mid-upper-arm circumference ≤ 115 mm and/or the presence of nutritional oedema.

The intervention was a novel ready-to-use therapeutic food (RUTF) (NumTrey; a wafer filled with a fish-based paste) compared to a regular milk-based RUTF (BP-100™) as a control. The trial took place between September 2015 and January 2017 in an urban setting (Phnom Penh, Cambodia). Food rations in each arm were based on national standards by child weight (160–180 kcal/kg). Analysis of results showed minimal impact of both locally

produced and standard RUTF on micronutrient status, which is a similar finding to other relevant studies. There was no significant difference for haemoglobin, iron status, inflammation, vitamin A status, or anaemia between baseline and discharge ($p > 0.05$), and no significant difference for any of these measures between control and intervention groups ($p > 0.05$). Given these results, the authors suggest the need for further research on how to enhance the effectiveness of SAM treatment on micronutrient status.

However, the results of this study should be interpreted with caution due to several caveats.

Minimal impact could be attributed to the short follow-up period, which may not have been long enough to reflect changes in micronutrient status – which can take 1–6 months in

some cases. A standard sample size calculation indicated that the study should include 120 children to detect a 10% difference in effect. A high dropout rate ($\approx 40\%$) resulted in 37 participants per arm included in the final analysis – so this trial was underpowered, reducing the chance of detecting a true effect. Although micronutrient status was a secondary outcome, meaning this calculation is not relevant for this aspect of the study, the dropout rate and subsequent small sample size remain significant considerations when interpreting these results.

At baseline, the prevalence of anaemia, haemoglobinopathies, iron deficiency, low body iron, and vitamin A deficiency was higher among those randomised to the control group, which may inflate the effects of the intervention arm. More males (60%) featured in this study than females (40%) at admission, but this was more pronounced in the control (64:36%) compared to intervention (55:45%) arm. This may be the cause of greater anaemia prevalence in the control arm, as male children are more likely to be anaemic.^{1,2} This highlights the importance of matching control and intervention groups in small studies³ to minimise the challenges of interpreting results.

¹ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7993607/>

² <https://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0113756&type=printable>

³ <https://jnnp.bmj.com/content/75/2/181>



Conditional cash transfers combined with audio messaging: Mixed success in Somalia

Cash assistance through mobile money in Somalia

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This is a summary of the following paper: Grijalva-Eternod C, Jelle M, Mohamed H et al (2023) Evaluation of conditional cash transfers and mHealth audio messaging in reduction of risk factors for childhood malnutrition in internally displaced persons camps in Somalia: A 2 x 2 factorial cluster-randomised controlled trial. *PLOS Medicine*, 20, 2.

<https://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1004180>

This trial analysed the impacts of two interventions – conditional cash transfers (CCTs) and mobile health (mHealth) audio messaging – on assorted health and nutrition outcomes in children aged 0–59 months, using a randomised 2x2 factorial design (Figure 1). The trial took place in peri-urban, internally displaced person camps in Mogadishu, Somalia over a nine-month period. Baseline, midline, and endline measurements were taken.

The cash transfer programme consisted of USD 70 per household per month for three months, followed by USD 35 per household per month for a further six months. The former reflected 80% of the minimum expenditure basket (cost for one month of essential needs) in the study area. All study participants received the same level of cash transfer, with women being the target recipient within each household.

The **cash transfer conditionality intervention** was a one-time requirement for all children to attend baseline health screening at a local clinic and receive a health record card.

The **mHealth intervention** consisted of a series of 30 pairs of health-promoting audio

messages. Each message pair contained a two-minute drama and a one-minute reinforcement message transmitted on separate days. Six topics were included: 1) vaccination; 2) water, sanitation, and hygiene; 3) infant and young child feeding practices; 4) identifying signs of serious illness; 5) acute malnutrition treatment; and 6) maximising health and nutrition in the household.

There was no evidence that mHealth increased mothers' knowledge (health and nutrition), but household dietary diversity did increase (OR 3.75, $p < 0.001$). However, child dietary diversity did not increase significantly, and nor did any of the vaccination outcomes. The mHealth intervention had no effect on the risks of acute malnutrition, measles, all-cause morbidity, and diarrhoea.

The conditional cash transfer significantly improved measles vaccination coverage from 39% to 77.5% ($p < 0.001$) and Pentavalent series completion from 44.2% to 77.5%. However, there was no change in household or child dietary diversity or in mortality, acute malnutrition, diarrhoea, or measles infection incidence over the follow-up period.

