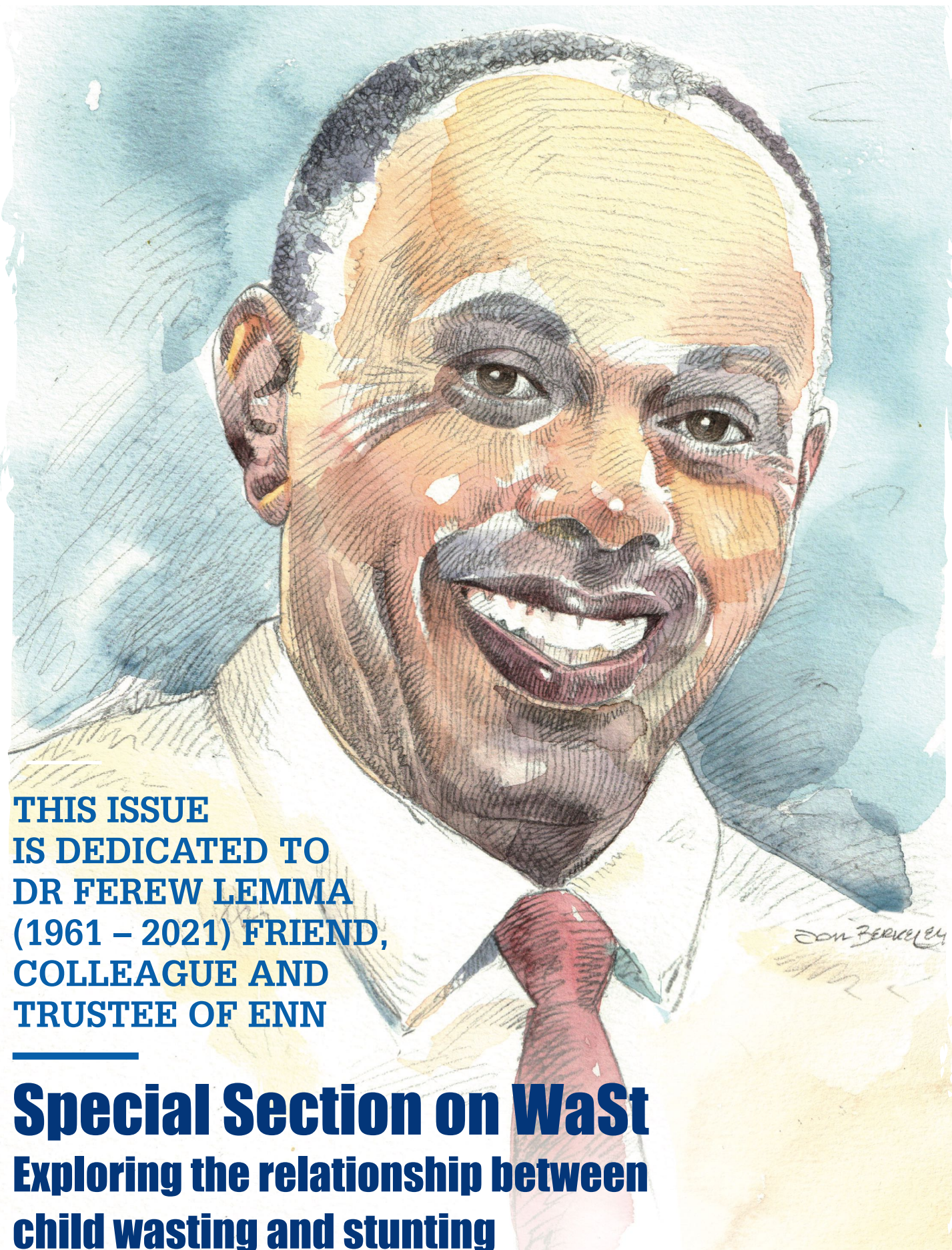


Field Exchange

APRIL 2022 ISSUE 67

Emergency Nutrition Network



**THIS ISSUE
IS DEDICATED TO
DR FEREW LEMMA
(1961 – 2021) FRIEND,
COLLEAGUE AND
TRUSTEE OF ENN**

Special Section on WaSt
Exploring the relationship between
child wasting and stunting

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Dear readers,

Welcome to the 67th edition of Field Exchange which we are excited to announce includes a special subsection on the relationships between wasting and stunting (WaSt) featuring an insightful collection of content with its own dedicated editorial (page 49) by members of the Wasting and Stunting Technical Interest Group (WaSt TIG). It is the fruit of a collaboration with the WaSt TIG, an established collective coordinated by ENN since 2014, that comprises experts in the fields of child growth, health, nutrition and epidemiology from the research, policy and programme arenas. In the subsection you will find 14 pieces (spanning country examples, views pieces, research summaries and snapshots) that add to our understanding of the often complex associations between wasting and stunting and what this means for policy and programming. In their reflections, the WaSt TIG note a relative lack of WaSt programming examples at country level. This perhaps reflects that while there has been immense progress in generating evidence for and heightening awareness of the need to address wasting and stunting together, concerted effort is now needed to figure out how to enable this and how to do this in practice. We encourage you to share experiences and developments with us in this space, however small or inconsequential you may think they are (they are not).

Moving onto the rest of issue, this edition features a rich set of contributions with some key themes featuring throughout this diverse collection. One such theme is the importance of data and information systems. Health management information systems are a critical source of routine nutrition data that can provide sub-national data more frequently than national household surveys. However, their use is not without challenges, as highlighted by Abduwahab et al who share their experiences of using routine data to develop the Nigeria Nutrition scorecard (page 26) and provide recommendations for the improvement in the quality of routine data. Kureishy et al (page 33) also describe the use of data in the development of a nutrition hotspot analysis tool. Again, although challenges persist, the development and use of this scoring tool is improving nutrition surveillance and the prioritisation of interventions in six Sahelian countries.

Also on the theme of data and assessment, we feature three articles on Link NCAs (Nutrition Causal Analysis) from different contexts. An article from Somalia (page 53) on a study of risk factors for wasting and stunting found that risk factors are context-specific, with some that overlap between the two forms of undernutrition but not consistently so. They conclude that incorporating community perspectives to further understand the underlying context and to develop more appropriate programme priorities is critical. This is echoed in an article that analysed all Link NCA studies carried out in Africa (page 79) to identify



Checking for bilateral pitting oedema at Camp 8W Integrated Nutrition Facility, Cox's Bazar, Bangladesh

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the extent wasting could be explained by the underlying causes of malnutrition and/or contextual factors. This synthesis revealed that wasting prevalence was not associated with many commonly used indicators of governance, crises and food security. The authors suggested placing more attention on improving methodologies to gain an understanding of the context-specific risk factors rather than trying to aggregate the data at a higher level in order to predict risk factors. These two articles therefore document the importance of listening to community voices to better understand and account for context in programming approaches.

However, an article by Fabregat et al (page 17) based on the analysis of more than 40 Link NCAs studies to date, found that while the Link NCA methodology adopts a participatory approach, more than half of the studies did not incorporate community recommendations and/or did not highlight these within the main report narrative (e.g., they were recorded in annexes). Furthermore, community perspectives often differed to the recommendations made by the analysts. This illustrates a paradox between what is a participatory approach alongside, as yet, a limited incorporation of these community perspectives within emerging programming actions. These findings highlight the need to unpack what 'participation' really means in practice, not only for Link NCAs but more broadly; participation needs to adopt a true commitment to listen to people, reflect thoroughly on what is being said including what might be uncomfortable or challenging to hear. It is to these communities that we are ultimately accountable and we have so much to learn from them on how programmes can best be adapted to local needs and opportunities.

We feature several articles from India in this issue sharing important initiatives towards more effective management of wasting including at community level. The first (page 6) shares headlines from a national consultation on acute malnutrition which demonstrates the high priority given to management at government level, examples of strong leadership, progress being made in generating evidence and the encouraging improvement

in case prevention and management across states. A second (page 88) article summarises the findings of an analysis of the burden of wasting and its associated risk factors among children under five in India. This analysis found an overall high prevalence of wasting, with the highest burden of wasting and severe wasting occurring in the first six months of life compared to older age groups. In line with other studies, the factors associated with wasting included lower maternal education, maternal underweight, Caesarean section, low birthweight and being a male child. Both reports highlight the need to intensify efforts around strengthening the prevention and management of growth faltering in infants under six months of age, alongside active growth monitoring activities for the early identification and timely management of children with wasting, all supported with stronger coordination, capacity building, regular monitoring and by adopting a multi-sector approach. The importance of pregnancy and pre-pregnancy interventions to reduce the high burden of wasting was also strongly emphasised.

A research snapshot (page 77) outlines the protocol for a study looking at the effectiveness of locally produced, nutrient-dense food supplements with different energy densities and nutrient compositions in different Indian states rolling out community-based management of wasting services. It is hoped that this study will contribute to the evidence on effective strategies to manage children with uncomplicated severe wasting in India.

Also from India, we draw readers' attention to a case study (page 43) of three COVID-19 positive children presenting with generalised oedema but without other signs of malnutrition whose oedema appeared to resolve with therapeutic feeding (F75). A postscript to this article highlights that as the understanding of preventive and therapeutic interventions to manage kwashiorkor evolves, it is helpful to observe that mechanisms in kwashiorkor have much in common with the phenomena of oedema associated with other conditions. It would be interesting to hear from readers if similar cases have been seen across other programmes.

Content featured from the Global Nutrition Cluster (GNC) highlights new online resources

including the GNC mentoring programme, GNC Learn, and various online tools and guidance to support emergency preparedness. The experiences of the first GNC Technical Alliance support to a local NGO in Somalia (ARDI) highlights a situation true of many local NGOs that not only have technical needs but also seek support on programme management, financial management and resource mobilisation. The Alliance is looking at forging links with other entities who have the expertise to provide such support.

Whilst a strong focus of Field Exchange content is (quite rightly) on community-level prevention and treatment of wasting, in this edition we feature a field article from Zimbabwe by Austin et al (page 30) that highlights the effectiveness of establishing a specialist multidisciplinary unit for the inpatient treatment of complicated wasting, dramatically bringing mortality rates down from nearly 46% to 14% in these vulnerable children. The article describes the journey of the Sally Mugabe Children's Hospital, Zimbabwe in its quest to improve the quality of care for wasted children by becoming a National Centre of Excellence for wasting management, providing valuable lessons for others embarking on the same goal.

Another article from the field by Rahimov et al (page 22) describes an often discussed but less often implemented approach of nutrition service rationalisation to tackle an important issue of duplication, double counting and gaps in service provision by multiple partners in Cox's Bazar, Bangladesh. The article highlights how bringing integrated nutrition services together under one roof for a 'one stop shop' improved programme coverage and service quality for Rohingya refugees after one year. Such an exercise was, of course, not entirely straightforward but resulted in extremely important benefits including a more streamlined approach that supported the continuation of services during the COVID-19 pandemic. A more comprehensive evaluation, including qualitative aspects is planned, the results of which will be featured in a future issue.

Finally, two recent reports from UNICEF/WHO describe the impact of the harmful marketing practices of the food industry on the health and nutrition of infants, children and women. A views piece (page 20) by Desplats draws on these two recent reports that highlight the scale and tactics of the food industry in the promotion of breastmilk substitutes and foods that contribute to unhealthy

diets and the need to strengthen efforts to protect infants, children and their mothers from harmful marketing practices. One shocking statistic revealed is that the formula milk industry spends more in one year on marketing than the entire two-year operations budget of the World Health Organization. In the face of the industry's ever more pervasive and persuasive tactics, we, as public health professionals, all need to act in more strategic ways to ensure women are supported to choose how to feed their infants and children based on informed choice and free from commercial influence.

There you have it – happy reading and please do continue to share your reactions and experiences with us. And just to whet your appetite for what's coming, we are planning a special Field Exchange series (online, print and podcasts) on complementary feeding in emergencies this year in collaboration with UNICEF. We'll be issuing a call for content soon – watch this space.

Marie McGrath (*Editor*)

Nicki Connell (*Editor*)

Anne Bush (*Editor*)

Philip James (*Editor*)

Dr Ferew Lemma 1961 - 2021



Dr Ferew Lemma, friend, colleague and ENN Board of Trustees member, died unexpectedly on Christmas Day. This is a huge loss for his family and friends, for Ethiopia and for the global nutrition community.

Dr Ferew was a public health physician with a PhD in Public Health Nutrition from the London School of Hygiene and Tropical Medicine. He had a long and illustrious career working in various capacities in higher education teaching/learning, health service delivery and management as well as research. He started his career with government service in the Regional Health Bureau and as a faculty member of Jimma University School of Public Health before moving to the UK in 1998 to study for his PhD. Upon its completion, he worked at London's South Bank University for eight years as a Senior Research Fellow then relocated back to Ethiopia in 2010 to act as Senior Nutrition Advisor to the Minister for Health, including serving as an advisor to the (former) First Lady of Ethiopia. As testament to how much he was respected on the international stage, he also occupied many important advisory positions such as being a member of the Independent Expert Group of the Global Nutrition Report.

ENN's partnership with Dr Ferew started in 2010 as we embarked on the year-long process of organising the CMAM conference in Addis Ababa, held in November 2011. The aim of this conference was to provide the space for government voices and experience to be front and centre – something that had not been done in previous international CMAM meetings. Dr

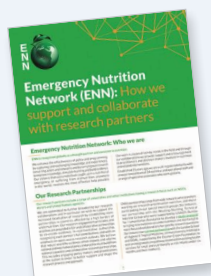
Ferew immediately saw the potential and became our key partner – helping us to navigate all the many hurdles we needed to jump to deliver this large, reputation-making event and he was integral to its success. His blend of knowledge and experience, spanning both the Ethiopian and the global context, meant that he instinctively understood what the crucial elements to success were, who it was critical to engage with and how to navigate the many different organisations, agendas and priorities. Among his many other duties he continued to be closely involved in the rollout of CMAM in Ethiopia where millions of severely wasted children have been successfully treated over the past decade, more about which can be read here.

Dr Ferew continued to be a great friend to ENN and we were thrilled when he agreed to join our Board of Trustees just over a year ago. He brought depth and gravitas to the position, along with the much-needed country-level perspective. He was always so willing to help us – our 'go-to' person for anything – no matter the subject, always the first person that we thought to ask. For all his immense experience and knowledge, no question or topic was ever too small for him; a truly humble giant of nutrition. He was proud to be associated with ENN and we can safely say that our growth over the past decade has in no small part been due to his substantial contributions.

What a privilege it has been to have his support and friendship. We send our deepest condolences to his family. May he rest in peace.

Emily Mates (*ENN Technical Director*)

ENN's Research Partner Brief



In February 2022, ENN published a short brochure highlighting the ways in which the organisation provides support and collaborates with its research partners. Being recognised globally as a thought partner and convener in nutrition, ENN prioritises evidence-based research that drives practical solutions for people working in nutritional emergencies. It is looking for more research partners to become involved. The full Research Partner Brief can be found online at <https://www.ennonline.net/researchpartners>

ENN's research engagement principles and practices are grounded in fair and collaborative partnerships to co-create evidence, recognising each partner's full contributions, with an emphasis on open access research outputs. ENN believes that robust scientific evidence which impacts and informs national and international policy and practice must build from national capacities and collaborative research partnerships. To this end, ENN is looking forward to developing a more diverse portfolio of research partnerships to continue the important work of capturing and sharing evidence that can lead to improvements in policy and practice.

The Research Partner Brief provides a quick overview of the current types of research partnerships in place, how ENN supports partners across the research cycle, the technical specialisms that ENN has to offer, highlights from ENN's publication library, how ENN supports research dissemination, an overview of ENN's impact in the research space and finally, a call for more people to collaborate on ENN's work. The brief emphasises how the organisation is committed to further broadening its research collaborations and, in particular, how it wishes to support the increased localisation of research by establishing more partnerships in those countries affected by a high burden of undernutrition.

Nutrition for Growth Summit 2021

The Tokyo Nutrition for Growth (N4G) Summit was held in December 2021 under the leadership of the Government of Japan. It was the third global pledging moment, designed to drive greater action toward ending malnutrition and helping ensure everyone, everywhere can reach their full potential.

This summit came at a critical time, midway through the United Nations (UN) Decade of Action on Nutrition, with only five years remaining to achieve the World Health Assembly targets on maternal, infant and young child nutrition, and 10 years to reach the Sustainable Development Goals.

The N4G Summit marked the culmination of the N4G Year of Action on nutrition launched in December 2020 by the Governments of Canada and Bangladesh. Guided by the N4G vision and roadmap¹, commitment-making was at the heart of the summit and over the course of the Year of Action governments, business, multilaterals, donors, and other development partners were encouraged to make data-driven financial, policy, programmatic, or impact commitments covering one or more of three focus areas:

1. Health: Integrating nutrition into Universal Health Coverage
2. Food: Transforming food systems, to promote safe, sustainable, and healthy diets (with important linkages to the UN Food Systems Summit held in July 2021).
3. Resilience: Addressing malnutrition effectively in fragile and conflict-affected contexts.

The promotion of data-driven accountability and securing new investment and driving innovation in nutrition financing cut across the above core areas.

By the conclusion of the summit, 396 new nutrition commitments (programmatic, policy and financial) were pledged by a total of 181 stakeholders from 78 countries. Importantly, two countries with high burdens of malnutrition, Bangladesh and Indonesia, pledged to step up domestic programming and double down on policies to reduce malnutrition. Donor governments, bilateral and multilateral development partners, civil society and other organisations committed new nutrition-specific and nutrition-sensitive financing of over USD 27 billion to tackle malnutrition in all its forms.

Future accountability for all the N4G commitments lies in the newly launched Nutrition Accountability Framework managed by the Global Nutrition Report (GNR). This is designed to record the new commitments made, monitor their impact and sets out the requirements for SMART commitment formulation (Specific, Measurable, Achievable, Relevant, Time-bound). Stakeholders are expected to report on their progress annually to the GNR.

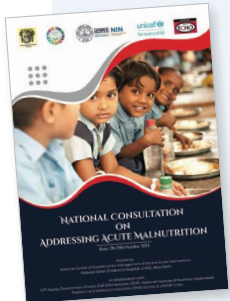
As well as the pledging summit itself, a large number of side events were held on a wide range of topics including nutrition financing, data gaps and data systems, the Global Action Plan on Child wasting² and food systems. This sharing of evidence and the highlighting of opportunities has paved the way for the next N4G summit, to be hosted by France in Paris in 2024, where it is hoped that tangible results can be observed from the robust commitments made in Tokyo.

¹ https://nutritionforgrowth.org/wp-content/uploads/2021/04/Vision_Roadmap_4.6.2021.pdf
² <https://www.childwasting.org/>



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National consultation on addressing acute malnutrition in India



Acute malnutrition in children under five years of age remains a public health concern in India with little progress made towards reducing the prevalence of severe acute malnutrition (SAM) over recent decades. This situation has been exacerbated by the COVID-19 pandemic as a result of disrupted livelihoods and increased food insecurity, reduced access to health and nutrition services and delays in the supply of food and medicines as well as the deployment of field workers.

The Government of India has been implementing guidelines for the facility-based management of SAM in children under five years of age since 2011. Many states now also provide community-based management of acute malnutrition (CMAM) for infants and children 6-59 months of age. The National Centre of Excellence for Management of Severe Acute Malnutrition (NCoE-SAM) has worked with the Ministry of Health and Family Welfare, UNICEF and state governments to strengthen care for children with SAM. Towards this end, a two-day 'National consultation on addressing acute malnutrition' was held by NCoE-SAM in October 2021 in collaboration with key actors, namely the National Institution for Transforming India 'Aayog' (commission), the Government of India, the Centre of Excellence for Management of Severe Acute Malnutrition Network, the Indian Council of Medical Research, the National Institute of Nutrition, Hyderabad, the Pediatric and Adolescent Nutrition Society and UNICEF India. The aim of the consultation was to share experiences from different states and gather recommendations from government representatives and experts.