The study featured robust methodology and an appropriate sample size calculation. That said, the actual sample size was below what was planned, which may reduce study power and exaggerate any effect size presented. Due to the complexity of the study design, multiple statistical tests were conducted, which in turn increases the risk of erroneous results due to chance. mHealth messages were created with a local company and local dialects, yet they had not been validated prior to this intervention, affecting study reliability.

The researchers provide a clear breakdown of dropouts, deaths, and children lost to follow-up. This is a strength, as we can see that the mHealth + UCT group had a higher proportion of absentees throughout each study point compared to the other groups, which may affect interpretation.

In summary, the interventions did not appear to offer much benefit in the population for the outcomes that were included. However, conditionality of the cash transfer did increase vaccination coverage, which in turn could offer a route to increased participation with local health systems – which may offer further benefits to health and nutrition.

Figure 1 2x2 factorial design

	mHealth Intervention Arm	No mHealth Control Arm
CCTs Intervention Arm	Vaccination coverage, caregiver knowledge, child dietary diversity, acute malnutrition, other assorted health and nutrition outcomes (n=178, endline)	Vaccination coverage, caregiver knowledge, child dietary diversity, acute malnutrition, other assorted health and nutrition outcomes (n=168, endline)
Unconditional Cash Transfers (UCTs) Control Arm	Vaccination coverage, caregiver knowledge, child dietary diversity, acute malnutrition, other assorted health and nutrition outcomes (n=198, endline)	Vaccination coverage, caregiver knowledge, child dietary diversity, acute malnutrition, other assorted health and nutrition outcomes (n=181, endline)

Antenatal malaria prophylaxis plus iron and folic acid for child nutrition outcomes

This is a summary of the following paper: Godha D, Tharaneey M, Nanama S et al. (2022) *The association between iron and folic acid supplementation and malaria prophylaxis and linear growth among children and neonatal mortality in Sub-Saharan Africa – A pooled analysis*. *Nutrients*, 14, 2296. <https://pubmed.ncbi.nlm.nih.gov/36364759/>

Many studies have highlighted a positive association of iron and folic acid (IFA) supplementation during pregnancy with foetal growth and birth weight. However, few have explored associations with a child's linear growth beyond birth. Moreover, much of the evidence base has been built in South Asia. In sub-Saharan Africa (SSA), malaria remains endemic, which complicates interventions. Malaria infection increases the risk of anaemia, while also reducing iron absorption, yet IFA supplementation increases malaria risk, with iron deficiency reducing it.

This study aimed to explore whether a combined antenatal regimen of IFA supplementation and malaria prophylaxis influences linear growth outcomes among children. A pooled analysis was conducted using recent Demographic and Health Survey data from 19 SSA countries. Four outcomes were analysed: severe stunting, stunting, height-for-age z scores (as a continuous variable), and neonatal mortality. In total, results from a sample size of 56,388 children (for severe stunting, stunting, height-for-age z-scores) and 90,503 (for neonatal mortality) were analysed.

A full breakdown of the methodology used and the specific results by country are beyond the scope of this summary. Both can be found in the original paper.

The odds of stunting were found to be 10% lower for children of mothers who received malaria prophylaxis (OR 0.90, $p < 0.05$) after adjusting for multiple factors. No similar association was noted with severe stunting. After adjustment, neonatal mortality was reduced by almost 30% for children of mothers who received malaria prophylaxis (OR 0.72, $p < 0.01$). Multivariate regression found that IFA supplementation for more than 90 days combined with malaria prophylaxis during pregnancy was the most favourable regimen – showing a weak yet significant ($p < 0.05$) correlation with height-for-age z-scores.

After adjustment, no significant relationship was observed for either iron supplementation alone or IFA supplementation during pregnancy and child stunting. Moreover, after adjustment, no significant relationship was observed for iron supplementation and neonatal mortality.

These findings run contrary to those from Asian settings, where IFA supplementation is significantly correlated with linear growth and reduced neonatal mortality. Considering that malaria remains endemic across many parts of Africa, it is possible that any positive effects from supplementation were overridden by malaria infection.

This paper is complex in nature with multiple regression models and outcomes being considered, each with seemingly contrasting findings. Nevertheless, two practical lessons can be taken from the findings:

First, malaria prophylaxis during pregnancy remains important for reducing infant stunting and neonatal mortality in malaria-endemic regions.

Second, combining malaria prophylaxis with IFA supplementation appears to be effective in increasing linear growth, but it is important for health systems and practitioners to consider the complex relationship between these two strategies.

Although the study had its limitations, steps were taken to minimise bias and a large sample size was used for this analysis, which increases the reliability of these results. The authors present both adjusted and unadjusted regression models and, due to the scope of this summary, we have only presented the adjusted findings. We encourage readers to review the original paper to see how these regression models were created and confounders accounted for.

A home-based nutritional intervention for preschool children: Evidence from India

This is a summary of the following paper: Ansuya B, Baby S, Unnikrishnan B et al. (2023) *Impact of a home-based nutritional intervention program on nutritional status of preschool children: A cluster randomized controlled trial*. *BMC Public Health*, 23, 51. <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-022-14900-4>

A community-based cluster randomised controlled trial design was used for this study in rural southwestern India. All 253 participants were aged 3–5 years, had moderate (weight-for-age < -2 to -3 standard deviations) or severe underweight (< -3 standard deviations), and mothers who were registered¹ centres. Control and intervention groups were randomised at a 1:1 ratio (see Box 1). Measurements were taken every month throughout the 12-month intervention period.

Both groups gained weight at a steady rate across the 12-month period – as expected – but the intervention groups' growth trajectory was steeper. Average weights within the intervention group remained higher and accelerated away from the control group at each measurement, concluding with an average weight difference of 0.82 kilograms between the groups ($p < 0.001$) at the end of the study. In the intervention group, the percentage of children moderately underweight reduced from 41.5% to 24% in 12 months, while severe underweight reduced from 8.6% to

3.16%. Only minimal changes were observed in the control group.

Cluster randomisation was valid for this setting. This method usually requires a larger sample size to see an effect – compared to individual randomisation, which is the gold standard – but in this case an appropriate sample size calculation was applied that also accounted for attrition. The researchers then enrolled slightly more children than needed, even though there was no dropout and zero mortality by study conclusion, so this study was appropriately powered.

The data are compelling and show a clear benefit of this intervention within this population. This trial would need to be expanded to a broader group to infer results about a larger population, but the methodology was robust, and the effect size was large – allowing us to be confident in these findings.

Although both arms of the study had comparable weights at baseline and most other characteristics did not differ significantly, more children in the intervention group were below the poverty

line (9.4%) than those in the control group (0.8%). Conversely, there were more middle-income households within the control group (23.8%) than the intervention group (15.7%). As weights were comparable, this difference may be insignificant. However, it is plausible that the lower socio-economic status group adhered more strictly to the intervention as they placed more value in it. By contrast, higher-income households may have seen this as less of a priority. This could affect our interpretation until further results from a wider study group are published.

Box 1 The intervention

The primary outcome of this study was to measure weight gain in participants. The intervention was a home-based health education and recipe demonstration session delivered by a single investigator. The session covered the preparation of 15 protein and iron-rich recipes and the risk factors and aetiology of malnutrition, among other things. Participants were then provided with a further educational resource so that mothers could read in more detail about malnutrition and its determinants after the session.

Mothers completed food diaries and took photos of recipe preparation to evidence adherence to the protocol.

¹ 'Anganwadi' is a type of rural childcare centre in India. They provide basic healthcare as part of the public health system through workers who are less qualified than doctors or nurses, but who live in communities and can provide local insight and necessary social skills to promote healthcare.

The 2023 Lancet series on 'small vulnerable newborns': A quick overview

This is a summary of the 2023 *Lancet* series: Small vulnerable newborns.

<https://www.thelancet.com/series/small-vulnerable-newborns>

The foundations of human wellbeing are laid before birth. Unfortunately, many babies experience adversities during this intrauterine period. Consequently, they can be born preterm (<37 weeks of gestation) or suffer foetal growth restriction and be born small for gestational age (SGA). Both preterm birth and foetal growth restriction can result in low birthweight (LBW, <2500g). Children who are born preterm, SGA, or with LBW have a markedly increased risk of stillbirth, neonatal death, and later childhood mortality. Additionally, these conditions are associated with multiple morbidities with short- and long-term adverse consequences, for newborns, their families, and society at large, resulting in a major loss of human and economic capital.

This *Lancet* series presents a new conceptual framework that brings preterm birth, SGA, and LBW together under the term "small vulnerable newborns" (SVN) and makes the call that prevention of preterm and SGA births is critical for global child health and for societal development.