Presentations and technical sessions during the consultation demonstrated the progress made in SAM prevention and management but also highlighted the need to strengthen existing services through better interdepartmental coordination, continuous training and regular monitoring. Key recommendations from the consultation focused on: (1) intensifying efforts towards the prevention and management of acute malnutrition in infants under six months of age; (2) strengthening growth monitoring and promotion activities for the early identification and timely management of children with SAM; (3) capacity building on CMAM; (4) providing appropriate complementary foods to infants and young children, including those with SAM; (5) scaling up the CMAM programme, targeting high burden areas and ensuring that monitoring platforms are in place; and (6) adopting a multi-sector approach that prioritises the prevention of childhood malnutrition by addressing its various underlying causes.



Health workers reviewing growth monitoring records



Piloting the e-learning platform

Global Nutrition Cluster e-learning platform



The Global Nutrition Cluster's (GNC) online learning platform provides access to e-learning modules related to nutrition cluster coordination (CC) and information management (IM). The development of the e-learning platform began in 2019 to address the needs and constraints identified in the GNC capacity building approach, namely the high demands for capacity development and strengthening across coordination teams and cluster partners supported by the GNC and a need to revise the face-to-face learning approach.

A pilot of the e-learning platform was launched during a webinar held by the GNC in October 2021. The event outlined the features of the platform and the types of content available. GNC Nutrition Cluster Coordinators and Information Management Officers were invited to participate in the pilot between October and November 2021 during which they would provide feedback on the platform's content and functionality while supporting their own professional development and contributing to shaping the GNC learning platform. Feedback from the pilot has since been incorporated into the platform, facilitating its public launch in April 2022.

The CC modules aim to strengthen capacity in nutrition CC and are targeted at individuals and organisations interested in coordinating a nutrition response in a humanitarian context. The IM modules aim to strengthen the capacity of individuals and organisations interested in managing information for a nutrition response in a humanitarian context. In both cases, the e-learning modules are organised into six functional competencies as described in the CC and IM Competency Frameworks. Learners are able to select the modules they wish to take across three levels (introductory, intermediary and advanced) based on their interests and professional development goals. All modules are open access and currently available in English, French and Spanish.

More information on the e-learning pilot launch is available at: <https://www.nutritioncluster.net/node/28541> and the GNC's online learning portal can be accessed at: <https://agora.unicef.org/totara/dashboard/index.php?id=19>

Infant and young child feeding in emergencies infographic series

In 2021, the Infant Feeding in Emergencies (IFE) Core Group published the Infant and Young Child Feeding in Emergencies (IYCF-E) infographic series. The infographics are based on the Operational Guidance on IFE (OG-IFE) and aim to assist in implementing specific actions and recommendations within the guidance. To date, six infographics have been produced and translated into multiple languages.

The first infographic helps to assist in the implementation of action 5.7 of the OG-IFE – protect, promote and support the early initiation of exclusive breastfeeding in all newborn infants. The infographic provides a guide for maternity service providers on supporting the early initiation of breastfeeding in emergencies and is available in English and French. The infographic includes key conversations and actions to take during pregnancy, immediately after birth, within the first hour after birth, on day one and at discharge.

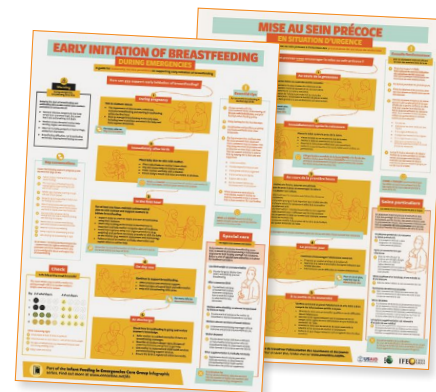
The second, third and fourth infographics help to assist the implementation of action six of the OG-IFE – minimise the risk of artificial feeding. The second infographic provides a guide on preventing and managing inappropriate donations of breast milk substitutes (BMS) and other prohibited products for emergency relief staff, donors and governments and is available in English, French, Spanish and Japanese. This infographic

includes key information on the risks associated with inappropriate donations and the key actions to prevent, detect and manage these donations.

The third infographic provides a guide on planning and managing artificial feeding interventions during emergencies for decision-makers and programmers working in emergency preparedness and response. The infographic is available in English and provides guidance on assessing the need for artificial feeding, designing and planning an artificial feeding management programme, securing the required supplies and services and implementing artificial feeding support.

The fourth infographic provides guidance for frontline workers, including health, nutrition and child protection staff, on supporting infants dependent on artificial feeding during emergencies. The infographic is available in English and provides guidance on the following topics: checking infants' eligibility for BMS support, determining if BMS can be used hygienically at home, discreetly providing BMS and supplies, counselling demonstrating how to feed infants as safely as possible, continued support and follow up procedures.

The fifth and sixth infographics help to assist the implementation of action 5.4 of the OG-IFE – anticipate and assess the impact of human and animal infectious disease outbreaks on



infant and young child feeding and take actions to mitigate the risks. The fifth infographic outlines the key considerations when making recommendations for infant feeding during infectious disease outbreaks and is aimed at national health authorities, health and nutrition policymakers, professional associations and other bodies and practitioners working in outbreak preparedness and response. The infographic is available in English, French, Spanish and Arabic. The sixth infographic is aimed at programmers working in emergency preparedness and response and provides information on how to anticipate the impacts of an outbreak on infant feeding and outlines the key actions to mitigate the risks. The infographic is available in English, French, Spanish and Arabic.

The IYCF-E infographics series is available online at: <https://www.enonline.net/ifecoregroupinfographicseries>

¹ <https://www.enonline.net/breastfeedingcounsellinginemergencies>

Food Systems Summit



**UNITED NATIONS
FOOD SYSTEMS
SUMMIT 2021**

The United Nations (UN) Food Systems Summit was held virtually during the UN General Assembly in New York on 23 September 2021. Recognising that too many of the world's food systems are fragile, failing and in need of reform, the summit aimed to accelerate food systems transformation to deliver safe affordable nutrition for all by bringing together key players from the worlds of science, business, policy, healthcare and academia as well as farmers, indigenous people, youth organisations, consumer groups and environmental activists. A key message underpinning the summit was that healthier, more sustainable and equitable food systems are crucial to achieving the 17 Sustain-

able Development Goals through the interconnectedness of food systems to face many global challenges such as hunger, climate change, poverty and inequality.

The summit itself was the culmination of 18 months of preparatory work conducted within the five Action Tracks that were established: 1) Ensure access to safe and nutritious foods for all, 2) Shift to sustainable consumption patterns, 3) Boost nature-positive production, 4) Advance equitable livelihoods and 5) Build resilience to vulnerabilities, shocks and stresses. Through a series of National Food Systems Summit Dialogues, Member States were supported to develop National Pathways for Food Systems Transformation that outlined clear visions of what governments, together with different stakeholders, expect of food systems by 2030. A Food Systems Champions Network was mobilised to support the generation of ideas, actions and sharing of information.

Importantly, the summit aimed to be a 'people's summit' seeking to engage people from all walks of life as 'food means something

to everyone, and we all need to do our part'. In support of this, a digital Food Systems Community platform and Food Systems Hero platform have been created that outline the practical ways that people can act for better food systems moving forward e.g., hosting 'Sustainable Sundays' – a gathering with friends and family for a healthy climate-friendly meal each week.

Following the summit, country-led and individual commitments to action around the five focus areas have been consolidated in a Commitment Registry. Further follow up and review mechanisms for accountability will be established.

A Joint Statement by the UN Secretary General was released highlighting the complementary agendas of the UN Food Systems Summit and the Tokyo Nutrition for Growth Summit held in December 2021. The statement outlines how the two summits are 'working collaboratively to advance solutions across systems with a mutual recognition that malnutrition in all its forms is one of the biggest challenges we face to ensuring optimal health, resilience, and prosperity for all.'

Healthy Mothers Healthy Babies 2021 Annual Report



At the start of 2021, the Healthy Mothers Healthy Babies (HMHB) Consortium launched its first ever annual report. The 2021 Annual Report¹ highlights the key achievements of the HMHB Consortium, elevating its mission to improve maternal nutrition and health through multiple micronutrient supplementation (MMS) throughout the 2021 Year of Action on Nutrition.

The inclusion of MMS in the World Health Organization's Essential Medicines List (EML) in 2021 was a significant step forward in accelerating the availability of MMS during pregnancy for millions of women in low- and middle-income countries. The HMHB Consortium developed an Advocacy Brief and Frequently Asked Questions document² to enable countries to include MMS in their national EMLs.

Furthermore, the HMHB Consortium offers easy access to over 100 key resources such as scientific articles, implementation tools and short expert videos on MMS and maternal nutrition through its 'Knowledge Hub'³ and provides an interactive MMS world map⁴ showcasing who does what in MMS-related activities worldwide.

Building on the momentum and groundwork of 2021, the HMHB Consortium looks forward to increasing its focus and support at the national level. More specifically, the HMHB Consortium plans to collaborate with ENN to explore the use of MMS in emergency and humanitarian settings and to understand the lessons learned and barriers to scaling MMS.

¹ <https://hmhbconsortium.org/read-the-first-hmhb-annual-report-2021/>

² <https://hmhbconsortium.org/knowledge-hub/faq-and-advocacy-brief-for-inclusion-of-mms-into-the-whos-model-list-of-essential-medicines/>

³ <https://hmhbconsortium.org/knowledge-hub/>

⁴ <https://hmhbconsortium.org/world-map/>

SIMPLIFIED APPROACHES

Simplified approaches website

Wasted children are up to 11 times more likely to die than those who are well nourished and currently treatment services only reach a third of children in need. Simplified approaches refer to a number of simplifications to existing national and global protocols for wasting treatment. These aim to improve the effectiveness, quality and coverage of treatment for child wasting while also reducing costs. The most commonly implemented and researched simplifications are provided in Box 1.

Box 1 Common simplifications for the treatment of child wasting

- Family mid-upper arm circumference (MUAC): training and equipping caregivers to screen their children for malnutrition by MUAC and the identification of oedematous malnutrition
- Community health worker (CHW)-led treatment: enabling and empowering CHWs to treat uncomplicated cases of wasting in the community
- Reduced frequency of follow-up visits: reducing the frequency of follow-up visits for admitted children from weekly to biweekly or monthly
- MUAC and/or oedema only: using MUAC and/or oedema as the only criteria for admission and discharge
- Expanded admission criteria: increasing the MUAC cut-off to admit all children <125 mm (or another agreed cut-off)
- Use of a single treatment product: treating all uncomplicated wasting cases with one product; i.e., ready-to-use therapeutic food (RUTF), despite the severity of wasting
- Reduced dosage: reducing the dosage of treatment product used

Multiple modifications are often used together in a 'simplified' or 'combined' protocol. This enables the harmonisation and simplification of services into a single approach, making services easier to implement while maintaining quality standards.

The simplified approaches website was developed by UNICEF in collaboration with partners from the Simplified Approaches Working Group. This global working group was established in 2020, bringing together child health and nutrition organisations and agencies to support the use of simplified approaches in response to the COVID-19 pandemic. The website provides a platform to share tools and resources to support the implementation and scale-up of simplified approaches.

As part of the website, the simplified approaches dashboard contains information on where simplifications are being implemented in order to improve coordination, maximise the potential for learning and support the translation of evidence to action. Information on the 52 countries currently engaged in implementing simplified approaches, alongside related publications, can be filtered according to the type of simplified approach or the region of implementation. Users can also contact the website directly to add relevant information to the dashboard. Other reports, studies and tools are also available, including quick guidance documents, reviews of evidence and planning and implementation tools.

The website can be accessed at:
<https://www.simplifiedapproaches.org/>



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A nutrition lab during a mission to prepare the East Africa Nutrition Sciences Institute (EANSI), Burundi, 2018

© Maimouna Diop Ly



Leveraging the 'Banking on Nutrition' partnership initiative in Africa

This article describes how an ongoing nutrition-smart programming approach was employed by the African Development Bank and harnessed as part of its COVID-19 response intervention



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AFRICAN DEVELOPMENT BANK GROUP



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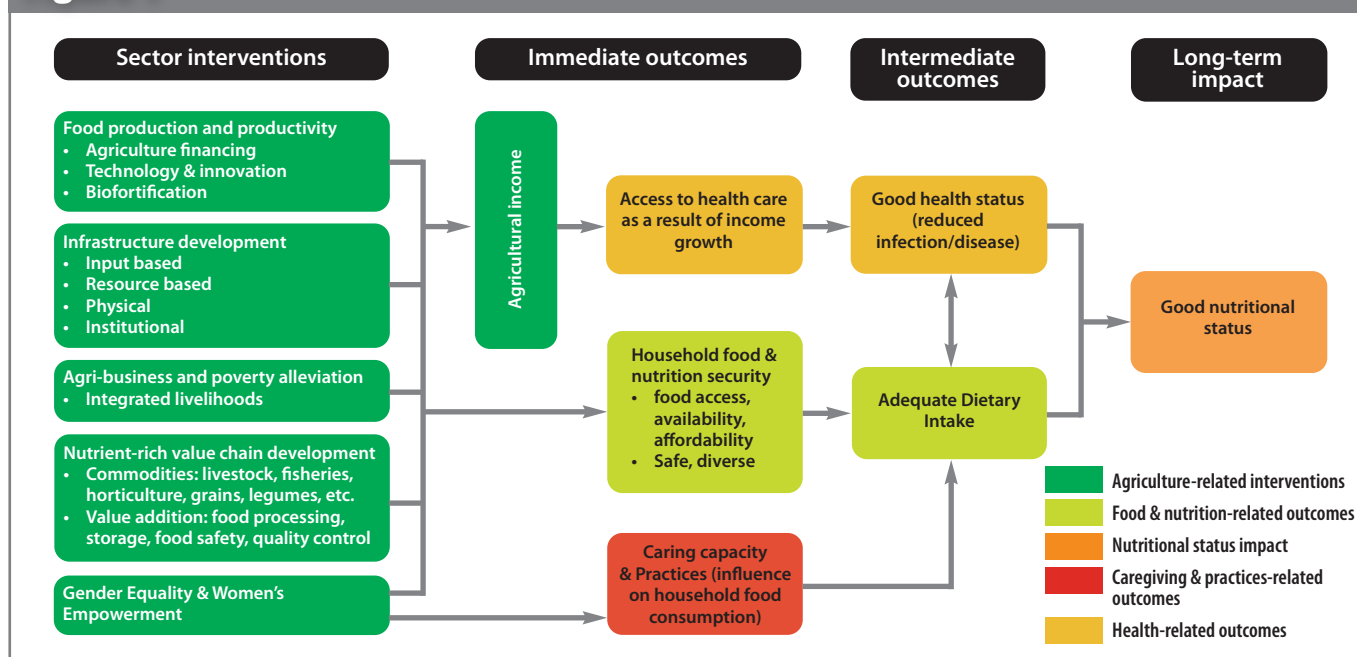
Key messages:

- The Banking on Nutrition partnership initiative – conceived as a means of ensuring food and nutrition security, addressing stunting and to unlock Africa's human potential – was effectively leveraged to tackle the pressing issues brought about by the COVID-19 pandemic.
- The COVID-19 pandemic has posed a significant threat to health and nutrition security at global, regional and national levels requiring emergency and sustained actions.
- Governments need to leverage the available resources to address the knock-on effects of the COVID-19 pandemic including nutrition-focused initiatives to safeguard public health and nutrition.
- Partnership engagement towards the operationalisation of multi-sector nutrition action plans is a critical driver for nutrition impact in Africa.

Introduction

The African Union has declared 2022 as 'The Year of Nutrition' necessitated by the need to preserve the gains in addressing malnutrition following the emergence of the COVID-19 pandemic that "exposed the economic vulnerability of African countries, as well as the weaknesses of the health and food systems" (African Union, 2022). The COVID-19 pandemic has posed a significant threat to global, regional and national nutrition security due to the paralysis of many sectors including economic, health, education and agriculture. The short-term impacts of COVID-19 include disruptions to the food

environment, reducing both access to and consumption of safe, nutritious and affordable diets. Food supply chains are affected by movement restrictions, social distancing, non-essential business closures and partial and/or total lockdown measures. Consequently, all available evidence points towards a probable loss of past gains achieved on food and nutrition security. The 2021 State of Food Security and Nutrition in the World report (FAO, 2021) estimated that the increase of world hunger, from 8.4% in 2019 to 9.9% in 2020, was predominantly attributed to the COVID-19 pandemic. More than a third of the world's undernourished

Figure 1 Example of an impact pathway for the nutrition-smart agriculture projects

population currently live in Africa (FAO, 2021). The long-term impact of the pandemic is projected to increase the prevalence of under- and overnutrition, making it even more challenging to achieve the Zero Hunger sustainable development goal (SDG) target by 2030 (Global Nutrition Report, 2021).

From an economic standpoint, the International Monetary Fund (2020) reported a downward trend in global economic prospects with emerging markets and developing countries anticipated to experience a protracted economic depression, exacerbating the 1.6% projected economic decline resulting from COVID-19 in 2020 and 2021. At the regional level, the forecasts of the African Development Bank (ADB/the Bank) indicate a fall in Africa's gross domestic product, with subsequent economic development predicted to drop by USD22.1 – USD88.3 billion (ADB, 2020). These reported economic predictions have generated growing concerns on food and nutrition security, particularly as it relates to marginalised and nutritionally at-risk populations.

The 'nutrition-smart'¹ investment approach was envisioned in the Bank's Multi-Sectoral Nutrition Action Plan (MNAP 2018–2025), developed through the support of the Banking on Nutrition (BoN) partnership. Nutrition-smart interventions that reduce chronic undernutrition are excellent investments in development programmes; for a typical African country, every dollar invested in reducing chronic undernutrition in children yields a USD16 return (The Power of Nutrition, 2021). These interventions also demonstrate benefit-cost ratios of up to 21.6% (Alderman et al, 2017). This article describes how an ongoing nutrition-smart investments initiative, which prioritises nutrition as a means for economic and human capital development in the African continent, contributed to the Bank's broader COVID-19 response.

The 'Banking on Nutrition' partnership initiative

In May 2016, the Bank's President, Dr Akinwumi Adesina, launched the BoN partnership initiative with the support of two philanthropic organisations – Big Win Philanthropy and the Aliko Dangote Foundation – to facilitate the integration of nutrition in the Bank's operations. Overall, the initiative was built on the President's vision of unlocking the human capital and economic potential of the continent by investing in what he referred to as "Africa's grey matter infrastructure". The specific goal was to catalyse efforts of member countries towards a 40% stunting reduction target by 2025.

In the bid to realise this goal, the BoN initiative encompassed a three-part approach: 1) mainstreaming nutrition into the investment bank's portfolio and pipeline, including regional and country strategies, lending programmes, non-lending programmes and other activities; 2) increasing the production and consumption of safe and nutritious foods; and 3) encouraging regional member countries to prioritise nutrition-smart lending requests and investments (ADB, 2021a).

Nutrition integration for nutrition-smart projects entails having one or more nutrition-related objectives/goals, a nutrition-related activity/intervention and a nutrition-related indicator at the outcome or impact level. Through the implementation of nutrition-smart projects, the Bank envisions achieving both socioeconomic returns and nutrition impact, thereby harnessing a double win for the Bank and its member countries (ADB, 2021a).

Nutrition integration within the different stages of the Bank's project cycle (programming, project identification, project preparation, project appraisal, implementation and completion) involved the following four key approaches:

1. Rapid **nutrition situation analysis** to identify and target groups that are at risk with respect to nutrition (i.e., the first 1,000 days of life, children under five years of age, pregnant and lactating women, adolescent girls and populations with a high stunting prevalence/burden). COVID-19 measures such as lockdowns, travel restrictions and social distancing have made these vulnerable groups more susceptible to a worsened nutrition situation since they can no longer access usual nutrition services.
2. Integration of **explicit nutrition objectives** in the relevant project investment components at the onset of the project's planning or design stage.
3. Integration of **cost effective, evidence-based nutrition activities**, including multi-sector implementation actions.
4. Articulation of **nutrition causal impact pathways** with an illustration of the potential contribution to nutritional outcomes in addition to overall project goals. The causal impact pathways provide an operational framework for setting relevant nutrition indicators to ensure that nutrition-smart interventions effectively address nutrition in the Bank's projects.