The first paper (Ashorn et al, 2023) looks at the current situation, making the case for this new concept of an SVN, revisiting some of the definitions around vulnerability, and aiming to ensure these newborns are cared for better. The second paper (Lawn et al, 2023) depicts SVN epidemiology – the patterns of disease and where that disease may occur. The third paper (Hunter et al, 2023) looks at the biological mechanisms that underpin some of the SVN. For the fourth paper, Hofmeyr et al (2023) reviewed the literature to identify what interventions existed and came up with a list of eight interventions that could be used to reduce and mitigate the burden of SVN: multiple micronutrient supplementation, balanced protein and energy supplementation, low-dose aspirin, progesterone provided vaginally, education for smoking cessation, malaria prevention, treatment of asymptomatic bacteriuria, and treatment of syphilis. If fully implemented in 81 low- and middle-income countries, those preventive interventions could prevent 5.2 million SVN births and 0.6 million stillbirths every year.

In a final commentary, Mohiddin et al (2023) provide a call for action based on three pillars: making SVN prevention a priority, getting the proven interventions scaled up, used globally, and into existing guidelines, and finally improving measurement and accountability.

In response to this call for action, Marie McGrath, Emergency Nutrition Network's Technical Director and Co-Chair of the MAMI Global Network – and a familiar face as a former Editor of Field Exchange – responded with her views on the series from a MAMI perspective (page 5), in a must-read for contextualising this important piece of work.

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Intensified antenatal care nutrition interventions in Burkina Faso

This is a summary of the following paper: Kim S, Zagré R, Ouédraogo C et al (2023) *Intensified nutrition interventions in antenatal care services increased consumption of iron and folic acid supplements and early breastfeeding practices in Burkina Faso: Results of a cluster-randomized program evaluation. The Journal of Nutrition.* <https://doi.org/10.1016/j.tjnut.2023.06.016>

Despite improvements in the receipt of antenatal care (ANC) and iron and folic acid (IFA) supplements during pregnancy in Burkina Faso, evidence on the integration and quality of nutrition interventions in ANC services, as well as on the utilisation and impact of these services, remains limited.

From 2020 to 2021, Alive & Thrive supported the Government of Burkina Faso to strengthen the provision of IFA supplementation and interpersonal counselling delivered through ANC services and community-based contacts in two western regions – Boucle du Mouhoun and Hauts-Bassins. As part of the intensified nutrition intervention package, counselling emphasised the importance of early, and regular, ANC attendance, adequate food intake and dietary diversity, adherence to IFA supplementation, adequate weight gain, and early initiation and continuation of exclusive breastfeeding. Routine monitoring of weight gain was also implemented.

A cluster-randomised evaluation, with baseline (2019, N=2,880) and endline (2021, n=2,880)

cross-sectional surveys, was conducted with pregnant and recently delivered women to assess the impacts of intensified nutrition interventions during ANC (compared with standard ANC) on intervention coverage and maternal nutrition practices. Demographic and socio-economic characteristics were similar for women in the intervention and control areas, with an average age of 27 years. Most women were married and had experienced at least one previous pregnancy, over 60% had never attended school, and approximately 60% lived in food-secure households.

The evaluation findings showed improvements in coverage of ANC visits, with women in intervention areas being more likely to attend their first ANC visit during the first trimester and to attend at least four visits during their pregnancy. Impacts on coverage of community-based contacts were particularly notable: the proportion of women who experienced any home visits increased by 35% and those attending community meetings increased by 27%. In addition, more women in the intervention areas received nutrition counselling, had their weight measured more fre-

quently, and reported having sufficient IFA tablets during their pregnancy.

Impacts on women's behaviour were more mixed. Women in intervention areas consumed, on average, 21 more IFA tablets than women in control areas, although the percentage of women who consumed ≥180 IFA tablets during pregnancy remained low overall. There was no impact of the intensified nutrition intervention package on women's diets, with low dietary diversity observed for both intervention and control areas. However, there were significant impacts on early initiation of breastfeeding and exclusive breastfeeding in intervention areas.

Overall, this study provides a good example of how nutrition interventions can be strengthened within government-delivered ANC services, with particularly notable improvements in service coverage and nutrition counselling, as well as on adherence to IFA supplementation and breastfeeding practices. However, the lack of impact on women's dietary practices warrants attention. As highlighted by the authors, contextual factors such as levels of household food insecurity, social norms, and family support may be contributing and should be considered in future efforts to improve women's diets. Finally, while the authors confirm that the integration of the intensified nutrition intervention package into existing health systems and services was feasible, the scalability of such a model beyond the study context requires further investigation.