A typical design and impact pathway for an agricultural development project illustrates the double win concept of the BoN nutrition-smart investing approach (Figure 1). On the one hand, the project interventions, which include crop productivity, poverty reduction actions, women's empowerment, value chains and agribusiness development, have great potential for socio-economic returns. On the other hand lies the immediate nutrition gains such as access to

¹ Nutrition-smart African Development Bank's projects are those that are grounded in the five focus sectors of health, agriculture, water, sanitation and hygiene (WASH), social protection, and education.

and the affordability of nutritious, safe food and access to health services and intermediate outcomes such as good health, reduced morbidity and adequate dietary intake.

This impact pathway outlines a logical framework for achieving adequate nutritional status via agricultural sector interventions, providing a useful insight into how nutrition-smart projects can contribute towards immediate, intermediate and long-term nutrition outcomes.

Prior to the COVID-19 pandemic, the BoN partnership funded several nutrition smart projects within key sectors. Examples include a savannah zone agricultural productivity improvement project in Ghana, 2017 (agriculture sector), a project to support the East African Nutritional Sciences Institute in Burundi, 2019 (education

sector), a climate-smart rural water, sanitation and hygiene (WASH) development project in The Gambia, 2018 (WASH sector), improving health access and systems-strengthening in Sudan, 2018 (health sector) and humanitarian emergency assistance to cyclone and flood victims in Somalia, 2018 (social protection sector).

The Bank's nutrition-smart programming in the context of COVID-19 response

The Bank began implementing its COVID-19 response in March/April 2020 with the launch of a USD3 billion COVID-19 social bond fund alongside a COVID-19 response facility of USD10 billion for African governments and the private sector. These funding facilities were availed to assist African countries to address

the challenges and impacts of the pandemic through development projects.

In addition, the Bank's ongoing BoN partnership initiative, which had a long-term goal and focus on stunting reduction, was leveraged to supplement the Bank's efforts on combating COVID-19 in Africa. Nutrition integration in the COVID-19 response involved programmes across the five key sectors already prioritised by the BoN that accounted for more than 30% of African governments' expenditure, namely agriculture, education, health, social protection and WASH. The range of sector-focused interventions supported include strengthening the health system with a focus on nutritional care, the continuity of nutrition services and school feeding, food distribution targeting

Table 1 Examples of nutrition-smart COVID-19 projects

Project Name	Project Objective/Goal	Country	Nutrition Smart Intervention	Duration
Zimbabwe, COVID-19 response project (CRP)	To contribute to limiting the morbidity and the mortality rates related to COVID-19 in Zimbabwe through the strengthening of the health system to effectively respond to the COVID-19 pandemic.	Zimbabwe	Support for handwashing and health facilities	2 years
Support project for G5 sahel member countries to combat the coronavirus (COVID-19) pandemic	To build the capacity of G5 Sahel countries, to curb and stop the spread of the COVID-19 pandemic, and to boost the resilience of vulnerable communities.	Multi-national	Provision of food and nutrition assistance to 1.2 million people	14 months
Support programme for COVID-19 response through social inclusion and employment (PARISE)	Contribute to the mitigation of the health, economic and social shocks of COVID-19 and the achievement of resilient and inclusive growth by safeguarding employment and social inclusion.	Tunisia	Distribution of food to persons with special needs and the elderly	1 year
COVID-19 crisis response budget support programme	To support national measures to contain the spread of COVID-19 and mitigate its health, social and economic impacts.	Mauritius	Distribution of food packs to vulnerable groups - Life-saving social assistance such as food security, and access to health services and supplies will be supported in priority.	1 year
COVID-19 response support programme	Contribute to (i) the implementation of the COVID-19 health response plan, (ii) the support for social protection, and (iii) the support for the resilience of the economy.	Côte d'Ivoire	Supply of food kits, cash transfer to vulnerable households	1 year
Emergency COVID-19 response support programme (PUARC)	Support the social and economic response phase of the COVID-19 pandemic.	Senegal	Provision of food kits to vulnerable households	1 year
COVID-19 crisis response budget support programme	Contribute to (i) strengthening the health response for COVID-19 (ii) expanding social protection and protecting livelihoods against COVID-19 impact and (iii) protecting economic activities and safeguarding jobs against COVID-19 shocks.	Seychelles	Strategy to strengthen agriculture and fisheries for increased in local food production	1 year
Budget support programme in response to the COVID-19 crisis (PABURC)	To support the emergency response and strengthen the health system in order to curb the spread of COVID-19 and mitigate the socio-economic impact of the crisis on households and businesses.	Gabon	Ensuring consumer access to good quality food	1 year
COVID-19 response support programme	To support Nigeria's efforts at fighting the COVID-19 pandemic and protecting its citizens and businesses from the socio-economic impact of the pandemic.	Nigeria	Distribution of food to vulnerable households	1 year
COVID-19 crisis response budget support programme (ECRBS)	To support the NERP, Ethiopia's response plan to the COVID-19 pandemic, which includes strengthening of healthcare service preparedness and response, protection of livelihoods, especially for the vulnerable, and support to private sector enterprises.	Ethiopia	Development of an education response plan to school feeding programme	1 year
COVID-19 crisis response support programme	To mitigate the health and social impact of the COVID-19 crisis, and to maintain macroeconomic stability.	Cabo Verde	Food assistance schemes for vulnerable people	1 year
COVID-19 crisis response budget support programme (PABRC)	To check the spread of the coronavirus to save lives by mitigating its adverse socioeconomic effects on the country, particularly on households and businesses.	Cameroon	Diversifying of agricultural production (poultry, fish, seeds and cereals)	1 year
Project to support member states of (CEMAC) and the DRC to fight the COVID-19 pandemic	To strengthen surveillance at points of entry (air, sea and land routes) to build essential sub-regional and national capacity for COVID-19-related epidemiological surveillance and case management to ensure the availability of stocks of products for the prevention, control and treatment of symptoms and ensure communication and coordination at the regional level.	Multi-national	Distribution of food and handwashing kits	1 year

Source: Project Report-The African Development Bank COVID-19 Response in Africa: Prioritizing Nutrition

vulnerable groups, improved access to WASH facilities and supporting diversified agricultural production.

This ongoing initiative on nutrition-smart programming facilitated the Bank's prompt integration of nutrition into its COVID-19 response projects within member countries. An example of early support was the project designed to support G5 Sahel member countries (Burkina Faso, Mali, Mauritania, Niger and Chad) to combat the COVID-19 pandemic, the overall goal of which was to build the capacity and resilience of these countries to mitigate and stop the spread of COVID-19. This project integrated the procurement of food and nutrition products for emergency food distribution to 10,000 households, especially women-headed households, across the five countries. The implementation period was 14 months (April 2020 to June 2021).

Additionally, nutrition objectives were incorporated into the design of several country budget support programmes during the early days/months of the global COVID-19 pandemic. Table 1 presents some examples of the nutrition-smart interventions among the Bank's COVID-19 response projects implemented in African countries.

Interim results of the Banking on Nutrition partnership initiative

According to the BoN progress report (2021), the Bank leveraged USD2.3 billion between 2015 and 2020 for the implementation of nutrition-smart projects in Africa. The proportion of nutrition-smart projects between 2015 and 2020 increased from 5% to 18%, and 21% of the project interventions focused on women and children. The full results and the impact of the BoN efforts towards contributing to stunting reduction in Africa are expected to be available at the end of the seven-year period of the Bank's MNAP (2018–2025). This ambitious seven-year MNAP timeline is consistent with the United States Agency for International Development's view of using a longer timeframe (e.g., more than five years) and the use of multiple interventions as an appropriate approach to address stunting (USAID Advancing Nutrition, 2020).

Another key result from the BoN partnership initiative was the development and release of a high-level decision-making Continental Nutrition Accountability Scorecard² through the African Leaders for Nutrition platform. The Continental Nutrition Accountability Scorecard was designed to mobilise country-led efforts towards addressing stunting and attaining other nutrition targets.

The BoN initiative has set the Bank on a path to achieve a double win for member countries by harnessing both nutrition gains and socioeconomic returns from the project's implementation. BoN partners engaged with Nutrition International through its Nutrition Technical Assistance Mechanism (NTEAM) to support the operation of the Bank's MNAP. Customised technical assistance packages were developed through NTEAM to help the Bank realise its

nutrition-smart investment targets. Through these packages, the NTEAM supported nutrition integration into COVID-19 response programmes as well as the Bank's pipeline portfolio on economic growth and human development.

Challenges

The integration of nutrition into the Bank's development programmes came with its own challenges such as the institutional capacity-building requirements to support nutrition integration during project design and implementation. Examples of these challenges include project team fatigue and apprehension of addressing multiple cross-cutting issues (i.e., gender, nutrition, climate change and youth) that were required to be considered and incorporated into a project. Also, there was limited understanding and appreciation of the minimal changes required in a project to make it nutrition-smart. In addition, the limited awareness about the Bank's existing MNAP was a constraint to driving institutional capacity-strengthening on nutrition.

These challenges were overcome through:

- Demystifying the term 'nutrition integration' and conducting a practical exercise on how to design a nutrition-smart project during the Bank's staff training workshops at the Bank's regional hubs. The post-workshop evaluation showed that 100% of the participants at the Southern regional hub workshop noted that "integrating nutrition is feasible".
- Organising a nutrition-sensitisation event at the Bank's headquarters to create awareness of the MNAP and disseminate information on nutrition integration into the Bank's portfolio.
- Developing integrated impact pathways for the five priority sectors to illustrate the theory of change and entry points for the Bank's traditional projects or programmes to become nutrition-smart. These five sector briefs and other nutrition guidance resources are publicly accessible.
- Developing a nutrition marker and project checklist as a quick guide and reference tool for nutrition-smart programming. A

tracking nutrition dashboard was also developed to monitor and report on the Bank's MNAP performance targets.

Conclusion

This article highlights how a multilateral development bank can take the leadership for nutrition through partnership initiatives that support nutrition integration in human development and economic growth programmes. It also demonstrates that prompt contributions to health, pandemic and emergency response programmes can be made by a multilateral development bank. Most importantly, amidst the COVID-19 pandemic, the BoN was proactive to ensure continued nutrition prioritisation within COVID-19 response programmes. The BoN initiative is a unique example of a successful partnership engagement between a multilateral bank, donors and a nutrition technical assistance partner towards positive nutrition outcomes. The BoN progress report indicates positive evidence of a partnership that is working successfully to garner results for nutrition and economic growth while utilising a nutrition multi-sector action plan.

We encourage other stakeholders – multilateral banks, donors, governments, civil societies, non-governmental organisations and private stakeholders across sectors – to consider adopting this approach to facilitate nutrition gains towards the 2025 World Health Assembly and the 2030 SDG targets.

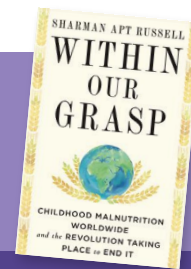
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The African Development Bank's nutrition resources can be found through Nutrition International's learning centre, available at: <https://afdb-nutritionintl.talentlms.com/index>

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Book review: 'Within Our Grasp' by Sharman Apt Russell



This article builds upon a news item featured in Field Exchange 65¹, where ENN announced the publishing of a new book by Sharman Apt Russell. This follow-on article features a review of 'Within Our Grasp' and highlights some of the key takeaway messages



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Childhood malnutrition is a difficult topic to write about. Often, the majority of airtime for this lamentable subject veers between two narrative extremes, making it difficult to access the full story. On the one hand, densely populated statistical reports with an impenetrable array of numbers target readers in the public health community, effectively quantifying the vast burden of malnutrition yet reducing the stories of these children to percentages on a graph. On the other, there are sullen campaign videos – often edited in black and white and featuring a matching voiceover – or donor newsletters, strategically drafted to invoke an emotional response in their readers. Both, of course, are products of their respective environments (raising funds to combat malnutrition and appraising the evidence on how that money should be spent) and, therefore, both play an important role within the humanitarian and development sector. Nevertheless, both mediums are inherently flawed in their ability to provide insight to this complex arena. By contrast, 'Within Our Grasp' sits neatly between these two extremes and makes for a compelling read for those looking for a recap on childhood malnutrition. Namely, where are we right now and how did we get here?

With this in mind, Russell effectively steers the reader through the story of malnutrition, its history and its evolution, framing it as a personal narrative, a far cry from that which can be found in most textbooks and journals today. For those with a scientific background, the narrative may come across as wordy and the book cannot be described as lean. However, this permits *Within Our Grasp* to be accessible, as the dilution of technical language allows the book to remain engaging yet factual, empowering readers of all types to learn something new. That is not to say that *Within Our Grasp* is devoid of empirical evidence. On the contrary, Russell has diligently researched the topic at

hand, providing a helpful array of references and prevalence statistics on global malnutrition to satisfy the numerically curious among us.

The content, although focused on nutrition, is also wide-ranging, featuring topics such as the Doi Moi reforms in Vietnam, the practice of agroecology and the theory of fighting poverty with profitability using the 'Fortune at the Bottom of the Pyramid' concept put forward by the economist, C.K. Prahalad. This helps to frame the malnutrition problem as it is, multifaceted in nature and multisectoral in solution, exposing readers to ideas from different fields by showing them the value of cross-functional collaboration. Nevertheless, the bulk of knowledge sharing is still rooted in nutrition science, where *Within Our Grasp* effectively refreshes our minds on the aetiology of undernutrition. In particular, the book succeeds in talking to the audience through the evolution in thought surrounding kwashiorkor, guiding readers through the various theories postulated over the last few decades, culminating in the current microbiome hypothesis which is still up for debate (Smith et al, 2013).

What sets this book apart is the personal stories embedded within the scientific explanations where Russell writes fondly of her experiences in Malawi, a low-income country that has played an important role in generating the evidence around childhood malnutrition. This provides context to the scientific breakthroughs that are outlined. The stories from the frontline reaffirm the importance of this subject and the lives that are impacted by every missed opportunity. The book quite rightly details the work of pioneers within nutrition (Steve Collins, André Briend, Mark Manary), medicine (Cicelly Williams, Mario Capecchi) and engineering fields (William Kamkwamba), which has the dual benefit of explaining how much work has gone into this issue so far, while also providing inspiration to future leaders and disruptive thinkers in the field.

As well as detailing these pioneers, Russell also draws attention to lesser-known projects and organisations that have been doing, and are continuing to do, important work in combatting childhood malnutrition. Some readers will already be familiar with the inventions that Russell articulates in this book such as ready-to-use therapeutic food (RUTF), specifically Plumpy'Nut – a gamechanger in the humani-

tarian sector. This is an important story, but *Within Our Grasp* goes further by shedding light on other innovative projects that deserve recognition. Moringa Miracles Limited, whose mission is to deliver a triple bottom line in Malawi, namely commercial success, social and environmental impact, is an example of such an enterprise. Other success stories include Mary's Meals, which implements life-changing school feeding programmes in low-income countries, and Project Peanut Butter, another Malawian export which has played an important role in the development of RUTF.

Another innovative idea that Russell highlights, and one which may nod to the future of the humanitarian aid delivery model, is ColaLife, a non-profit organisation which was founded on the following question: "Coca-Cola seems to get everywhere in developing countries, yet life-saving medicines don't. Why?". Russell recognises the importance of highlighting these relative success stories, providing a much-needed change of pace from the sobering statistics put forward in large-scale documents, such as the joint UN-agency State of Food Security and Nutrition in the World 2021 Report (FAO).

At its core, *Within Our Grasp* leaves the reader with a defining sense of hope sullied by a dose of pragmatism. It is a summary piece that outlines the innovations and "revolution", to use the author's words, which preceded its publication. It is true that great progress has been made in the childhood malnutrition sector over the last few decades, yet Russell is keen to highlight that the industry is at a turning point. Ending hunger is 'Within Our Grasp' – perhaps closer than ever – yet more needs to be done. In this case, 'more' refers to novel ways of approaching the challenge of malnutrition, with the sector requiring great transformation in the years to come.

For more information, please contact Thomas Stubbs at thomas@enonline.net

¹ <https://www.enonline.net/fex/65/withinourgraspmalnutritionbook>

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Prioritising Emergency Response Preparedness: Global Nutrition Cluster supports countries to plan for potential humanitarian crises

This article describes how an ongoing nutrition-smart programming approach was employed by the African Development Bank and harnessed as part of its COVID-19 response intervention



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The information in this document expresses the authors' personal views and opinions and does not necessarily represent UNICEF's position.

Background

The 2022 Humanitarian Overview estimates that over 274 million people will need humanitarian assistance and protection in 2022, the highest annual figure recorded to date. The magnitude, frequency and duration of crises are rising due to climate change, conflict and the COVID-19 pandemic. Humanitarian emergencies exacerbate nutritional risks and often increase wasting and micronutrient deficiencies in vulnerable population groups including women, children, adolescents, people with disabilities and the elderly.

Over the last few decades, the global humanitarian agenda and policies have increasingly focused on resilience to ensure people, communities and countries are best prepared to anticipate, manage and recover from shocks for sustainable long-term progress. In 2015, the Inter-Agency Standing Committee (IASC) developed the Emergency Response Preparedness (ERP) approach to improve the humanitarian system's readiness to respond to crises (see Box 1). The ERP approach consists of three key elements including risk analysis, preparedness actions and contingency planning and closely aligns with the Humanitarian Programme Cycle, if activated. With the increasing frequency and magnitude of emergencies that potentially affect every country, coupled with the global COVID-19 pandemic and the related response efforts, adopting emergency preparedness for a potential nutrition response has never been more relevant.

Prioritising ERP

The new Global Nutrition Cluster (GNC) Strategy (2022-2025) highlights a shift in focus from providing operational and technical support

during Nutrition in Emergencies (NiE) response and recovery phases to including support for *preparedness* for humanitarian crises and covering the protection of the nutrition status of people *at risk* during situations of fragility.

Emergency preparedness for nutrition can be conducted at various levels and involves a wide range of actors such as aid agencies, national institutions and organisations, inter-sectoral teams and the private sector. The ERP approach enables country teams in low, medium to high-risk contexts to identify and unpack potential response activities and to implement these activities as well as to identify and prioritise gaps in preparedness. Examples of preparedness actions for nutrition include ensuring that a dedicated nutrition coordination mechanism is established, the rationale and methods for needs assessment and analysis are understood by partners and that capacity mapping is performed and regularly updated.

However, not every country routinely conducts a preparedness exercise with many completed on an ad hoc basis. The GNC identified the need to prioritise ERP following the 2020 Cluster Coordination Performance Monitoring exercise conducted with 20 countries and through discussions with country-level coordination teams. Most countries did not have a preparedness mechanism in place – and for those that did, the plans were either not comprehensive or did not follow standard guidelines. As a result of this exercise and in line with the new strategy, ERP has been made a priority for the global-level GNC operational support team.

ERP approach

In practical terms, the ERP approach is led by the resident/humanitarian coordinator

BOX 1 Preparedness of the International Humanitarian System

The Global Nutrition Cluster (GNC) supports the Emergency Response Preparedness (ERP) approach of the Inter-Agency Standing Committee (IASC). The ERP approach is designed to allow the humanitarian community to proactively prepare for crises requiring a coordinated international response. The aim is to increase the speed and volume of life-saving assistance delivered in the first four to six weeks of an emergency. The ERP approach provides tools for United

Nations country teams and/or humanitarian country teams to:

- Understand the risks and establish monitoring systems
- Establish a minimum level of preparedness
- Take additional action, including developing contingency plans, to ensure readiness to respond to the identified risks

All GNC ERP guidance aligns with the IASC ERP approach guidance thus building on global- and

country-level emergency response preparedness actions. The extent of the involvement of national and sub-national authorities depends on the context. In all situations, emergency response preparedness should be based on knowledge of the planning, capacities and systems of national and local authorities. This synergistic alignment of efforts recognises the complementarity of humanitarian actors across sectors and promotes collaboration.

managed by the humanitarian country team and supported by the inter-cluster/sector coordination group and clusters/sectors. As with the humanitarian needs overview (HNO)/humanitarian response plan (HRP) approach, each cluster is expected to contribute to the United Nations Office for the Coordination of Humanitarian Affairs (OCHA)-led process and has its own unique role. However, unlike the HNO and HRP approaches, the ERP approach offers greater flexibility. For example, preparedness may not be initiated by OCHA or the inter-agency preparedness response may not adequately address nutrition. In these contexts, the Nutrition Cluster may decide to conduct its own ERP exercise, bearing in mind that governments hold the primary responsibility for providing humanitarian assistance, with the ERP providing guidance on how the international humanitarian community can support and complement national action.