A descriptive analysis of gaps in nutrition services across multiple countries

This is a summary of the following paper: Ramadan M, Muthee T, Okara L et al. (2023) Existing gaps and missed opportunities in delivering quality nutrition services in primary healthcare: A descriptive analysis of patient experience and provider competence in 11 low-income and middle-income countries. *BMJ Open*, 13, 2, e064819. <https://pubmed.ncbi.nlm.nih.gov/36854587/>

This cross-sectional study analysed standardised, publicly available service provision assessments – comprehensive surveys that collect data from primary healthcare facilities – across 11 countries (Table 1). The secondary data analysis aimed to assess the competence of primary healthcare providers in delivering essential and preventative nutrition services and patients' experiences in receiving the recommended components of care. Patient experience was assessed through self-reported nutrition service awareness, while provider competence was assessed via direct observation during antenatal care and sick child visits.

To perform the analysis, all outcome variables associated with both patient experience and provider competence were coded as either 1 (available) or 0 (not available). These binary variables were then used to generate facility-level averages for analysis. Data were obtained for 18,644 antenatal care and 23,262 sick child visits across 8,458 facilities.

All but one country (Democratic Republic of Congo) reported patient experience scores below 50% and provider competence was below 50% in every country. Patient experiences with child nutrition services were found to be significantly poorer compared to maternal services.

Across all countries, less than 42% of clients reported that their child's weight and growth were discussed with them. In 10 of the 11 countries, only 40% of clients received appropriate fluid intake or breastfeeding counselling and less than 40% received solid food counselling during illness. The Democratic Republic of Congo was an exception, as 99% of clients reported being advised on both fluids and solids.

Although the patient experiences were generally poor across the board, most providers (>72%) explained how to take iron and folic acid at an antenatal care visit. Despite this, knowledge exchange regarding iron side effects was poor (<31%) across all countries, highlighting a lack of depth in nutrition consultation. In addition, in all countries with available data, less than 20% of observed providers advised on early breastfeeding practices. A full breakdown of results for separate indicators can be found in the original paper.

"There was evidence of a lack of depth in providers' assessment of the nutritional status of expectant mothers and children."

A limitation of the study is that data were taken from different time points across different

countries; therefore, although this provides an overall picture, it is difficult to compare the findings between countries as indicators change over time. Patient experience was also a self-reported measure, which lends itself to reporting bias, although this method has provided a large sample size to draw from, which is a positive.

Another important consideration is that the analysis was only conducted for primary facilities (n=6,248, 76% of the sample). This means that these results are only valid for community-based nutrition services. Most data were collected from rural settings.

Although measuring quality nutrition service data in the primary healthcare system remains challenging, this evidence highlights that services were lacking in the 11 assessed countries. There are significant opportunities for improvement.

Table 1 Service provision assessments included in the cross-sectional study

Country	Year
Afghanistan	2018
Democratic Republic of Congo	2018
Haiti	2017
Kenya	2010
Malawi	2013–2014
Namibia	2009
Nepal	2015
Rwanda	2007
Senegal	2018
Tanzania	2015
Uganda	2007

Ensuring that 'at-risk newborns' receive appropriate yet cost-effective care

This is a summary of the following paper: Narayanan I, Litch J, Srinivas G et al. (2023) *At-risk newborns: Overlooked in expansion from essential newborn care to small and sick newborn care in low- and middle-income countries*. *Global Health: Science and Practice*. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9972386/>

This position paper highlights the current state of care for newborns in low- and middle-income countries and argues for the introduction of a new category to reduce child mortality. Globally, great progress has been made over the last 20 years in reducing the under five years mortality rate by 58% and neonatal mortality by 51%. Yet both measures are a long way off the 2030 Sustainable Development Goals targets. This highlights a need to improve care for this group.

Identifying 'small and sick newborns' and providing targeted care to this group has proved to be an effective triage system so far. As well as concentrating treatment on the sickest children, this dichotomous model simultaneously allows low-risk children to remain with their mothers to encourage healthy bonding and breastfeeding practices – reducing the burden on healthcare systems that

consequently do not need to spend resources on monitoring the whole patient population.

"Newborn care in low- and middle-income countries has transitioned rather abruptly from essential newborn care for all newborns to a focus on special/intensive care for the small and sick baby without considering an intermediate group of at-risk newborns."

However, the authors argue that this system can be further divided with the introduction of an intermediate category, recognising that many children fall between the minimal physician care and intensive care levels on the spectrum. For this group, the authors cite findings from sub-Saharan Africa where keeping a closer eye on intermediate children reduces the risk of their deterioration.

The authors also point to findings from Uganda, Indonesia, and India – where the nurse-to-patient ratio ranged from 1:15 to 1:30 – and propose that an intermediate group would reduce this ratio as children requiring only minimal supervision could be seen outside of neonatal units.