The aim of ERP is to identify the most appropriate response activities for a given crisis and ensure that operational readiness is in place to respond quickly and effectively in the first four to six weeks of an emergency. However, this is not an isolated approach and preparedness is an integral part of the Humanitarian Programme Cycle process. Additionally, conducting an ERP exercise identifies the additional risks not captured by the HNO or HRP approaches. If an emergency does occur, this may result in the amendment of the HRP or an annexed response plan as seen in recent examples with Myanmar and Afghanistan (See Box 2).

Key steps in the ERP process

Risk analysis & monitoring

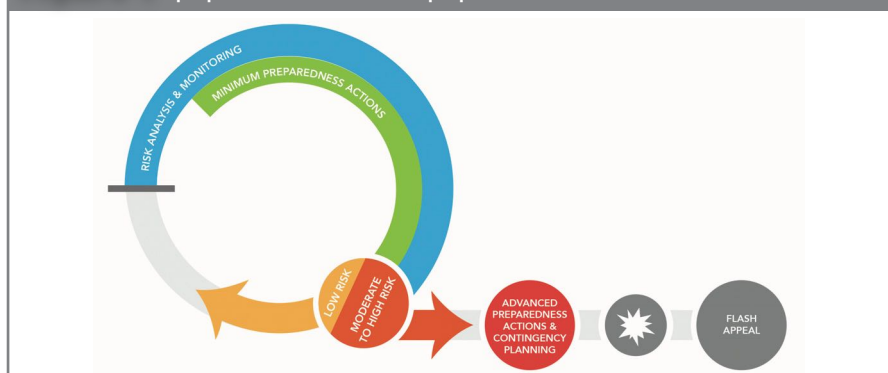
The risk analysis identifies the factors that could trigger a crisis and ranks these in terms of impact and likelihood with those identified as medium or high requiring contingency planning. Risk analysis is integrated into the HNO process and draws from the expertise of a wide range of partners including aid agencies, national institutions and organisations and independent experts. A clear and common understanding of the risks faced by a country is fundamental to the ERP process.

Risk monitoring provides early warning of emerging risks which allows for early action. Monitoring should be indicator based with at least one person or entity tasked with monitoring the indicators for each hazard on a scheduled basis using updated information. Relevant nutrition outcome indicators and key contributing indicators should be used. For example, in a drought disaster scenario, trends on the prevalence of wasting and food consumption scores from surveillance systems can be included in the monitoring system. However, in a sudden onset disaster scenario such as flooding, monitoring information can be obtained from the Global Flood Awareness System and national meteorological forecasts which is usually communicated through inter-agency platforms.

Contingency planning¹

A contingency plan is required for risks identified as medium or high through the risk analysis (which fall outside of any existing HRP). This plan provides an overview of humanitarian partners' capacities and approaches to meet the immediate

Figure 1 Sequencing of ERP components: risk analysis and monitoring, minimum preparedness and advance preparedness actions



needs of affected communities in the first four to six weeks of the response and prioritises preparedness actions through a workplan. In general, contingency plans consist of six main sections including: (1) a situation and risk analysis (including gender and diversity analysis); (2) a response strategy; (3) operational delivery; (4) coordination, management and operational support arrangements; (5) preparedness gaps and actions; and (6) funding requirements. The contingency plan should be updated and modified when more specific information becomes available and build upon the relevant preparedness actions discussed below. The most common contingency measures for the Nutrition Cluster include:

- Scaling up/strengthening coordination at local level
- Scaling up programmes to cover new areas; for example, a new outpatient therapeutic programme may be established in health centres not previously providing this service and hospital bed capacity for inpatient care may be increased.
- Scaling up nutrition assessments and referral screening; for example, increasing the frequency of mid-upper arm circumference (MUAC) screening to allow for the early detection of new cases; planning SMART surveys in high-risk areas; ensuring systematic screening at health consultations and establishing/expanding mothers' MUAC for diagnosis and referral of malnutrition.
- Early procurement of therapeutic food, drugs, anthropometric materials and supplies needed for nutrition programmes.
- Pre-positioning of food and supplies in regional, district or point-of-delivery facilities.
- Contracting of vendors and service providers for the provision of cash or vouchers. Cash and voucher assistance allows recipients to purchase locally available goods (nutritious foods, sanitation and hygiene items, water) and can facilitate access to health/nutrition services by covering direct costs (e.g., consultation fees, medication) and indirect costs (e.g., transportation, accommodation).
- Training/retraining of staff based on identified needs and gaps. Staff may include management staff (e.g., Ministry of Health nutrition focal points at district level), healthcare providers (e.g., nurses, doctors), community health workers and support personnel (e.g., distribution agents, Information Management Officer, etc.).

If the emergency occurs, the contingency plan should feed into the flash appeal for funding and speed up its allocation.

Preparedness actions

Minimum Preparedness Actions (MPAs) represent a set of core preparedness activities that need to be undertaken by low-risk countries to achieve positive outcomes in the initial phase of the emergency response. MPAs focus on practical actions to improve response, accountability and predictability. They also promote more effective coordination between humanitarian actors, considering the perspectives of affected populations through situation (baseline) and needs analysis which includes the collection of sex- and age-disaggregated data. MPAs are particularly useful for contexts where humanitarian capacity is limited and where any potential response would rely on external capacity.

Advanced Preparedness Actions (APAs) are designed to guide the nutrition coordination team towards an advanced level of readiness to respond to a specific risk. Unlike MPAs, APAs are risk-specific and build on the existing MPAs.

Countries with ongoing emergencies, or with medium to high risks, should have a workplan which consists of both minimum and advanced preparedness actions which respond to specific risks – most countries supported by the GNC will fall into this category. This mixed basket is required to ensure an advanced level of readiness to respond to the identified risks.

Preparedness support for countries

The GNC is currently developing a series of resources and tools to better support country coordination teams with preparedness. The first step was the publication of the GNC Preparedness Guidance² which aims to help country-level Nutrition Clusters, nutrition sector coordination and nutrition working groups to strengthen collective preparedness towards the effective protection of the nutritional status of populations. The document primarily focuses on preparedness actions and touches on the risk analysis process and contingency planning (it is due to be updated to take into account IASC 2020 Guidance).

¹ According to latest IASC guidance (under publication), contingency planning is the second element of the ERP Approach.

² https://www.nutritioncluster.net/resource_GNC_preparedness_guidelines

Box 2 Afghanistan example

While Afghanistan has an active Humanitarian Programme Cycle, contingency planning processes were completed prior to the withdrawal of US troops to ensure an advanced level of readiness to respond to the humanitarian consequences due to the potential armed conflict. The contingency planning processes included the identification and implementation of several preparedness actions from strengthening coordination mechanisms at national and sub-national levels to increasing the frequency of monitoring trends of wasting.

In 2021, two webinars on ERP were conducted by the GNC, an introduction to ERP Planning for Nutrition Coordination Mechanisms,³ where a pilot was launched to set up ERP platforms in 10 countries, and an ERP Satellite event⁴ at the GNC Annual Meeting. In addition, the GNC has developed online tools⁵ and a workshop package⁶ to support countries in their ERP approach process and these will be updated following the pilot and lessons learned workshop. Furthermore, the GNC has developed an e-learning module on the ERP approach⁷ and is currently developing additional modules specifically on the use of the GNC ERP tools.

Myanmar: An ERP case study

Myanmar was the first country to finalise its ERP process using the GNC’s guidelines and tools alongside deployment support from the Technical Support Team’s Nutrition Cluster Coordinator. This was achieved against a backdrop of an evolving humanitarian crisis in which the country’s military forces seized power from the government on 1 February 2021, just weeks after Myanmar finalised its 2021 HRP. The operating environment in the country has become more complex as nutrition partners work to reach affected populations while attempting not to engage with the de facto authorities in a way that legitimises them.

Myanmar’s nutrition sector organised a three-day ERP workshop in April 2021 to mobilise assistance to those affected by the humanitarian crisis. The workshop was attended by over 70 stakeholders including non-governmental organisations (NGOs), international NGOs and the private sector with the active participation of the Scaling Up Nutrition Movement platform and networks although government actors were not involved due to the coup. The main aims were to

identify various hazards in different parts of the country that had not been included in the HRP 2021 and to develop a contingency plan. High-risk hazards were confirmed as armed conflict and floods with COVID-19 classified as medium risk. All three risks were included in the contingency plan which included agreed priority interventions and geographical areas for preparedness actions.

The timing of the ERP process was challenging as it took place during the peak of the armed conflict when partners were expected to provide planning for a response rather than for preparedness. However, the ERP workshop did present an opportunity for nutrition partners to ‘think on their feet’ and agree on some immediate actions. One outcome was the establishment of technical working groups for the integrated management of acute malnutrition and infant and young child feeding in emergencies and assessments for partners to be able to quickly operate, scale up and deliver life-saving activities in the current context. While humanitarian response efforts were timely in areas where there was an established operational NiE presence, response efforts in other geographical areas were slow primarily due to financial, human and programmatic resources. The Myanmar Preparedness Action Workplan⁸ has now been developed with the funding requirements updated as new information is received.

OCHA Myanmar activated an ERP working group with the participation of all sectors and clusters but ERP processes are at different stages for different actors. The nutrition sector was the first to complete the ERP process using the new IASC guidelines and this has been instrumental to ongoing OCHA processes especially the HRP 2021 revision and to mobilising funding for Myanmar humanitarian projects.

Remaining challenges

Making ERP a priority for all stakeholders, including donors and academia, remains a challenge and many countries are still prioritising the response to humanitarian crises. Although countries are becoming more fragile due to the increased frequency and intensity of natural disasters and an increase in the complexity of conflicts, humanitarian coordination teams at country level are still not fully aware of ERP processes and there is limited funding for the effective implementation of preparedness actions. The need to strengthen the capacity of humanitarian actors and to continuously update ERP processes are key lessons learned to prepare well for the future. This could

be partially achieved through better addressing ERP including early actions in the Humanitarian Programme Cycle and addressing it as an annual output alongside the HNO, the HRP and the Cluster Performance Monitoring exercise.

GNC Coordination Team efforts, as outlined under the preparedness support for countries and the next steps below, seek to ensure harmonised ERP tools and processes across country clusters/sectors. This is now being achieved in those countries that are taking part in the piloting phase as seen in the Myanmar example. There is also a need for a more standardised approach since methods can vary between government-level approaches and those formulated by clusters in conjunction with OCHA. It is important to address how to avoid duplicated efforts and to ensure everyone is ‘on the same page’ when it comes to ERP.

Next steps

The GNC is expanding its guidance on the ERP process by conducting a lessons learned workshop with those countries that participated in the GNC ERP guidance piloting, updating all guidance based on the findings of this pilot, finalising an ERP checklist and building capacity through the development of two additional e-learning modules (Introduction to GNC ERP tools and Developing a contingency plan with partners) and organising regional-level training for Nutrition Cluster Coordinators. Many of the key ERP elements developed by the GNC can be used to expand work that has already taken place at country level on preparedness while aligning with the methodology implemented by OCHA and building on preparedness efforts led by other actors including local authorities.

In addition to Myanmar, other countries that participated in the piloting of the new GNC guidance are at various stages of the ERP process. These include Afghanistan, Bangladesh, Niger, Sudan, DR Congo, Ethiopia, Lebanon, South Sudan, Yemen and Somalia. Feedback and lessons learned from these countries will be used for the subsequent revision of the GNC ERP guidance.

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³ https://www.nutritioncluster.net/event/GNC_ERP_webinar
⁴ <https://www.nutritioncluster.net/node/27716>
⁵ <https://ee.humanitarianresponse.info/x/0G6SQRqw>
⁶ Available on request to the GNC.
⁷ <https://agora.unicef.org/course/info.php?id=33238>
⁸ <https://www.nutritioncluster.net/preparedness>

Table 1 Draft Response Plan and Preparedness Priorities April 2021

Hazard scenarios	Score	Key immediate needs					Response funding requirements in USD millions	Prioritised preparedness actions (examples)*
		IYCF-E	BSFP U5 & PLW	Severe wasting treatment	Moderate wasting treatment	MNP		
Floods	25	99,912	265,612	1,632	7,946	165,700	18.4	<ul style="list-style-type: none"> • Technical Working Groups created • Contact list of nutrition partners made available and updated • Rationale and methods for needs assessment and analysis understood by partners • Rapid and standard nutrition assessment agreed by all partners • Capacity mapping performed and regularly updated
Armed conflict and civil unrest	25	68,549	161,738	4,606	26,714	93,189	33	
COVID- 19	9	41,547	106,596	4,409	18,304	65,048	12.3	

Blanket Supplementary Feeding Program for Children <5 Years and Pregnant and Lactating Women (BSFP U5 & PLW); Infant and Young Child Feeding in Emergencies (IYCF-E); Multiple Micronutrient Powder (MNP)

*The preparedness actions are relevant for the three hazards, however, each scenario required specific anticipatory actions.



Women's daily workload, Ethiopia

Link Nutrition Causal Analysis for undernutrition: An analysis of recommendations

This article analyses some of the recommendations arising from Link NCA studies around the world and highlights the importance attached to considering community perspectives



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The author thanks Margot Annequin for her contribution to the analysis and Lenka Blenarova (ACF-UK), Dieynaba Ndiaye (ACF-France) and Myriam Ait Aissa (ACF-France) for their review.

Background

Action Contre la Faim (ACF) is a humanitarian non-governmental organisation (NGO) that has been involved in the treatment and prevention of undernutrition for over 30 years. To strengthen the analytical basis of its programmes, ACF developed a structured methodology for conducting a causal analysis of undernutrition, in particular wasting, called 'Link NCA'¹. This method is multi-sectoral, local and participatory, combining quantitative and qualitative data analysis and consultation with local experts and/or the communities involved with tackling malnutrition (See Box 1).

Since the development of Link NCA, the method has been used by more than 40 studies around the world. This article presents the findings from an analysis of the recommendations made by NCA analysts and the communities involved in the studies. Overall, the analysis

aimed to strengthen the ownership of Link NCA results by both the humanitarian actors and the affected communities through (1) clarifying the recommended sectors and intervention modalities according to the risk factors identified by Link NCA; and (2) comparing the recommendations produced by the communities and the analysts.

Methods

The final reports of 43 Link NCA studies, published on the ACF website and in the ACF archives, were used for this study. From these reports, three databases were created and analysed:

1. A study database: n=43. This describes the

context of the study and the content of the report: country, year of publication, language, funder, partnership context, crisis context, rural/urban context, recommendations etc.

2. A risk database: n=725. The risk factor database includes, for each study, the malnutrition risk factors selected and prioritised during the final stakeholder workshop². The prioritisation of risk factors is based on a triangulation of the quantitative and qualitative results of each Link NCA and the scientific evidence available on a particular risk factor³. Each line in the

Box 1 About Link NCA

Link NCA (Nutrition Causal Analysis) is an established participatory and results-oriented methodology for analysing the multi-causality of undernutrition to inform context-specific nutrition-sensitive programming. The Link NCA methodology was developed to help researchers to discover the causal pathways of undernutrition, considering multiple sources of data including statistical associations with a variety of individual and household indicators that depict the broader environment, changes in patterns of undernutrition over time and seasonally and recommendations for programming based on the consensus of risk factors likely to be the most modifiable by stakeholders.

To answer these questions, Link NCA studies employ a mixed-methods approach, combining both qualitative and quantitative research methods, and draw conclusions and recommendations from a synthesis of the results. The Link NCA is carried out in the following five steps: the preparatory phase, determining the parameters and methodology; the identification of hypothesised risk factors and pathways through a systematic literature review and initial interviews; community-level data collection including qualitative enquiry and possible quantitative nutrition surveys; the synthesis of the results and building a technical consensus through a final stakeholder workshop; and communicating the results and recommendations and planning for a response.

For more information see <https://www.linknca.org/>

¹ <https://linknca.org/>

² The term 'stakeholders' should be understood here in a broad sense: technical experts, field workers, community leaders, traditional and religious leaders, political leaders, community-based organisations, official institutions and NGO representatives.

³ Chapter 7 of the methodological guide, available at <https://linknca.org/methode.htm>.

database corresponds to a risk factor. The sectors of activity and the prioritisation (major, important, minor) that are chosen at the final workshop were also entered.

3. A recommendation database: n=1646. The recommendation database includes the recommendations issued by the analysts for the 43 studies. If the analyst separated the recommendations from the community, these were encoded separately.

Results

Characteristics of the included studies

Five Link NCA studies were conducted in Ethiopia and five in Bangladesh followed by four in Kenya and three in Chad. One quarter of the studies (n=10) were published in 2017 with between two and six studies published annually since 2011. One third of the final reports were published in French, two thirds in English and one report was published in Spanish. Just over half of the studies (n=24) were conducted using the full Link NCA methodology incorporating qualitative analysis, a quantitative assessment of the prevalence of undernutrition and an analysis of the risk factors. Of the studies, 20% (n=9) did not include a prevalence study, with most conducting secondary analyses of existing data, and 10% (n=6) used only the qualitative methods. The largest funder of the studies was the European Union (n=11) followed by UNICEF (n=7). Eight out of 10 studies were carried out by ACF, either independently or in collaboration with other organisations. Four out of five studies (n=34) were conducted in territories with high stunting and five were conducted in refugee camps. The majority (88%) of the Link NCA studies presented risk factors for malnutrition with a median of 20 risk factors identified and ranked across the studies. Apart from three studies, all contained operational recommendations, of which 40% were collected by Link NCA analysts.

Risk factor analysis

Figure 1 shows the ranking of importance of the identified risks by sector. Risk factors related to food security and livelihoods were identified more often than risk factors from other sectors. Risks related to water, sanitation and hygiene (WASH) were more frequently ranked as 'major risks' across the Link NCA results. These were also more likely to achieve consensus during final stakeholder workshops than other risk factors.

Risks within the health and nutrition sector were ranked as 'important' more often than those from other sectors.

Overall recommendations

Of the 43 published studies, 40 studies made recommendations (from the analyst and/or from the community) where a risk factor was identified/hypothesised and prioritised, giving a total of 1,646 recommendations. Of all the recommendations, 49% came from studies where community recommendations were collected and 21% were community recommendations. These were listed separately by the researchers.

Of all of the recommendations, 29% were related to food security, 22% to health and nutrition, 21% to WASH, 12% to mental health and care practices and 10% to gender. These figures differ slightly from the distribution of risks because multiple recommendations are often issued for the same risk. However, as with the risk factors, recommendations relating to the food security sector were the most numerous followed equally by recommendations for the health and nutrition and water and sanitation sectors.

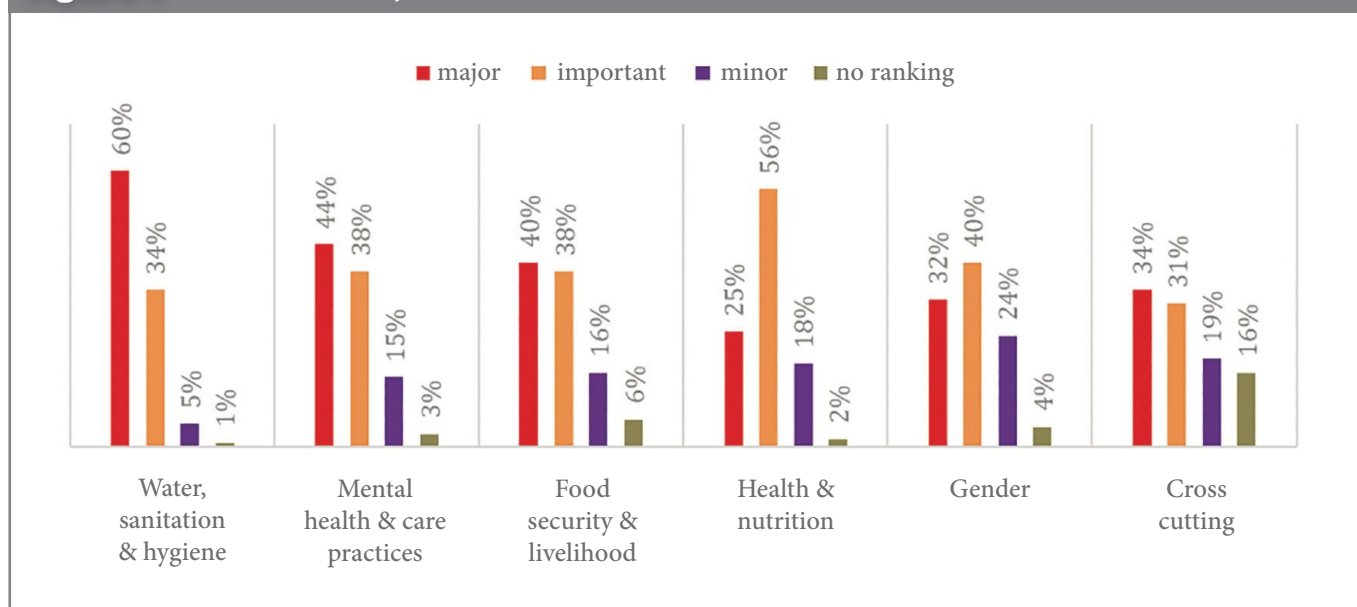
Recommendations from community vs from analysts

Of all the Link NCA studies, 40% (n=17) collected community recommendations through a community workshop/meeting at the end of the survey. The studies conducted by ACF

within a consortium collected more community recommendations than studies conducted by ACF alone or by another organisation. While the results must be interpreted with caution due to the small size of the study, it appears that community recommendations were more likely to be collected by analysts in stable contexts rather than during acute crises, in rural settings rather than in refugee camps and in studies using a full Link NCA methodology. For those studies where community recommendations were collected, an NGO's response plan was more likely to already be in place.

When comparing the recommendations made by the communities with those made by the analysts, there were differences in the distribution of recommendations by sector. Overall, the community recommendations related more to food security and livelihoods and gender than the analyst recommendations. Recommendations around health and nutrition, mental health and care practices were represented more in the analysts' recommendations. The community recommendations were more focused on improving access, building or rehabilitating and distributing inputs than the analysts' recommendations with 43% of the community recommendations relating to improving access to essential services. Among the analysts, recommendations for raising awareness were most common (23%). The reasons for these differences in the distribution of recommendations between the community and the analysts are likely to be many and varied. For example, the relative importance given to gender issues by the communities compared to the analysts may reflect possible gender bias among the experts at the final stakeholder workshops and a tendency for analysts to favour more easily operational interventions such as awareness raising than those of gender-related social transformation. Ultimately, the reasons are perhaps less important than the differences which highlight

Figure 1 Prioritisation of risks by sector



Box 2 Example of the proposed use of the Link NCA methodology to inform the implementation of the MAM'Out project in Burkina Faso

The MAM'Out project aims to evaluate two innovative approaches to prevent wasting in the Tapoa province of Burkina Faso. The first approach is a child-centred, educational and home-based family development strategy to mitigate the contextual factors affecting households vulnerable to undernutrition. The second consists of a seasonal and multi-annual cash transfer (CT) programme, providing a safety net to economically and nutritionally vulnerable households with children less than two years old. In order to fully adapt this intervention to the Sahel households' context, a deeper analysis of the causes of undernutrition using Link NCA will be conducted. This will help to determine the relevance of CTs in this setting as well as identify the appropriate criteria for targeting the CT programme.

the importance of a community's involvement in decision making for its own issues.

Strengths and limitations of community recommendations from Link NCA studies

While the Link NCA methodology adopts a participatory approach, more than half of the Link NCA studies did not incorporate the community recommendations and/or did not highlight these in their final reports. For those studies that did collect the community recommendations, these were often included as annexes and lacked visibility in the reports despite the fact that they differed to the recommendations made by the analysts.

Whether related to women's capacity to make decisions about their children's care, their economic independence, workload and access to contraceptive methods or the involvement of men in the response to malnutrition, women's voices are rarely heard in scientific publications or in Link NCA expert workshops. However, the collection of qualitative data during Link NCA studies provides an opportunity to inves-

tigate and vocalise such areas that may be under-represented in nutrition programmes.

This Link NCA review highlights the need to systematically collect and feature community recommendations in Link NCA reports. This would ensure that community knowledge and perspectives are valued and contribute to a global community health approach in which those affected are involved in the co-construction of the response (Bouville, 2001). This is in line with the Inter Agency Standing Committee commitments to Accountability to Affected Populations⁴ and would also contribute to a paradigm shift in humanitarian aid (Ryfman, 2011) with benefits at all levels. Such benefits would likely include better adapted and more appropriate programmes that are, in turn, more effective, a more just and ethical aid relationship that avoids the vertical relationship of power. Above all, the amplification of the voices of those who suffer the consequences of poverty would be better achieved. Consulting communities and prioritising their recommendations can also address the challenge of responding to the large number of risk factors identified in the studies.



Women shopping in the local market, Ethiopia

Compared to other survey methodologies, Link NCA provides a dominant place for qualitative investigation. This presents an opportunity for NGOs to reposition themselves with the affected populations, to intensify dialogues and to gain a deeper understanding of the determinants of, and responses to, malnutrition (Freeman Grais, 2016). Giving a voice to those affected by malnutrition is particularly urgent in the context of escalating community needs amidst limited resources (Aperçu Humanitaire Mondial, 2022), the need to improve coverage and sustainability of programmes (Blanárová, 2016) and the weakening legitimacy of NGOs in the field.

Conclusion and next steps

This analysis of recommendations does not cover all the issues raised by the Link NCAs but it does highlight the need for humanitarian actors to work with greater awareness of the perspectives of individuals and communities. This is part of a global movement to recognise people's capacity to act, critique and exercise their will as humanitarian stakeholders and having their own political agency. Box 2 provides an example of how Link NCA is being used to tailor a CT programme targeting undernutrition more appropriately to the needs of the community. The co-construction of aid projects with the communities concerned should move from intention to action. This approach is all the more urgent as it will respond, at least in part, to the obstacles encountered by NGOs in the field: greater needs, fewer resources, poor coverage of and adherence to interventions and their fragile sustainability. For Link NCA studies, documenting the implementation and follow-up of community recommendations is paramount if the sector is to meet these aims.

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⁴ https://interagencystandingcommittee.org/system/files/iasc_aap_psea_2_pager_for_hc.pdf

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Ending the marketing of breastmilk substitutes: An amazing push to increase breastfeeding rates



This article describes recent initiatives that were taken to better regulate the marketing of breastmilk substitutes so that mothers can choose how to feed their children based on the best information and evidence, influenced only by what is best for the child and parents and not by commercial interests.



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Background

The evidence is clear: breastfeeding is the best possible source of nutrition for infants. For decades, although research has consistently shown the benefits of breastmilk for growth, the prevention of infections, bonding and the brain development of children as well as the health benefits for mothers, breastfeeding rates remain suboptimal.

In 2012, the World Health Assembly (WHA) Resolution 65.6 specified that the rate of exclusive breastfeeding in the first six months of a child should increase up to at least 50% by 2025. However, globally only 41% of infants under six months of age are exclusively breastfed to date (WHO, 2022a).

The decisions and practices around infant feeding are influenced by several factors including the promotion and support that mothers receive. The impact of formula milk marketing on infant feeding decisions and practices is well known

“As detailed in this report, formula milk marketing – powered by enormous budgets and the deliberate misuse of science – is driving over-consumption of formula milk and discouraging breastfeeding”

– quote from the Forward of the report by the Director General of WHO and the Executive Director of UNICEF

too and, since 1981, the International Code of Marketing of Breastmilk Substitutes (the Code) was passed by the WHA as a landmark public health agreement to regulate the marketing of breastmilk substitutes (BMS). Yet, 40 years on, formula milk marketing still represents one of the most underappreciated risks to infants' and children's health. The consequences for the health and human rights of women and children are not new, but they are often overlooked.

The marketing of formula milk influences our decisions on infant feeding

Marketing is part of everyday life, experienced by virtually everyone. In a report published in early 2022 (WHO, 2022b), the World Health Organization (WHO) highlighted that the marketing of foods predominantly promotes foods that contribute to unhealthy diets (such as 'fast food', sugar-sweetened beverages and chocolate and confectionery) and uses a wide range of creative strategies likely to appeal to young audiences (such as celebrity/sports endorsements, promotional characters and games). This report confirms that the marketing of foods that contribute to unhealthy diets remains pervasive and persuasive and provides evidence that strengthens the rationale for action to protect children from exposure to harmful food marketing practices.

When it comes to the marketing of BMS, for example, formula milk products, this is even more serious as the feeding practices of children in the first three years of life profoundly affect their survival, health and development throughout their lives. Deciding on how we feed our infants and children should therefore be based on robust information and evidence influenced only by what is best for the child and parents and not by commercial interests. The poorly regulated marketing of formula milk products is therefore a significant concern for the health and well-being of children globally.

A new report shows that formula milk marketing is pervasive, often misleading and tackles the pain points that women face

Earlier this year, the WHO and UNICEF revealed the results of a multi-country study on the marketing of breastmilk substitutes (WHO & UNICEF,

2022). The study heard directly from women and those who influence them – health professionals, partners, family members and friends – about their exposure to and experience of formula milk marketing. Eight countries were included in the study – Bangladesh, China, Mexico, Morocco, Nigeria, South Africa, the United Kingdom and Vietnam. These countries were representative of countries in their regions yet were diverse in their income levels, exclusive breastfeeding rates and implementation of the Code. The study was conducted in urban populations where trends and values about infant feeding practices are established and spread to other communities.

Grounded in the experiences of over 8,500 women and 300 health professionals, the report exposed the aggressive marketing practices used by the formula milk industry and highlighted the impacts on families' decisions about how to feed their babies and young children.

The research findings (Box 1) show that formula milk companies use sophisticated techniques and misleading messaging to market their products including scientific language and imagery, pain points and emotional and aspirational appeals. They also assume a friendly, supportive role to pregnant women and mothers, exploiting vulnerabilities to gain access and increase sales.

Most women surveyed (93%) had seen promotions for formula milk online or in a store and 68% of survey respondents had received a promotion for formula milk. Digital marketing practices have grown rapidly in recent years, especially in light of the COVID-19 pandemic. For example, in China, 68% of survey participants recalled seeing a pop-up advert for BMS on social media. Digital marketing was generally cited as more effective than traditional methods of advertising, being more precise in its targeting and requiring less investment. Furthermore, digital marketing provides formula milk companies with a rich stream of personal data that they use to sharpen and focus their marketing campaigns.

Across all the countries included in the survey, women expressed a strong desire to exclusively breastfeed, ranging from 49% of women in Morocco to 98% in Bangladesh. However, this was counterbalanced by a sustained flow of misleading marketing messages that the report showed reinforced myths about breastfeeding and breastmilk and undermined women's confidence in their ability to breastfeed.

The evidence that emerged from this study is strong: formula milk marketing (not the product itself) disrupts informed decision-making and undermines breastfeeding and child health.¹

The release of the report has already triggered actions...

Government officials, civil society, the health workforce, the private sector, community representatives, nutritionists, international humanitarian practitioners, etc. participated in the launch of the report on February 23rd, 2022. Two sessions were held to account for different time zones and included prestigious panels of speakers from national governments, human rights groups, civil society organisations and marketing experts. Several thousand people participated and heard that, despite the Code and the subsequent relevant WHA resolutions, formula milk companies continue to put sales and shareholder interests before infant and population health and continue to employ ever evolving tactics to both defy and circumvent regulations.

Both the events and the subsequent media coverage around the launch of the report triggered actions: the President of Ireland issued a statement following the launch of the report,² the traffic on social media, using the hashtag #EndExploitativeMarketing, increased and the open letter that was disseminated registered over 4,000 signatures in just a few days.³

“It is also undermining women’s confidence and cynically exploiting parents’ instinct to do the best for their children.”

– quote from the Forward of the report by the Director General of WHO and the Executive Director of UNICEF

... and offers the potential for again more opportunities for action

Based on strong evidence from the research findings, the report proposed opportunities for action, summarised in Box 1, which call for programming that supports mothers and those who influence them – close family members, health workers, friends – to make appropriate decisions about how to feed their infants and children. Deciding how to feed our infants and children should be based on reliable information and truthful evidence, influenced only by what is best for the child and parents and free of commercial interests.

This reports also gives the opportunity for health and nutrition practitioners to learn from the field of marketing. Do we properly respond to the needs of mothers? Do we appropriately tailor our messages to the challenges mothers face? Do new mothers have access to immediate support when they face a breastfeeding constraint? How do we make sure we provide appropriate support that make new mothers feel that ‘they can make it’ at a time they feel vulnerable? In humanitarian settings and conflict-affected areas,

Box 1 Key finding and opportunities for action from the WHO-UNICEF report

Key findings:

- Formula milk marketing is pervasive, personalised and powerful.
- Formula milk companies use manipulative marketing tactics that exploit parents’ anxieties and aspirations for having a healthier and brighter child, for example.
- Formula milk companies distort science and medicine to legitimise their claims and push their product.
- Industry systematically targets health professionals – whose recommendations are influential – to encourage them to promote formula milk products.
- Formula milk marketing undermines parents’ confidence in breastfeeding.
- Countermeasures can be effective but must be comprehensively expanded and scaled up.

Opportunities for action:

- Recognise the scale and urgency of the problem
- Legislate, regulate, enforce, which means that countries should urgently adopt or strengthen comprehensive national mechanisms to prevent formula milk marketing, including through their domestic legislation – health, trade and labour – in line with the Code, closing all loopholes, robust enforcement and accountability mechanisms including holding formula milk companies accountable for their practices and commitments, regulatory measures including plain packaging for formula products and higher standards of evidence for product development and programmatic initiatives such as strengthening and expanding the Baby-friendly Hospital Initiative
- Protect the integrity of science and medicine – including by setting mechanisms to prevent conflict of interest and to counter commercially driven messages on infant feeding
- Safeguard children’s health on digital platforms
- Invest in mothers and families, divest from formula milk companies
- Expand coalitions to drive action

when the life-saving potential of breastfeeding is even more crucial, how can we ensure that women are supported when they are even more vulnerable and worried about their ability to properly feed their children?

Conclusion

This report provides strong evidence of the pervasive and exploitative nature of infant formula marketing and is the call to action for all of us to do more to protect children adequately. It is based on what is often overlooked: the voices of mothers who are the primary target of marketing at a vulnerable and intimate time of their lives.

Some women choose not to breastfeed for a variety of reasons and should be supported in whatever decisions they make. However, this report highlights that marketing plays a critical role in women’s decision making on how they feed their infants. Across all the countries included in the survey, women expressed a strong desire to breastfeed exclusively, yet the report details show that a sustained flow of misleading marketing messages reinforces myths about breastfeeding and breastmilk and undermines women’s confidence in their ability to breastfeed.

Learning that the formula milk industry is investing USD 55 billion in marketing each year – which represents a larger budget than the WHO has available for its entire operations for two years – we realise that the public health sector is not equipped to reverse the trends by using the same tactics. It must use its own strengths as an alternative tool: ensuring robust enforcement and accountability mechanisms, including holding formula milk companies accountable for their practices and commitments, ensuring that health professionals are sufficiently trained to provide the necessary support to young mothers and investing in systems that prevent them from engaging in conflicts of interest.

Let us hope that this is only the beginning of a new era when mothers can choose how they feed their infants based on informed choice, free from commercial influence. Let us also hope that this is only the start of a conversation, as wished for by the WHO and UNICEF, in which health and nutrition practitioners engage and act.

If you would like to act now, please read and sign the open letter to #EndExploitativeMarketing

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¹ WHO and UNICEF recommend banning the harmful promotion and marketing of formula milk. WHO, UNICEF and the Code do not aim to limit access to formula milk products. Restricting marketing does not mean that formula milk products cannot be sold or that factual and scientific information about them cannot be made available to health professionals or families, nor does it restrict parents’ choice. It aims to make sure that parents are free to make choices that are based on accurate information while protecting them from misleading or biased marketing claims.

² <https://president.ie/en/media-library/news-releases/statement-by-president-michael-d-higgins-sabina-higgins-following-the-launch-of-who-unicef-on-the-effects-of-marketing-of-infant-formula>

³ <https://www.who.int/teams/maternal-newborn-child-adolescent-health-and-ageing/formula-milk-industry/endexploitative-marketing-of-formula-milk-products>

The rationalisation of nutrition services in Rohingya camps in Cox's Bazar

This article outlines the provision of nutrition services in Cox's Bazar, an area where multiple partners work together to deliver to those in need in the refugee population. At times, this can result in duplication, double counting and gaps in service provision



Nutrition counselling at 'Camp 10' integrated nutrition facility, Cox's Bazar, Bangladesh



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Information Technical Working Group.

The authors acknowledge all sector partners' kind contributions to the work described in this article. Sector partners include the Government of Bangladesh, United Nations programme partners (namely, the World Food Programme, UNICEF and the United Nations High Commissioner for Refugees), international and Bangladesh non-governmental organisations, donors and other nutrition sector members in Cox's Bazar. Special thanks to all site supervisors of the integrated nutrition facilities for adopting the COVID-19-modified nutrition protocols and for continuing to run the facilities despite the challenges brought about by the COVID-19 pandemic.

COX'S BAZAR, BANGLADESH

Key messages:

- In 2019, nutrition sector partners proposed and conducted a nutrition service rationalisation process. As a result, since January 2020, all nutrition services in each camp are provided through integrated nutrition facilities with a complete package of globally recommended nutrition services for children under five years of age and pregnant and lactating women.
- When exploring the impact of this process, coverage of nutrition screening increased from 66.4% to 93.8% from 2018 to 2020 while the prevalence of severe wasting decreased. Programme quality data (as evidenced through cure and death rates) did not show any negative impact and defaulter rates reduced substantially.
- As a next step for this work, an evaluation will be conducted to explore the qualitative impact of the rationalisation process, both on service providers and beneficiaries.

Background

Cox's Bazar District currently hosts over 889,400 Rohingya refugees, nearly all of whom live in 34 congested refugee camps.¹ Out of the total population, there are 160,544 children under five years of age, 124,517 adolescent girls (10-19 years old) and 42,000 pregnant and lactating women (UNHCR, 2020). Guided by the Humanitarian Needs Overview (HNO) and Joint Response Plan (JRP), multiple partners work together to provide nutrition services to those in need in the refugee population, coordinated by the Government of Bangladesh and the UNICEF co-led nutrition sector. Since 2020, all nutrition services have been provided through 46 integrated nutrition facilities (INF), including outpatient therapeutic programmes (OTP) for the treatment of severe wasting, targeted supplementary feeding programmes (TSFP) for the treatment of moderate wasting and blanket supplementary feeding programmes

¹ For more background and institutional arrangement of the nutrition responses in Cox's Bazar, please refer to:
<https://www.enonline.net/fex/62/myanmarnationalsinbangladesh>
<https://www.enonline.net/fex/63/cmamcxcovid19adaptations>
<https://www.enonline.net/fex/61/nonbreastfedinfantsrohingya>

(BSFP). In addition, maternal, infant and young child feeding (MIYCF) counselling is provided through these nutrition facilities, using both one-on-one and small group sessions (adhering to social distancing regulations and broader modifications as a result of the COVID-19 pandemic). Adolescent girls and pregnant and lactating women (PLW) are targeted with iron and folic acid (IFA) supplementation. Vitamin A supplementation campaigns for children under five years of age are run in the camps twice a year.