In their proposal, the authors define this intermediate group as 'at-risk newborns', describing a neonate with increased risk of morbidity and/or mortality who is still maintaining homeostasis and does not require specialist or intensive care. This group still requires close monitoring, as their risk for deterioration is high, but the technology used can be basic and delivered through a practitioner with less formal training than a nurse.

It is logical that this would reduce the burden on the formal healthcare system, which could save both time and money. However, any changes would need to be balanced with the additional cost of training this intermediate layer. The authors note that this would still be cheaper than the dichotomous model, which again is logical, but rolling this out into practice would require additional data on cost and efficacy. There may also be some children lost to follow-up or incorrect referrals of children. As adapting a two-tiered system to the three-tiered model could create confusion for both patients and healthcare workers.



World Health Organization: Preventing and managing wasting and nutritional oedema in children under five years

This is a summary of the following guideline: *WHO (2023) WHO guideline on the prevention and management of wasting and nutritional oedema (acute malnutrition) in infants and children under 5 years.*

<https://www.childwasting.org/normative-guidance>



The World Health Organization (WHO) recently updated its guidelines on the management of acute malnutrition, building on and revising the previously published 2013 guidelines. The updated guidelines are divided into four sections: the management of infants under six months of age at risk of poor growth and development; the management of infants and children aged 6–59 months with wasting and/or nutritional oedema; post-exit interventions after recovery from wasting and/or nutritional oedema; and the prevention of wasting and/or nutritional oedema (with the later section on prevention to be published later in 2023).

The expanded scope of this guideline addresses some areas that were neglected in previous WHO guideline processes, including support to vulnerable infants, wherein the guidelines include regular health check-ups for infants before they reach the age of six months to

ensure that the needs of those infants who are not growing well are met before they meet the criteria for wasting and/or nutritional oedema as well as providing recommendations for moderately wasted children through both dietary and clinical approaches. This change means that health systems will have new tools to support children who fall into the category of 'high-risk moderate wasting.' The updated guideline also provides guidance on psychosocial elements of care for infants at risk of poor growth and development and infants and children with wasting and/or nutritional oedema, as well as their mothers/caregivers.

This new 2023 guideline includes 19 recommendations (12 new and seven updated) and 10 good practice statements. Guiding principles that were given strong consideration within all recommendations and good practice statements included: a) Taking a child health approach (i.e. putting the child's health, growth, and devel-

opment at the forefront); b) Caring for the mother/caregiver–infant pair (recognising the health and wellbeing of one is intimately linked to the other's); c) Focusing on multisectoral action, with the health system placed at the centre of interventions; d) Prioritising nutritious home foods to prevent wasting, manage moderate wasting, and support recovery from severe wasting; e) Recognising gender norms and power structures and focusing on enhancing gender equity; and f) Ensuring that implementation of recommendations is informed by local contexts.

As a next step within the guideline process, UNICEF and WHO have established a Technical Advisory Group. This group aims to assist in the implementation of the guidelines and to support national governments in adapting their national guidelines accordingly.

The key messages within the 2023 guideline can be found in Box 1.

Box 1 Key messages from the management section of the guideline

1. Nutritional status must not be seen in isolation and the assessment of an infant's or child's health is key for decision-making.
2. Mothers and their infants under six months who are at risk of poor growth and development must be identified early and cared for as an interdependent unit. Culturally appropriate and effective care of infants and their mothers is one of the most effective preventative actions of all.
3. Not all children with moderate wasting need a specifically formulated food to supplement their diet. Risk factors to prioritise which moderately wasted children to consider for specially formulated foods include high-risk contexts, such as humanitarian crises, as well as specific individual and social factors.
4. Children with severe wasting should receive nutritional treatment with ready-to-use therapeutic food. The amount of therapeutic food given can be either constant until anthropometric recovery has been achieved or reduced if it is safe and appropriate to do so.
5. Community health workers can manage children aged 6–59 months with acute malnutrition in the community if they are adequately trained and receive ongoing supervision and support.
6. Countries must be supported to adopt these recommendations, considering their specific context, needs, and capacities at national and sub-national levels.



Caregivers in Nara receiving MUAC training and bands. Nara, Mali.

© International Rescue Committee/2020

The state of food security and nutrition in the world 2023

This is a summary of the following report: *FAO, IFAD, UNICEF, WFP and WHO (2023) The State of Food Security and Nutrition in the World 2023. Urbanization, agrifood systems transformation and healthy diets across the rural–urban continuum. Rome, FAO.*

<https://doi.org/10.4060/cc3017en>



This densely packed, 316-page report provides a comprehensive breakdown of the food security landscape and subsequent nutrition indicators both globally and by region. We encourage readers to download and view elements of the report that are specific to their own work. A detailed summary of the findings is beyond the scope of this article; instead, the key messages are outlined (Box 1).