Annually, nutrition sector partners provide OTP services to almost 12,000 children under five years of age with severe wasting and TSFP services to over 46,000 children under five years of age with moderate wasting. In addition, over 145,000 children under five years of age and 42,000 PLW are reached with BSFP monthly. The anaemia prevention programme distributes IFA to 112,000 adolescent girls and 38,000 PLW. The MIYCF counselling sessions reach almost 3,000 PLW, mothers and caregivers of children under five years of age monthly.

Nutrition service arrangements

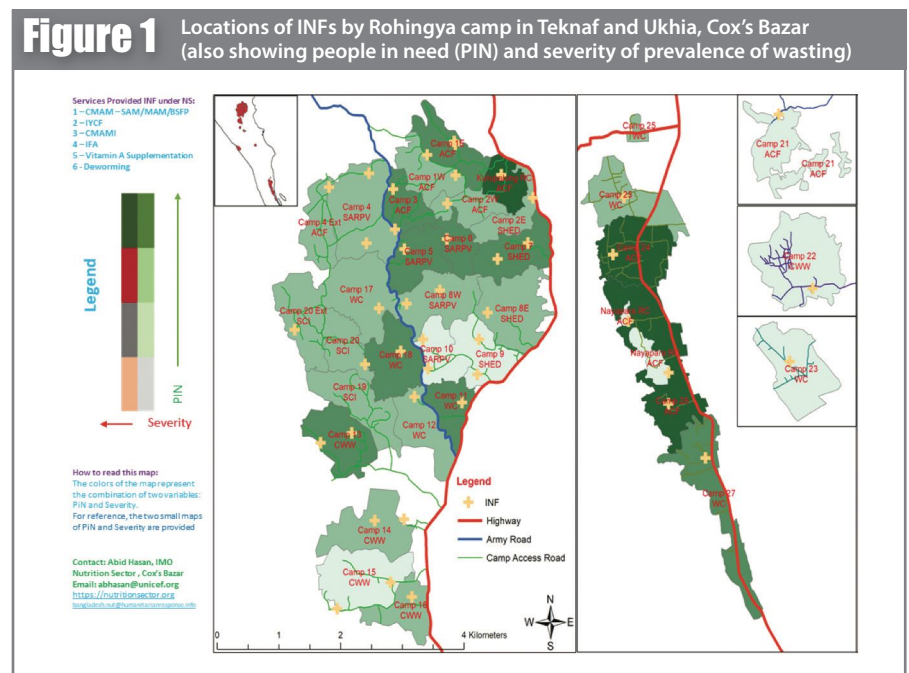
Prior to 2019 and the nutrition sector rationalisation process, there were 84 scattered OTP, TSFP and BSFP programmes in the camps. Nutrition services were supported by different United Nations (UN) agencies and implemented by different implementing partners (non-governmental organisations (NGOs)) with the location of these partnerships across camps scattered and, in some cases, illogical with catchment areas not clearly defined. This resulted in gaps, overlaps and duplication in both the provision of services and in reaching targeted beneficiaries. The nutrition sector partners therefore proposed a nutrition service rationalisation process which was completed by the end of 2019.

As a result, since January 2020, all facilities and partnerships providing nutrition services are split by camp with a single INF providing a complete package of globally recommended nutrition services for children under five years of age and PLW through a 'one-stop shop' with community-based management of acute malnutrition (CMAM) (OTP and TSFP) and MIYCF services at the core. The nutrition sector maintains at least one INF per camp, with some camps having a satellite nutrition facility to serve larger catchment populations, resulting in a total of 46 INFs across the 34 Rohingya camps (Figure 1). INFs are coordinated and managed by the site supervisors and respective NGO staff who report to the nutrition sector as per the HNO and JRP targets.

This article describes the early results of the nutrition service rationalisation process, the observed challenges and the lessons learnt to demonstrate the utility of this approach in terms of coverage and the overall performance of nutrition services.

The process of nutrition service rationalisation

The nutrition service rationalisation process was long and, at times, difficult. It required a strong

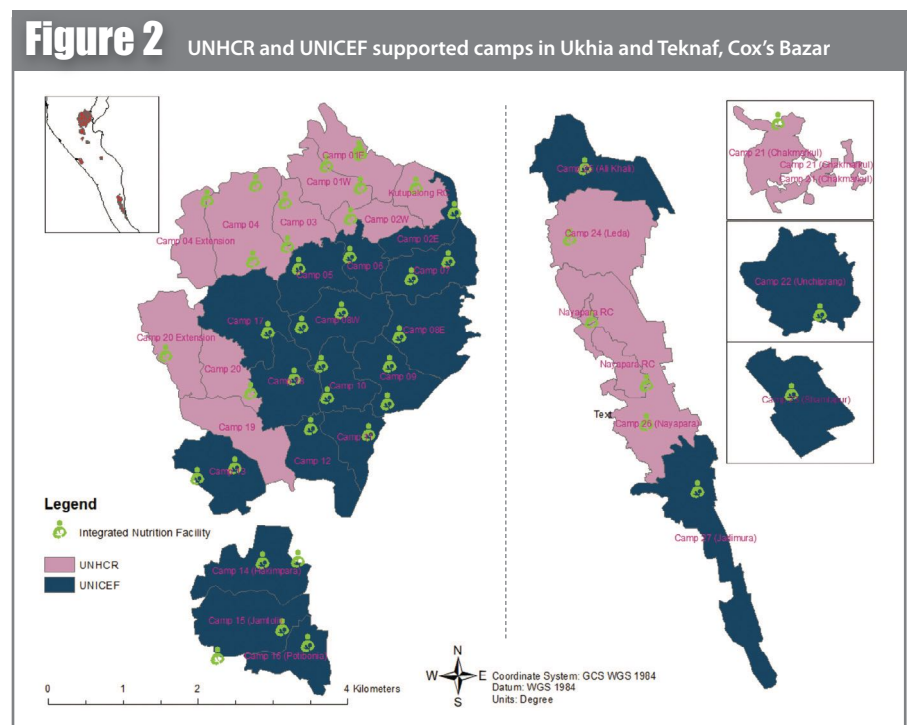


commitment from UN, government and implementing (NGO) partners to cooperate and work together. Nutrition sector meetings were the platform for discussions and communication on the rationalisation process between all stakeholders. As a first step, all UN partners had to agree to retain only one nutrition site in each camp, with the largest nutrition facility within each camp selected to bring all nutrition services under a single roof. Nutrition services at smaller centres discontinued and these facilities were repurposed for other activities, including storage.

As the World Food Programme (WFP) was the only UN partner supporting TSFP and BSFP activities, they continued to provide these nutrition services in all camps. For OTP services, UNICEF and the United Nations

High Commissioner for Refugees (UNHCR) geographically split the locations based on agreed criteria including the average estimated cost of running the nutrition facility combined with the respective UN agencies' annual budget and the number of active partnerships with implementing partners (Figure 2). As a result of this process, WFP supports all 34 camps with TSFP and BSFP services while UNHCR supports 14 camps and UNICEF supports 20 camps with OTP services.

Implementing partners were allocated to each INF through mutual agreement depending on their experience, existing capacity and the financial resources available. The final documentation outlining who would be responsible for what service



Box 1 Indicators used to assess coverage and performance

- Proportion of children under five years of age screened for malnutrition (out of the total number of children under five years of age in the camp population per year).
- Proportion of wasted children (severe and moderate) out of the total number of children screened per year.
- The proportion of cured, defaulted or deceased cases among children under five years of age admitted in CMAM programmes.
- Average number of MIYCF counselling sessions received by caregivers of children classified as being wasted.

and where was initiated by the implementing partners, submitted to the nutrition sector and finally approved by the Refugee, Repatriation and Relief Commissioner in Cox's Bazar.

A more complete process of the nutrition service rationalisation process will be described in future Field Exchange publications once the process has evolved further.

Programmatic results of the nutrition service rationalisation process

To understand the direct and indirect impact of the nutrition service rationalisation process, we compared the coverage of nutrition services and the key performance indicators from 2018

to 2020. The key indicators used to assess coverage and performance (Box 1) are drawn from nutrition sector reports.² The results are provided in Table 1.

Coverage of wasting screening

Between 2018 and 2020, the geographic coverage of community wasting screening increased from 66.4% to 93.8% despite a drop to 57.7% in 2019 – a year when the sector partners worked to avoid duplicating services and counting the same beneficiaries at multiple sites (known as double counting). Almost all children under five years of age were reached for wasting screening following the nutrition service rationalisation process (Figure 3).

Proportion of wasted children out of those screened

Among children under five years of age screened for wasting, the proportion of those identified with severe wasting reduced considerably from 2.4% in 2018 to 0.6% in 2020. However, the proportion of children under five years of age screened and identified with moderate wasting did not vary from before and after the nutrition service rationalisation. It remained at around 3% in 2020, the same proportion reported in 2018 (Figure 4).

CMAM programme performance indicators

CMAM programme performance indicators (cure, defaulter and death rates) either improved or remained stable following the nutrition service rationalisation. The cure rates for children

treated for either severe or moderate wasting were consistently above the recommended Sphere standard of 75%. In relation to severe wasting cure rates, comparisons from 2018 to 2020 showed a slight decrease from 96.6% in 2018 to 90.3% in 2020 while moderate wasting cure rates increased during the same time period from 78.4% in 2018 to 91.2% in 2020. Defaulter rates reduced in OTPs from 1.9% in 2018 to 0.4% in 2020 and in TSFPs from 14.6% in 2018 to 0.7% in 2020. Death rates for children treated for either severe or moderate wasting were also consistently lower than Sphere standards at less than 1% across the three-year time period. This appeared to be relatively independent of seasonal influences and other emergencies such as the COVID-19 pandemic.

MIYCF counselling

The coverage of the MIYCF counselling programme increased with the rationalisation of nutrition services. The number of counselling sessions held with caregivers of children with severe wasting (either through group sessions or one-on-one counselling) increased almost five-fold from an average of one session in 2018 to 4.9 sessions in 2020. This takes into account the exclusion of double counting after service rationalisation. However, MIYCF counselling sessions given to caregivers or mothers of moderately wasted children showed a different picture. The average number of MIYCF counselling sessions received increased to 2.3 times that of 2018 in 2019 but in 2020 was only 1.4 times that of the 2018 rates.

Discussion

The nutrition service rationalisation led to many improvements in nutrition service provision in Cox's Bazar. The double counting of beneficiaries and the duplication of services were reduced, as indicated by the improved coverage of nutrition screening and reduced defaulter rates. Beneficiary convenience was increased as there was no longer a need to search for appropriate nutrition services at a number of different facilities. Overall, the demarcation of the UN partners' programmatic accountability by camp increased the level of emergency preparedness and responsiveness as implementing partners felt more ownership of nutrition services in their allocated locations. It also prevented the duplication of financial resource allocation from different agencies for the same services and activities.

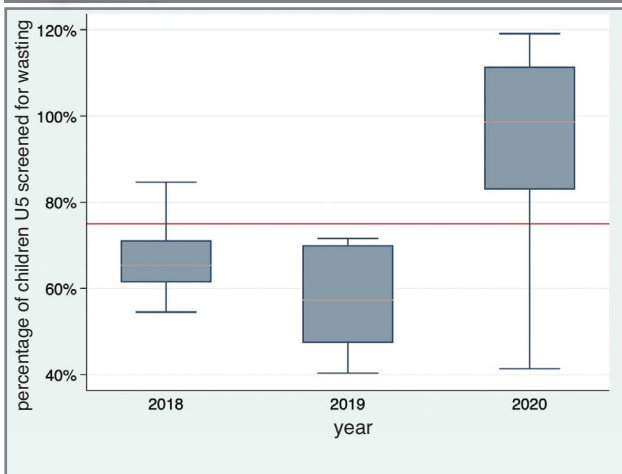
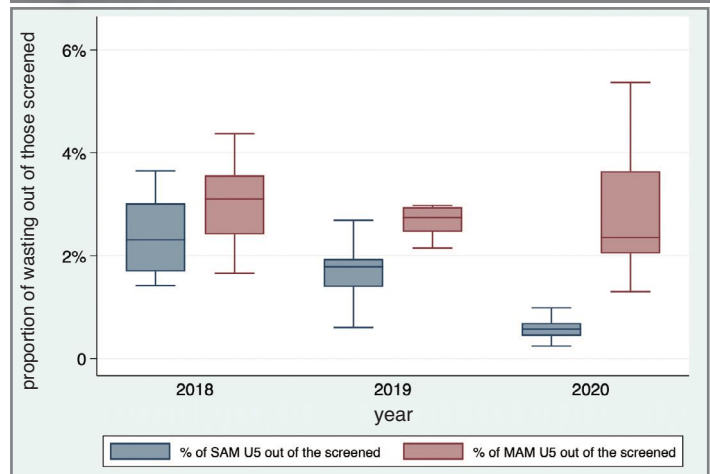
The proportion of children identified with severe wasting dropped significantly from 2018 to 2020 which is likely due to the improved performance of the INFs and increased community screening within the catchment population, as well as the timely adoption and dissemination of COVID-19 CMAM protocol modifications for earlier identification of cases of wasting. The proportion of children with

Table 1 Comparison of CMAM and MIYCF programme indicators by year

Indicators	2018-2020 average	2018	2019	2020
Proportion of children screened for wasting	72.6%	66.4%	57.7%	93.8%
		61.6-71.69	50.45-64.86	78.84-108.77
Proportion of children identified and admitted with severe wasting out of total number of children screened	1.6%	2.4%	1.7%	0.6%
		1.91-2.83	1.34-2.03	0.46-0.72
Proportion of children identified and admitted with moderate wasting out of total number of children screened	2.9%	3.0%	2.8%	3.0%
Cure rate among children with severe wasting in CMAM programme	92.7%	96.6%	91.1%	90.3%
Default rate among children with severe wasting in CMAM programme	1.0%	1.9%	0.7%	0.4%
Death rate among children with severe wasting in CMAM programme	0.2%	0.1%	0.2%	0.2%
Cure rate among children with moderate wasting in CMAM programme	86.6%	78.4%	90.1%	91.2%
Default rate among children with moderate wasting in CMAM programme	6.2%	14.6%	3.2%	0.7%
Death rate among children with moderate wasting in CMAM programme	0.2%	0.1%	0.2%	0.5%
Average number of MIYCF counselling sessions for caregivers of children with severe wasting		1*	3.0	4.9
Average number of MIYCF counselling sessions for caregivers of children with moderate wasting		1*	2.3	1.4

* 2018 is taken as a baseline and compared with the following results in 2019 and 2020. For example, counselling sessions for the caregivers of children with severe wasting were given 4.9 times more than in 2018.

² Reports were drawn from the 4W platform. 4W is a reporting tool of the Joint Response Plan (JRP) under the general coordination of the Inter-Sector Coordination Group (ISCG) in Cox's Bazar. 4W reports were compiled monthly and consolidated in the annual JRP monitoring and reporting frameworks.

Figure 3 Wasting screening coverage from 2018 to 2020**Figure 4** Proportion of severe and moderate wasting in children screened from 2018 to 2020

moderate wasting did not decrease over the same time period which calls for an increased need to focus efforts on the prevention, as well as treatment, of wasting moving forward. Treating moderate wasting effectively with a good level of coverage would lead to a reduction in the prevalence of severe wasting but ultimately comprehensive context-specific prevention of wasting services are needed to reduce the overall prevalence of wasting.

It appears that the rationalisation process did not negatively impact nutrition service quality. Looking at CMAM programme performance indicators, all three indicators (cure, defaulter and death rates) provide evidence of sustained high-quality OTP and TSFP services throughout the pandemic and the rationalisation process. However, MIYCF programme coverage for children admitted to the TSFP programme fell in 2020 although this is likely a direct result of nutrition protocol modifications in response to the COVID-19 pandemic rather than as a result of the rationalisation process. The MIYCF programme shifted from group to individual sessions and prioritised counselling in OTPs rather than TSFPs. There is a need to refocus efforts on MIYCF counselling for cases of moderate wasting moving forward as COVID-19 restrictions are eased.

Adaptations to the COVID-19 pandemic

The nutrition service rationalisation process proved very timely as it was implemented shortly before the onset of the COVID-19 pandemic. Due to COVID-19, restrictions on moving staff in and out of camps were imposed resulting in available staff numbers being reduced by over half. Having integrated and rationalised services allowed the nutrition sector to continue to provide all services (OTP, TSFP and BSFP) despite the reduced staff numbers. Furthermore, as a result of limited access to the camps, sector partners engaged in a process of building the nutrition capacity of Rohingya nutrition volunteers, particularly in relation to the screening of children. This has enabled more sustainable and community-led programming as a result.

COVID-19 modifications to the nutrition protocol were also put into place, including expanding mid-upper-arm circumference (MUAC) cut offs and rolling out the mother-led MUAC approach (Dube et. al., 2020; Miah et al., 2020). While comparisons between 2018 and 2020 do not reflect these changes, it was noted that these adaptations had a substantial impact on admissions to nutrition services from March 2020 (Dube et. al., 2020). From May 2020, the nutrition sector implemented the mother-led MUAC approach and, since then, over 130,000 caregivers and mothers of children under five years of age have been trained in the use of MUAC.

Limitations

We were not able to analyse the cost-efficiency of the rationalisation process due to the limited availability of financial information. It would be interesting to explore the cost benefits of such a process and understand the financial and human resource implications of the rationalisation process. Broadly speaking, the process did not appear to result in any additional needs and this was demonstrated by the COVID-19 pandemic requiring no further human or financial resources from the nutrition sector, yet quality of programming was still maintained. However, accurate data on this would be useful to inform similar exercises in other contexts.

Another limitation to this process was the lack of qualitative data on the impact of the rationalisation. While the quantitative data available highlights positive impact, it would be valuable to understand more about the nuances of the process and the feedback of those involved as well as the beneficiaries. With funds received from European Civil Protection and Humanitarian Aid Operations in 2021, the nutrition sector is planning to conduct an evaluation of the nutrition sector response in the Rohingya camps. The evaluation will focus on beneficiaries and service providers' perceptions of the quality and comprehensiveness of nutrition services before and after the sector rationalisation. The qualitative results of the evaluation will be compared and combined with the quantitative results outlined in this article. The authors plan to summarise and publish these combined findings in a subsequent article in Field Exchange.

Conclusion

Only one year has passed since the introduction of the nutrition service rationalisation. The sector partners aim to continue documenting and reporting the changes resulting from the rationalisation process and reflect on the lessons learnt. Programmers in humanitarian and development contexts should consider conducting a nutrition service rationalisation process to bring all nutrition services together under one roof given the positive impact relating to programme coverage and service quality. The concept of a 'one-stop-shop' is not new but only a limited number of countries have restructured nutrition services and united OTP, TSFP and BSFP programmes together. Nutrition service rationalisation is recommended as it not only provides an opportunity to integrate health and nutrition services, it also supports a disability-friendly environment and allows the mainstreaming of gender and protection services through a single programme.

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Using routine data for nutrition accountability: Experience from the Nigeria Governors' Forum Nutrition Scorecard

This article outlines the use of a nutrition scorecard in Nigeria that, in addition to enabling environmental indicators, includes nutrition outcome indicators drawn from HMIS/DHIS2 which is a critical source for routine nutrition data at the sub-national level

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NIGERIA

Key messages:

- The Nigeria Governors' Forum scorecard is presented to the Governors semi-annually and so to ensure updated information, nutrition outcome indicator data is drawn from HMIS/DHIS2 reports.
- In this article, we describe the challenges encountered in the process of using HMIS/DHIS2 indicators, namely the absence of data on community-level nutrition services, the lack of age-disaggregated data to estimate denominators, data quality issues, and the delay in printing and distribution of updated registers and reporting forms that include new nutrition indicators.
- While these challenges are not unique to Nigeria, we share our experiences and provide recommendations to encourage further investment in monitoring, especially for data quality improvement and to encourage the use of routine data.

Background

Nigeria recently approved its National Multi-Sectoral Plan of Action for Food and Nutrition 2021-2025 which aims to reduce the rate of stunting among children under five years old from 31% to 18% and increase the rate of exclusive breastfeeding from 28% to 65% (Reliefweb, 2021). This ambitious agenda requires strong support from the Governors of Nigeria's 36 states.

The Nigeria Governors' Forum¹ is a non-partisan platform that regroups all 36 Governors in the country. The platform uses data to inform the decision-making of Nigeria's Governors to promote good governance and development efforts. Scorecards have been used in the past to promote the Governors' engagement on issues such as polio eradication and state-supported health insurance schemes.

In 2019, the Nigeria Governors' Forum Secretariat decided to develop a similar

tool for nutrition to track state-specific progress against the commitments made by the Governors to foster enabling environments for nutrition action. Those four commitments were:

1. Set up or revitalise State Committees on Food and Nutrition
2. Establish state-specific multi-sector plans of action on nutrition
3. Increase budgetary spending on nutrition interventions
4. Promote maternity protection for civil servants

Between 2019 and 2021, the Nigeria Governors' Forum Secretariat collaborated with Data for Decisions to Expand Nutrition Transformation (DataDENT²), an initiative funded by the Bill & Melinda Gates Foundation that focuses on strengthening the global and national data value chain for nutri-

¹ <https://nnggovernorsforum.org/>

² <https://datadent.org/>

Figure 1 Visualisation of the nutrition scorecard

Data Source	Data provided by Stste Committees on Food and Nutrition (SCFN)						Routine/Administrative data	
Indicator	SCFN quarterly meeting chaired by SCFN Chair (Apr-Jun 2011)	75% of quarterly funding for SCFN released (Apr-Jun 2011)	MSPAN approved	State list of prioritised programmes shared	Six Months maternity leave with full pay for civil servants	Functional government owned/run creche9s0	US SAM coverage (DHIS-2 Apr-Jun 2021 average) Target:75%	
state A							0%	
state B							5%	
state C							0%	
state D							10%	
state E							3%	

tion. Other stakeholders were engaged including the Federal Ministry of Budget and National Planning, Alive and Thrive, Civil Society – Scaling Up Nutrition in Nigeria (CS-SUNN), Save the Children, and UNICEF to design and implement a nutrition scorecard (Rana et al, 2021).

The nutrition scorecard, shown in Figure 1, was launched in 2021 as an advocacy, accountability and monitoring tool to track state-specific progress against the four commitments made by the Governors. The scorecard is presented semi-annually to the Governors of each state.

In addition to the indicators on the four commitments, the nutrition scorecard also includes an outcome indicator so that the Governors are sensitised to the overall nutrition situation in their respective states. Given that the nutrition scorecard is updated at the sub-national level semi-annually, the outcome indicators are drawn from the health management information system (HMIS)/district health information software (DHIS2) reports. The challenges to using such administrative data are well-documented and include incomplete and inaccurate reporting, a shortage of data collection instruments, and limitations to estimating target populations for denominators (Agiraembabazi et al, 2021; Maina et al, 2017).

In this article, we describe the challenges encountered in the process of selecting nutrition outcome indicators for the Nigeria Governors' Forum nutrition scorecard and highlight recommendations for improving the usability of the HMIS/DHIS2 data for similar purposes.

Process to select nutrition outcome indicators for the nutrition scorecard

The DHIS2 is a web-based software system that was adopted by Nigeria in 2010 to facilitate the

collection and analysis of health data (Shuaib et al, 2020). Data is sourced from the national HMIS. All health facilities across the country complete a monthly summary form (NHMIS-001)³ using the data recorded in the facility-level HMIS registers. They then share these statistics up administrative levels via the DHIS2 web platform. Reporting rates, measured by the com-

pleteness of the NHMIS-001 form for all health facilities, are generally high: 76.2% in 2017, 80.6% in 2018, 86.2% in 2019 and 81.9% in 2020.

The Nigeria Governors' Forum and Data-DENT teams worked together to select outcome indicators derived from DHIS2 data using a four-step process:

Table 1 Comparison of CMAM and MIYCF programme indicators by year

2013 Indicators	2019 Indicators
# of children 0-59 months weighed – total	# of children 0-59 months who received Nutrition/Growth Monitoring & Promotion Services**
# of children 0-59 months weighing below the bottom line	# of children 0-59 months who are growing well**
# of children 0-6 months reporting being exclusively breastfed	# of children 0-6 months receiving EBF
# of children 6-11 months given vitamin A	# of children 6-11 months given vitamin A
# of children 12-59 months given vitamin A	# of children 12-59 months given vitamin A
# of children 12-59 months given deworming medication	# of children 12-59 months who received deworming medications
# of children <5 placed on treatment for severe acute malnutrition (OTP & SC)*	# of children <5 admitted for treatment of SAM (new/transferred)
# of children <5 discharged (as healthy) from treatment for severe acute malnutrition (recovered)*	# of children <5 treated for SAM (treatment outcomes) recovered/defaulted/dead/transferred out**
# of children admitted into CMAM Programme	# of confirmed under-5 deaths due to malnutrition**
# of children defaulted from CMAM Programme	
	# of pregnant women counselled on maternal nutrition during ANC**
	# of pregnant women with severe anaemia**
	# of diabetes mellitus new cases**
	# of clients counselled on infant and young child nutrition (IYCN)**
	# of babies put to breast within 1 hour with skin-to-skin to keep warm**
	# of children 6-23 months given MNPs**
	# of diarrhoea new cases <5**

*Indicator removed or modified in the 2019 version **Indicator newly introduced in the 2019 version

Acronyms used stand for: OTP: outpatient therapeutic care, SC: stabilisation centre, CMAM: community-based management of acute malnutrition, EBF: exclusive breastfeeding, SAM: severe acute malnutrition, ANC: antenatal care, IYCN: Infant and young child nutrition, MNP: micronutrient powder.

³ The NHMIS Form 001 Health Facility Summary form is one of the several forms available on the DHIS2 platform with sections on Health Facility Attendance, Maternal Health, Pregnancy Outcomes, Immunisation and Nutrition.



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1. First, the monthly summary form and the online DHIS2 dashboard were reviewed to identify available nutrition data elements. The 2013 version of the monthly summary format was updated in 2019 with several new or revised nutrition indicators (Table 1). However, when the scorecard was designed, only six states – Benue, Delta, Imo, Kaduna, Nasarawa and Oyo – had rolled out the 2019 form. We therefore decided to only consider including indicators from the 2013 form into the nutrition scorecard.
2. Next, for all the nutrition indicators available, the team downloaded monthly state-level data for the period January 2019 to November 2020. They reviewed the monthly trends, noting anomalies such as coverage indicators that had values greater than 100%.
3. The team then narrowed down the list of potential indicators based on 1) the completeness of the data for the given indicator, and 2) whether the indicator reflected nutrition outcomes for all children and not only for those who had sought care at facilities. The team specifically assessed whether denominators could be constructed to reflect trends at the state level.
4. Finally, the team confirmed with nutrition measurement experts and the HMIS/DHIS2 team in Nigeria that their proposed list of indicators was appropriate.

Indicators selected for inclusion in the nutrition scorecard

The team examined all the data elements available in the 2013 form as detailed in Table 2. After conducting that review, they settled on only one indicator – severe acute malnutrition (SAM) treatment coverage – because the data was generally complete for that indicator. The team also considered that this indicator could give an indication of the trends for all children. The calculation method, including how to determine both numerator and denominator, is provided in Box 1.

SAM treatment is almost exclusively delivered through health facilities, except in some emergency settings, so it was expected that the HMIS/DHIS2 system should capture most service delivery to populate the numerator. The denominator, calculated using census population projections and SAM prevalence from annual national surveys, estimates the number of all at-risk children. This indicator is calculated for each state and updated every quarter.

When defining the indicator's calculation method, the authors considered using the denominator 'Total Facility Attendance (0-59 months)' from the 2013 form. However, this was not used as, while all children who attend a facility might be screened for wasting, only those identified as severely wasted should receive SAM treatment. Instead, the authors chose to estimate the total number of suspected SAM cases (0-59 months) in each state and at a given time by using the state population estimates for children 0-59 months and multiplying these by the state-level SAM prevalence estimates from the 2018 Demographic and Health Survey (DHS) and the wasting incidence correction factor (Box 1).

Estimating SAM treatment coverage directly – using methods such as the Simplified Lot Quality Assurance Sampling Evaluation of Access and Coverage (SLEAC) or the Simple Spatial Surveying Method (S3M) – would be more precise, although such methods were not employed due to infeasibility at scale. Therefore, estimating the denominator was deemed appropriate, although this may have resulted in an overestimation of burden.

Limitations of using routine data

Challenges in using administrative data, such as those found in HMIS/DHIS2 systems, are not unique to the nutrition sector or to Nigeria. To encourage further investments in HMIS/ DHIS2 and overall data quality improvement, we reflected on some of the roadblocks encountered when using HMIS/DHIS2 indicators for the Nigeria Governors' Forum nutrition scorecard.

Community-level nutrition services may not be adequately captured

Nigeria's HMIS/DHIS2 system is not designed to capture community-level nutrition services. Several nutrition interventions in Nigeria are indeed commonly delivered through both facility and community-level platforms. For example, vitamin A supplementation and deworming can be given to children under five years of age in a health facility, but they are also frequently distributed through outreach campaigns, known as maternal, newborn, and child health (MNCH) weeks. The number of children reached with these services during these campaign activities is not consistently captured in the HMIS/DHIS2 systems; it may be reported through other channels. This means that, for example, to monitor the state-wide delivery of vitamin A and deworming, one cannot solely rely on a HMIS/DHIS2 indicator as the data would be misleading. For that reason, those indicators could not be considered for inclusion in the nutrition scorecard.

Age-disaggregated data to estimate denominators for some coverage indicators is not always available

The age-disaggregated data required to estimate denominators for some coverage indicators is not available in the HMIS/DHIS2 system. For example, in the case of the exclusive breastfeeding indicator that assesses the proportion of infants 0–5 months of age who are fed exclusively with breastmilk, the ideal denominator would be the total facility attendance of children aged 0–<6 months. However, the monthly facility reporting form only captures total facility attendance by newborns 0-28 days old and infants 0-1 years of age. There is no clear and reliable way to estimate the proportion of those who are under six months of age.

Data may have quality issues

Some indicators could not be used in the scorecard due to either too much missing data or the presence of anomalous results. For example, between July and September 2020, a state reported several months where the underweight prevalence spiked to up to 7700%. In 2020, we assumed missing data might have stemmed from the COVID-19 pandemic. There was,

BOX 1 SAM treatment coverage calculation method

$$\text{SAM treatment coverage} = \frac{\# \text{ Children 0-59 months on SAM treatment}}{\text{Estimated SAM burden}}$$

$$\text{SAM burden} = \text{Census projection of children 0-59 months} \times \% \text{ children WHZ} < -3\text{SD in annual survey} \times \text{wasting incidence correction factor}$$

Note on the wasting incidence correction factor: a recent study suggests that correction factors vary across geographies and that the previously recommended incidence correction factor of 1.6 would likely result in underestimates (Isanaka et al, 2020). Therefore, when available, researchers applied a state-specific correction factor. Otherwise, the Nigerian national level correction factor of 1.3 was used.

Table 2 List of potential indicators considered for inclusion in the nutrition scorecard

Indicator	Definition	Numerator (and source of data)	Denominator (and source of data)	Observation
SAM treatment coverage	The proportion of severely malnourished children who can access care for SAM at the health facilities	Children <5 years placed on treatment for SAM (HMIS/DHIS2 data)	Census projection of children 0-59m multiplied by % children WHZ<-3SD in annual survey (DHS 2018) multiplied by wasting incidence correction factor	This is the indicator included on the Nigeria Governors' Forum scorecard.
Vitamin A coverage	The proportion of children who receive age-appropriate doses of vitamin A in the last year	Children (12-59 months) who received vitamin A (from HMIS/DHIS2)	State population projections for children aged 12-59 months (from the 2006 census) multiplied by two (as there are two doses in a year)	This data element does not specify whether the children counted received one, two or several doses of vitamin A. There is thus a very high risk of duplicate and inappropriate counts. Also, vitamin A is delivered through multiple platforms.
Exclusive breastfeeding rate	The proportion of children who are exclusively breastfed in the first six months of life	Children 0-6 months receiving exclusive breastfeeding (from HMIS/DHIS2)	Facility attendance (0-1 years) – use the vaccine schedule to decide a percentage of visits to ascribe to 0-6 months	The ideal denominator, 'Facility attendance (0-6 months)', is not available.
Underweight	The proportion of children who weighed below the bottom line in the last year	Children (0-59 months) weighing below the bottom line (from HMIS/DHIS2)	Children (0-59 months) weighed (from HMIS/DHIS2)	Although all the data elements required to compute this indicator are available on HMIS/DHIS2, the indicator is no longer used by the nutrition community.
Deworming	The proportion of children 12-59 months who received deworming medication in the last year	Children (12-59 months) who received deworming medication (from HMIS/DHIS2)	Facility attendance (12-59 months) (from HMIS/DHIS2) multiplied by two (as there are two doses in a year)	The majority of deworming tablets are distributed during campaigns and campaign data is not regularly captured in HMIS/DHIS2.
SAM recovery	The proportion of children who are successfully treated for SAM	Children <5 years discharged healthy after nutritional treatment (from HMIS/DHIS2)	Children <5 years discharged from the programme i.e., cured + non-recovered + defaulted + death (from HMIS/DHIS2)	This indicator measures the outcomes of the SAM treatment programme but does not provide information on access to treatment.
Growth monitoring	The proportion of children whose growth is monitored at the health facilities	Children (0-59 months) weighed (from HMIS/DHIS2)	Facility attendance (0-59 months) (from HMIS/DHIS2)	This measures a routine nutrition activity without a clear association with an outcome, hence the decision to exclude.

however, a high number of '0' values for months in 2018 and 2019 which could not be explained.

Delay in the rollout of the 2019 monthly form and facility registers

As mentioned above, there were some delays in rolling out the 2019 monthly form and in updating facility registers. This meant that many potential nutrition indicators were not reported by most states. For example, only three out of 36 states had data for the indicator 'Children <5 admitted for treatment of SAM (new/transferred)'. Among the states that had updated to the 2019 form, there were also many reporting months that had missing data. The Nigeria Governors' Forum considered using projections to address the data gaps for some indicators in 2020 but this was not a viable option given the lack of historical data.

Recommendations

Given the challenges encountered, several recommendations were shared with the Federal Ministry of Health, which oversees the national HMIS. These recommendations may also be of relevance to those in other contexts who work with nutrition data from administrative systems such as the HMIS/DHIS2:

1. Consider how outreach services can be reflected in HMIS/DHIS2 reports. Options might include: 1) creating an MNCH week event in HMIS/DHIS2, or 2) aggregating data on the monthly reporting forms of the health facility implementing the MNCH week.
2. To estimate denominators, develop stan-

dardised catchment populations for age-specific nutrition services or consider establishing population-informed benchmarks for the absolute number of services delivered per month. For example, in Y state, we expect at least X total doses of vitamin A to be delivered per month.

3. Consider including denominator estimates derived from other data sources in the HMIS/DHIS2 system. For instance, we were able to calculate the denominator for the SAM treatment coverage indicator with minimal effort given other data available in the system.
4. Increase investment in facility-level data quality assessment and assurance activities – the focus should be around training on how to correctly extract and collate data from monthly forms and then enter the correct data into the HMIS/DHIS2 since it is difficult to edit post entry.

Conclusion

The HMIS/DHIS2 platform is a critical source for routine nutrition data in Nigeria, as in many countries. However, its utility for decision-making depends on improving the data quality, addressing information gaps and overcoming other shortcomings highlighted here. The Nigeria Governors' Forum health team will continue to use data from the HMIS/DHIS2 platform for state-level advocacy and further engage stakeholders at the Federal Ministry of Health around the necessity to improve the quality and reliability of the data of the platform. We believe

that data quality will improve when the data is actually used.

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For additional details, please read the following paper published through Gates Open Research in which the design team has outlined the process to develop the scorecard in greater depth: <https://gatesopenresearch.org/articles/5-98>

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Generalised oedema in COVID-19 positive children: A case series

Experiences on COVID-19 and nutrition captured to date in Field Exchange have been at a programme level rather than at individual case management level. To fill this knowledge-sharing gap, here we feature three case reports of generalised oedema in COVID-19 positive children in India that appeared to respond to nutrition treatment



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Key messages:

- Three cases of generalised oedema were seen in COVID-19 positive children and nutrition therapy with F-75 milk formula was associated with oedema resolution in all three cases.
- As the understanding of kwashiorkor to enable preventive and therapeutic interventions evolves, it is helpful to observe that mechanisms in kwashiorkor have much in common with the phenomena of oedema associated with other conditions.

Generalised oedema is an important clinical presentation in children and systemic causes are usual, namely renal, cardiac and hepatic as well as nutritional oedema in severe acute malnutrition (SAM). In this article we present three cases of COVID-19 positive children, from Mumbai and surrounding areas, with acute generalised oedema and without other signs of malnutrition or other systemic dysfunction. This clinical feature is rare and has not been described in literature worldwide (Sarangi et al, 2020).

Case 1

A 15-month-old female child was admitted with complaints of cold, cough and fever for five days and generalised oedema. The child was admitted with a weight of 11.38kg (weight for age Z-score and mid-upper arm circumference measurements were not taken due to the presence of oedema for each case) and tested positive for SARS COV 2 by RT-PCR test. On examination, the child was irritable and had generalised oedema but her vitals were normal. The child was not breastfeeding at admission nor during treatment duration. A complete blood count showed haemoglobin (Hb) at 8.7 g/dl, a total leukocyte count (TLC) of 12,520 mm³ and elevated C-reactive protein (CRP). Urine routine microscopy and culture were normal and blood urea nitrogen, serum creatinine and liver functions, including serum proteins, were normal. The chest X-ray and echocardiogram were normal. The presumptive diagnosis was iron-deficiency anaemia with generalised oedema with COVID-19 infection. The child was managed with antipyretics and azithromycin. Nutritional therapy with F-75 milk formula was started on day three post-admission as oedema failed to resolve. The child showed remarkable improvement with oedema subsiding over the following three days post-treatment, with weight upon discharge measured at 9 kg with no oedema. No antivirals, oxygen or steroids were used.

Case 2

A three-year-old male child, weighing 15kg, was admitted, with complaints of fever for seven days, breathlessness and mild generalised oedema. The child was admitted and tested positive for SARS COV 2 by RT-PCR test. On examination, his heart rate was

112/min, respiratory rate was 44/min (on non-invasive ventilation) and blood pressure was 92/61mm Hg. A complete blood count showed Hb: 8.0 g/dl, TLC: 13,660 mm³ and elevated CRP. The chest X-ray showed bilateral consolidation and ground glass opacity. Serum proteins, renal and liver functions were normal. The echocardiogram was normal. The presumptive diagnosis was COVID-19 pneumonia with generalised oedema. The patient was managed with methylprednisolone, antibiotics and symptomatic therapy. The child showed significant improvement in their general condition but oedema did not resolve. Nutritional therapy with F-75 milk formula was started on day three post-admission. Oedema subsided within three days post-treatment. The child's weight on discharge was 13.1 kg.

Case 3

An 11-month-old male child, weighing 7.8 kg, presented with complaints of abdominal distension, scrotal oedema and bilateral pedal oedema for six days. The child was admitted and tested negative for SARS COV 2. His COVID-19 antibody response was positive. There was no icterus but significant ascites with bilateral pedal oedema present. The liver was mildly enlarged. His blood counts were normal, CRP was elevated, serum albumin was 3g/dl and total proteins were 5g/dl, while liver enzymes were normal. An echocardiogram showed a normal heart function. The infant was breastfeeding on admission and throughout treatment. The child was managed with nutritional therapy using F-75 milk formula, after which generalised oedema subsided completely within two days.

Discussion

There have been around 38.2 million cases of COVID-19 infection in India, out of which 7.33 million cases have been reported in Maharashtra with Mumbai being the epicentre with 1,023,707 cases as of 20th January 2022. Mumbai, being a densely populated city, had great difficulty in stopping the spread of COVID-19 due to an inability to maintain social distancing and universal masking. Children in general had a low rate of infection, especially those without comorbidities (Ministry of Health and Family Welfare, 2021). Infections – such as measles, whooping cough, tuberculosis and sepsis – are

known to precipitate nutritional oedema. However, as COVID-19 is a novel infection, this is the first reported case series of such an association to the best of the author's knowledge.