A central theme of the 2023 report is urbanisation. The report highlights the urban–rural divide that exists across stunting, wasting, and overweight globally¹ – with stunting and wasting disproportionately affecting rural populations and overweight impacting urban communities. This is true for all regions, although the effect is less pronounced for wasting in Latin America and the Caribbean, where the urban–rural divide is present but not significant.

By 2050, 70% of the global population are projected to reside in cities. Food systems require reorientation to cater to these new challenges and leverage opportunities to eradicate hunger, food insecurity, and malnutrition.

“As urbanisation increases, rural and urban areas are becoming more intertwined, and the spatial distinction between them is becoming more fluid.”

Another key theme is the context in which this report arrives – with global food security facing the stressors of the COVID-19 pandemic, including its subsequent economic fallout, and the war in Ukraine, with its trickle-down effects

¹ Global data are only provided for Africa, Asia, and Latin America and the Caribbean for these high-level indicators, with Europe, Oceania, and Northern America omitted. A more detailed breakdown of these trends can be found in the article below.

on food and energy affordability. These stressors exacerbate existing conflict, climate extremes, economic slowdowns and downturns, and growing inequality. These factors have all been highlighted in previous reports but are set to continue and, in some cases, intensify.

Estimates indicate that hunger is no longer on the rise but is still far above pre-COVID-19 pandemic levels and far off track to achieve Sustainable Development Goal 2 (Zero Hunger).

Box 1 Key findings

Global hunger levels stalled between 2021 and 2022, yet many places in the world face deepening food crises.

Access to nutritious, safe, and sufficient food remains an issue for roughly 2.4 billion individuals, particularly women and rural residents.

Child malnutrition remains high around the world – 22.3% of children are stunted, 6.8% are wasted, and 5.6% are overweight.

Urbanisation is accelerating and driving increased consumption of processed and convenience foods, leading to a spike in overweight and obesity rates.

Rural dependence on global markets is another concern, as previously self-sustaining rural regions are now increasingly reliant on broader markets for access to nutrients.



2023 Joint Malnutrition Estimates

This is a summary of the following report: *UNICEF, WHO and the World Bank (2023) Levels and trends in child malnutrition.*

https://data.unicef.org/resources/jme-report-2023/?utm_id=JME-2023

Every two years, joint estimates for child malnutrition (aged under five years) are updated to provide a more accurate picture of the magnitude of child malnutrition globally. The headline figures for 2023 – 148 million stunted, 45 million wasted, and 37 million overweight – indicate that not enough progress has been made on the global level.

Just one-third of countries are projected to halve the number of stunted children – as per the 2030 Sustainable Development Goals – and only one in every six countries is on track to meet the 3% prevalence of overweight targets. Globally, wasting prevalence is at 6.8%, which has changed little since 2000 (8.7%). Stunting progress has been more promising, with a 10.7% reduction in the same timeframe (down from 33.0% to 22.3%). However, stunting progress is tailing off, so efforts are needed to accelerate progress. Since 2000, overweight prevalence has steadily increased year on year.

Almost all stunted children reside in Asia (52%) and Africa (43%), although some countries in South and Central America and Oceania have

‘high’ or ‘very high’ prevalence. Although many regions are off track based on 2012–2022 trends, most are still making progress. Nonetheless, stunting prevalence is worsening in Melanesia (+3.1%) and has largely stalled in Middle Africa (-0.5%) and Southern Africa (-0.6%). Significant progress has been made in Southern Asia (-9.8%) and Eastern Africa (-8%) in particular, but stunting prevalence remains unacceptably

high (30.5% and 30.6%, respectively). This highlights that stunting rates can improve given the right policies, but that more effort is required.

Wasting prevalence varies widely within regions, but Asia and Africa are the continents with the most numerous ‘high’ prevalence countries (>10%). Around 32 million and 12 million wasted children reside in Asia and Africa, respectively, with Latin America and the Caribbean and Oceania (around 1 million) making up most of the rest. A total of 25.1 million wasted children live in Southern Asia – far exceeding any other region.

“Only 25% of children under five live in Southern Asia, but this sub-region is home to more than half of all children with wasting.”

By contrast, the prevalence of overweight children has declined in low-income countries (-1.7%), remained stable in lower-middle-income countries (+0.3%), and increased in upper-middle- (+1.6%) and high-income countries (+1.6%) since 2000. Australia and New Zealand (+6.9%) and Melanesia (+4.8%) showed the greatest increases in childhood overweight between 2012 and 2022.

There are data gaps in some regions that make it difficult to accurately assess progress toward global targets – particularly for wasting (Box 1). Yet current trends indicate that stunting reduction targets will be missed by some 39.6 million children. Over 80% of these ‘missed’ children are living in Africa.

Box 1 Methodology

The key dissemination materials for the 2023 edition include global, regional, and country trends from 2000–2022 for stunting and overweight. For wasting and severe wasting, country estimates are based on available primary data sources (e.g., household surveys), while global trends are presented for 2000–2022 and the regional estimates show the latest estimates (2022). Country progress assessments toward the 20230 targets are aggregated into regional summaries and included.

Flagging hunger hotspots

This is a summary of the following report: *WFP and FAO (2023) Hunger Hotspots: FAO–WFP early warnings on acute food insecurity, June 2023 to November 2023 outlook. Rome.*

<https://doi.org/10.4060/cc6206en>



In Kabul Province, hundreds wait outside a distribution centre to register for humanitarian aid. Afghanistan.

© WFP/Sadeq Naseri

The post-pandemic global economy is set to slow down in 2023, with various fiscal measures being implemented that will have knock-on effects throughout many communities. Domestic food prices remain high and low foreign currency reserves in many countries limit imports. Compounding this, there is reduced donor support to offset hunger in 2023, which will have negative programmatic implications.

Extreme weather events are also increasingly likely – a trend which has been seen across the last decade – with climate variability, droughts, floods, and storms (such as Cyclone Mocha, hitting Myanmar) expected. At the time of publication, El Niño conditions were projected to start from May to July 2023 (Box 1) – these have since been confirmed by the World Meteorological Organization.¹

The purpose of the report is to first flag vulnerable hotspots and, in turn, provide country-specific recommendations for anticipatory actions (short-term protective interventions) and emergency response (actions addressing existing humanitarian needs) to be

implemented. These interventions work to mitigate humanitarian needs during the critical time window between an early-warning trigger (as seen in the flagged countries) and an actual impact on livelihoods. The report also touches on some preparedness actions – which are critical for building resilience.

Hotspots are identified by food security, conflict, economic, and natural hazards expert consensus, based upon analysis from the Food and Agriculture Organization of the United Nations and World Food Programme – situated in Rome head offices and in country. Pre-set qualitative and quantitative indicators are applied, a breakdown of which is beyond the scope of this summary.

Acute food insecurity is projected to deteriorate further in 22 countries between June and November 2023. The situation in all featured countries is stark, but categorisation by severity (below) allows for the effective prioritisation of already constrained resources.

Highest concern – Urgent

Afghanistan (15.3 million in acute food inse-

curity), Burkina Faso (3.4), Haiti (4.9), Mali (1.3), Nigeria (24.8), Somalia (6.6), South Sudan (7.8), Sudan (19.1), and Yemen (16.9).

Severe movement restrictions are affecting people and goods in Haiti, Burkina Faso, Mali, and Sudan (amidst recent conflict). Except for Afghanistan, all countries in this ‘highest concern’ category have conflict/insecurity, which adds an additional challenge to food access and nutrition programming.

Very high concern – Intense and worsening

Central African Republic (3 million in acute food insecurity), Democratic Republic of Congo (24.5), Ethiopia (20.1), Kenya (5.4), Myanmar (15.2), Pakistan (8.6), and Syria (12.1).

Additional hunger hotspots

El Salvador (no data), Guatemala (3.2), Honduras (2.6), Lebanon (2.3), Malawi (3.8), and Nicaragua (no data).

¹ <https://public.wmo.int/en/media/press-release/world-meteorological-organization-declares-onset-of-el-ni%C3%B1o-conditions>

Box 1 What is El Niño?

El Niño is a natural climate phenomenon that results in warmer temperatures in the Pacific Ocean. Warmer water spreads further and stays closer to the surface, which releases more heat into the atmosphere. El Niño has been shown to increase the likelihood and intensity of droughts, floods, crop failures, and subsequent food shortages in certain regions. However, climate forecasting is complex and unpredictable, so exact weather predictions are challenging.

The climate crisis unfolding in the Horn of Africa. Women and children are displaced by severe drought. Ethiopia.



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Cover

Front: A mother and child, Yobe
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Onafuwa

Back: A cross section of participants
and facilitator during a FTFSG session
in Ngala, Borno State, Nigeria 2022.
Idris Usman Shall/FHI 360

About ENN

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

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

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

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