Oedema formation is defined as an increase in interstitial volume and depends on the balance between intravascular and interstitial hydrostatic and oncotic pressure and the permeability of the vascular wall to macromolecules (e.g., albumin). There are two rare causes, lymphoedema and myxoedema, which are not relevant to our case series. The pathophysiology of oedema formation is conceptually categorised into three groups which relate to these three factors: an increase in capillary hydrostatic pressure, a decrease in capillary oncotic pressure and an increase in vascular permeability ('capillary leakage'). An increased capillary hydrostatic pressure is an often-hypothesised mechanism for parvovirus-induced oedema formation as most published cases have reported signs of plasma expansion. Severe sepsis in children, including from viral infection, also commonly causes oedema through high-level inflammation affecting the vascular endothelium. COVID-19 (like other severe viral infections including influenza, severe acute respiratory syndrome and Middle East respiratory syndrome) is highly proinflammatory.

Sodium retention causing oedema can be primary (due to a defect in renal sodium excretion) or secondary (due to the response of normal kidneys to an actual or sensed low effective circulating volume). Secondary causes of sodium retention, for example due to heart failure, nephrotic syndrome or liver cirrhosis, were ruled out in all our patients. Increased capillary permeability could be a cause due to free radical release from oxidative stress, a hypothesis of Michael Golden for oedema related to SAM (Golden, 2002).

Infection is almost ubiquitous in kwashiorkor – which is also referred to as nutritional oedema or oedematous malnutrition and is characterised by the presence of bilateral pitting oedema and dyspigmentation of the skin and hair – and is



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frequently precipitated by an infection such as measles. The body's defence against invading organisms is to produce free radicals in sufficient quantities to kill the organisms. The body relies upon its own protective mechanisms to limit the extent of self-damage and to repair the unavoidable damage after the organism is killed. Thus, stimulated leucocytes, specifically neutrophils, produce large quantities of superoxide and hydrogen peroxide which they release into the surrounding medium. This is compounded by a deficiency of Type 2 nutrients in malnourished patients which act as scavengers of free radicals and lead to the development of oedema. Primary sodium retention is possible as in parvovirus B19 infection, and in SAM cases we see severe curtailment of the sodium-potassium pump leading to interstitial oedema (Vlaar et al, 2014). A new hypothesis has emerged which talks of Bradykinin release as a cause of interstitial oedema (Garvin et al, 2020).

Conclusion

The presence of generalised oedema is a red flag sign in a COVID-19 positive patient. Based on our experiences of case management of child COVID-19 cases with generalised oedema, nu-

trition therapy with F-75 milk formula was associated with oedema resolution in all three cases. We therefore suggest that therapeutic nutrition treatment accompany medical case management and encourage other frontline practitioners to report on their experiences.

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Postscript

Generalised oedema in COVID-19 positive children: Comment

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Although the diagnosis of kwashiorkor malnutrition requires only nutritional oedema in settings where malnutrition is common, it is a syndrome characterised by multiple signs. When it is not clear that the

oedema is indicative of kwashiorkor, medical professionals look for verification through other signs or markers.

In 1967, a colloquium of researchers and clinicians familiar with kwashiorkor came together from multiple regions. Based on their com-

bined observations, the only sign they could all agree on was that oedema resolved quickly upon improvement of the diet (McCance and Widdowson, 1968). In kwashiorkor, bilateral pitting oedema typically starts in the feet and sometimes the face, gradually increasing

through the lower legs, hands and arms (Holt et al, 1963). Often the torso remains clear of oedema. In odd circumstances such as the three case studies described above, the diagnosis is complicated, and it may be useful to look beyond the sole criteria of bilateral pitting oedema for other clues.

Other visible signs of kwashiorkor are, roughly in the order that they are often observed, irritability, lethargy, fatty enlarged liver, loss of pigment in the skin and hair, hair that is brittle and falls out, and skin lesions – typically ‘flaky paint’ dermatosis or skin darkening. A hallmark feature of kwashiorkor is also low serum albumin along with electrolyte imbalances (Di Giovanni et al, 2016). Children with kwashiorkor very often have a distended abdomen due to the fatty liver but ascites (fluid in the peritoneal cavity) is not a characteristic of kwashiorkor. Although kwashiorkor can be found in people of all ages, it is by far most common in children under six years old and rarely found in infants under six months old.

The onset of kwashiorkor can be slow, with multiple signs other than oedema appearing and resolving slowly over time then reappearing until the child descends into overt kwashiorkor. Onset can also be much more rapid, such as in conflict whereby the child’s environment and diet are suddenly deplorable and the child becomes both psychologically and physically stressed. Rapid onset can also follow illness such as measles in children who are already nutritionally compromised with signs generally appearing as the illness clears. When onset is sufficiently rapid, signs such as skin and hair changes may not have time to develop but lethargy/irritability, fatty liver and oedema are usually present. Kwashiorkor has also been anecdotally described as occurring after starting anti-retroviral therapy (ART) in human immunodeficiency virus (HIV)-infected children, possibly because ART imposes metabolic stress (Prendergast et al, 2011).

Although the biological mechanisms behind the development of kwashiorkor remain an enigma, the oedema usually clears within a few days and the child’s general nutritional status improves with the stabilisation of electrolytes and a diet providing low doses of high-quality protein, such as found in the F-

75 milk formula mentioned in the case studies. During the resolution of oedema there is little or no change in serum albumin, suggesting other causes are corrected by feeding, antibiotics and medical care during the stabilisation phase.

COVID-19 is a novel illness about which we know very little, especially in paediatric cases. Therefore, the diagnosis of kwashiorkor malnutrition in these case studies requires some consideration.

Although both children in Cases 1 and 2 presented with oedema that cleared during the administration of F-75 milk formula, the oedema was described as general, unlike the distinct bipedal pitting oedema seen in kwashiorkor. Serum proteins were described as normal, although albumin values were not given, and neither had any other signs associated with kwashiorkor. The child in Case 3 presented with bipedal pitting oedema and was underweight even while oedematous, indicating that he was probably nutritionally compromised even before the onset of generalised oedema. Serum albumin and blood proteins were borderline low and it is likely the child had recently had COVID-19. Although ascites is not generally associated with kwashiorkor, he did have a moderately enlarged liver.

From the little information available in these case studies, it does look like the child in Case 3 probably had kwashiorkor with rapid onset due to the COVID-19 infection on top of a poor initial nutritional status. But what of the other two cases? Even in rapid onset kwashiorkor, when many signs do not have time to manifest, we still see low serum albumin. In slower onset cases, low serum albumin is observed even before the development of oedema and may linger for a while after the child clears the oedema.

As the author notes, there are multiple conditions that can lead to generalised oedema which resolves with high quality nutrients and appropriate medical care. Sepsis, whether caused by viral, bacterial or fungal pathogens, can cause oedema, fluid maldistribution and fluid overload by disruption of endothelial barriers and capillary leakage (Kelm et al, 2015). A similar mechanism can occur during intense inflammation such as is experienced when endotoxin (the outer coat of Gram-negative bac-

teria comprising lipopolysaccharide) leaks across a damaged intestinal mucosal surface (translocation). Endotoxaemia is known to occur in severe COVID-19 disease, also potentially arising from capillary leakage (Khan et al. 2021). Endotoxin and increased intestinal permeability have been identified in patients with kwashiorkor (Brewster et al. 1997). It has also been argued that the intestinal microbiota may be associated with kwashiorkor secondary to translocation of bacterial products and metabolites, including endotoxin (Pham et al. 2021). However, one challenge in interpreting human studies has been that children commonly have infections or sepsis concurrently with kwashiorkor, limiting our ability to distinguish effects between the two. Although animal models of malnutrition have not generally been able to replicate the human phenomenon of pitting oedema, evidence from an animal model (pig) has suggested that a combination of nutritional restriction and endotoxin infusion results in greater oedema around the kidneys and oxidative stress compared to nutritional restriction alone (Baek et al. 2020).

Overall, these cases demonstrate several interesting issues. Several types of severe acute disease or physiological insults may result in oedema, and pre-existing nutritional compromise, susceptibility to intestinal translocation of bacterial products and acute metabolic or inflammatory insults, along with their effects on oxidant status and metabolism, are likely to be common underlying mechanisms. Thus, oedema in kwashiorkor and in other conditions is not simply due to a low albumin level alone. A ‘double hit’ explanation may potentially underlie the common form of kwashiorkor that we see in impoverished low and middle-income populations. As the search for an understanding of kwashiorkor to enable preventive and therapeutic interventions goes on, it is helpful to observe that mechanisms in kwashiorkor have much in common with phenomena of oedema associated with other conditions.

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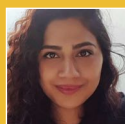
For more information on kwashiorkor, please see a recent views article co-authored by Merry Fitzpatrick in *Field Exchange* issue 65, available at: <https://www.ennonline.net/fex/65/kwashiorkorworkinggroup>

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The nutrition hotspot analysis: Prioritising intervention areas in the Sahel countries

This article outlines the reflections, technical approach and development of a tool to identify the priority areas in Sahel countries on which to focus nutrition interventions



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SAHEL REGION

Key messages:

- Since 2019, humanitarian and government partners have collaborated to develop a nutrition hotspot analysis tool.
- Despite the challenges associated with engaging with multiple partners, the development of the tool has led to the creation of knowledge that can be used to improve nutrition surveillance and inform programming in Sahelian countries.
- Moving forward, the scoring tool will enable the six Sahelian countries to regularly update this hotspot analysis by performing simple data entry tasks.

Introduction

In the Sahel countries, wasting continues to be a major public health problem. While significant efforts have been put into achieving Sustainable Development Goal #2 (Zero Hunger), progress towards ending hunger, achieving food security and improving nutrition remains slow (United Nations, 2021). This has enormous human and economic costs, especially for the poorest and most vulnerable populations. In the Sahel, an average of 4.9 million children are estimated to suffer from wasting at any given time especially during the lean season when food becomes scarce and diarrhoeal and respiratory illnesses multiply (UNICEF et al, 2020). During 2020, the Sahelian countries experienced serious food and nutrition security issues due to escalating armed conflict, recurrent climate shocks, mass population displacement and the socioeconomic impacts of the COVID-19 pandemic on both households and systems (food, health, social protection, etc.) (OCHA, 2020).

Both humanitarian and development partners have determined that addressing wasting and food insecurity requires a multi-sector approach that ensures geographical prioritisation (the identification of hotspots), convergence and high population coverage (Ma'alin et al, 2016). Such approaches must be coordinated, adapted to

needs and should prioritise the areas and populations with the highest underlying risks and aggravating factors associated with wasting.

To prioritise their humanitarian efforts, countries in the West Africa region mainly rely on the 'Cadre Harmonisé' exercise, an early warning tool employed to conduct an integrated analysis of acute food and nutrition insecurity (CILSS, 2019). This exercise aims to identify the severity of food and nutrition insecurity, estimate and prioritise the population in need of immediate assistance based on the severity of food insecurity, classify geographical areas based on phases of severity for the current or projected situation and identify the most affected areas, key drivers and appropriate actions. The method utilised to conduct the nutrition insecurity analysis is based on the prevalence of wasting (either derived from weight-for-height or mid-upper arm circumference measurements or the presence of oedema in children 6-59 months) and the prevalence of malnutrition in women aged 15-49 years (estimated from body mass index).

The method used did not directly account for the link between malnutrition – both acute and chronic – and aggravating factors, co-morbidities or risk factors within the region. The regional Food Security and Nutrition (FSN) working

group therefore requested the World Food Programme (WFP) and UNICEF to reflect on ways to develop a comprehensive analytical method that would account for associated aggravating factors to improve the identification, targeting and prioritisation of those intervention areas in need of nutrition assistance (nutrition hotspots). This article describes the approach undertaken to develop what became known as the 'nutrition hotspot analysis' in the six countries that are referred to as the 'G5+1 Sahel countries' – Burkina Faso, Mali, Mauritania, Niger, Chad and Senegal.

Consultative and technical approach

A first version of the tool based on region-specific evidence

In 2018, the G5+1 Sahel countries experienced an acute food crisis which resulted in an estimated 3.6 million wasted children under five years of age with 1.3 million children severely wasted (UNICEF, 2018). This led the regional FSN working group to undertake a consultative and technical approach to identify nutrition hotspots and develop a method for the early warning of acute nutrition insecurity, the prioritisation of geographical intervention areas and the estimation of the expected caseload of wasted children during a given time period. As a result, WFP and UNICEF regional offices started to develop this approach in 2019, in close collaboration with the national nutrition working groups or clusters in the six Sahelian countries.

The first version of the method was developed using nutrition indicators such as the prevalence of global acute malnutrition (GAM), severe

acute malnutrition (SAM) and stunting, the most recent data on internally displaced populations and the regional indicators for hazard and exposure, vulnerability and lack of coping capacity (INFORM Risk Index for Sahel¹). Region-specific evidence was used to estimate incidence correction factors per quarter which accounted for the impact of food insecurity, seasonality and COVID-19 on the nutritional status of children under five years of age and adjusted the expected caseload of wasting in the G5+1 Sahel countries accordingly (WFP, 2020). The methodology and results of the first version were published in Field Exchange issue 65 (Magagi et al, 2021).

A second version of the tool based on stronger evidence

Although the use of the first version proved helpful for programmatic purposes, the FSN working group requested that the tool be revised so that it would be grounded in stronger evidence and a data-based methodology. The same data from country-level SMART surveys and INFORM Sahel was used for the second version. However, the key difference was the extensive literature review of 120 articles that helped to identify, classify and create scores for regional-level contributing or aggravating factors, especially related to food insecurity, seasonality and COVID-19. The literature review focused mainly on the G5+1 Sahel countries.

The Universities of Tours in France and Cheikh Anta Diop in Senegal provided support for the development of the methodology (University of Tours, 2020; UCAD, 2019). The objectives of the tool were refined to meet the following:

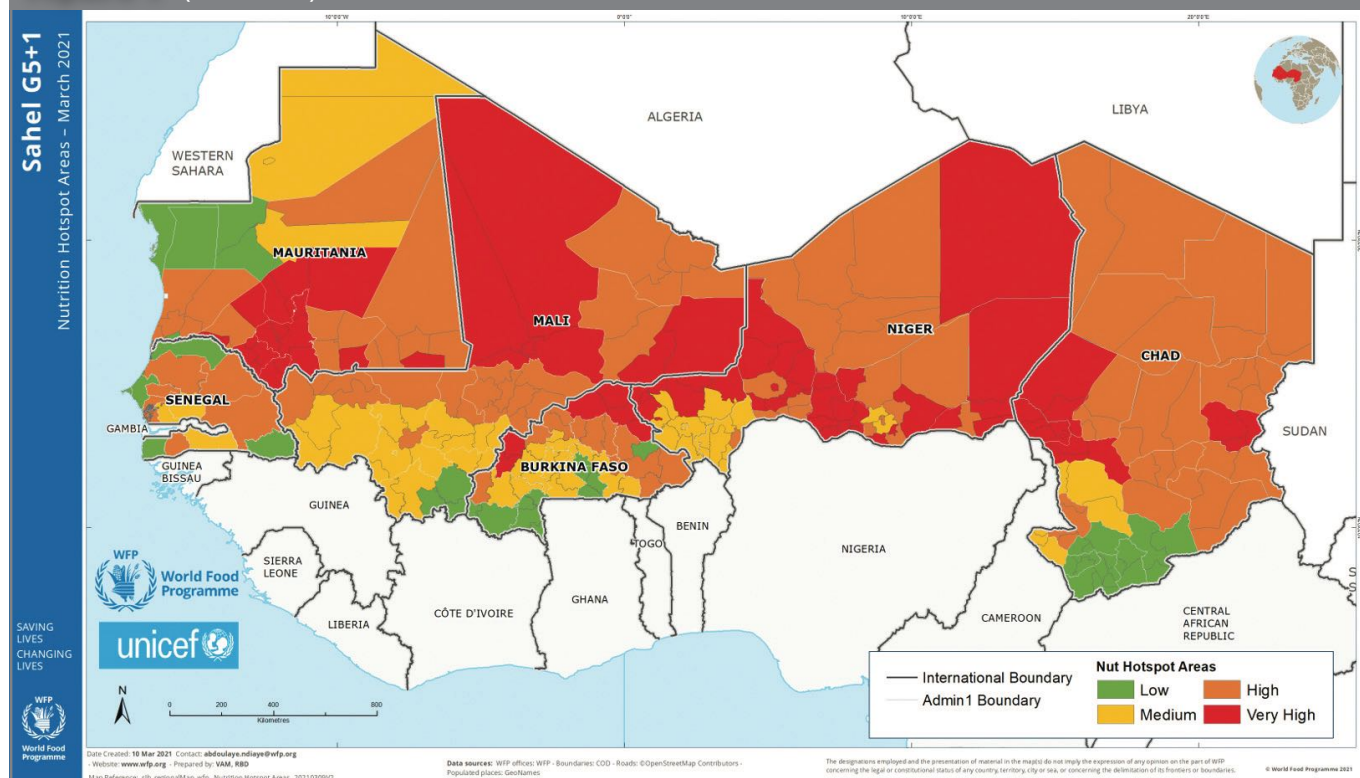
1. To identify the contributing or aggravating factors associated with malnutrition
2. To classify the identified factors according to risk level
3. To develop a scoring tool for the identified factors
4. To use the scoring tool to prioritise geographical intervention areas (hotspots)
5. To estimate the expected caseload of wasted children during 2021

After a technical review and endorsement by the regional FSN working group and national nutrition working groups or clusters involved, data from the March 2021 Cadre Harmonisé, recent SMART surveys from 2019-2020 (prevalence and risk factors of malnutrition), the October 2020 regional INFORM Sahel and the March 2020 economic and market impact analysis of COVID-19 was entered into the scoring tool to prioritise intervention areas (hotspots) and those populations in need of assistance in the G5+1 Sahel countries. When data on contributing or aggravating factors was not available or was outdated in a country, weighted averages were used from the other countries. Details on the methodology, data analysis and results are available in the FSN working group's Hotspot Analysis Technical Brief (WFP & UNICEF, 2021).

This initial round of nutrition hotspot analysis was conducted at the second-level administrative

¹ INFORM is a multi-stakeholder forum for developing shared, quantitative analysis relevant to humanitarian crises and disasters. The INFORM Risk Index is a global, open-source risk assessment for humanitarian crises and disasters. It can support decisions about prevention, preparedness and response. More information can be found at: <https://drmkc.jrc.ec.europa.eu/inform-index>

Figure 1 Number of children aged 6-59 months expected with GAM and SAM by priority areas in the G5+1 Sahel countries (March 2021)



Moving forward, the scoring tool will enable the six Sahelian countries to regularly update this hotspot analysis by conducting simple data entry. However, it should be noted that the current tool uses context-specific causal factors of wasting which means that the tool can only be used in and by the G5+1 Sahel countries.

In an effort to institutionalise routine predictive analysis, WFP has initiated a collaboration with leading universities in the Sahel, Europe and the United States. This collaboration aims at further strengthening the tool's contribution to programmatic decision-making for improved timely nutrition emergency response in the Sahel.

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A mother breastfeeding her child at a cooking demonstration where mothers learn how to prepare enriched children's porridge with locally available ingredients in Chad

zones to align with the Cadre Harmonisé and resulted in a map of hotspots, as shown on the map in Figure 1.

What we have learnt from developing the nutrition hotspot analysis tool

The overall success of this approach was the creation of knowledge that can be used to improve the targeting of food security and nutrition as well as healthcare services for priority areas (hotspots) and populations in need of urgent assistance in G5+1 Sahel countries. Another success was the use of an additional 23 criteria in the second version of the tool which made it more robust as it is based on broader evidence whereas the first version only used nine factors to prioritise nutrition hotspots and the expected caseload.

Government ownership, input and engagement through the national nutrition working groups or clusters was essential for strengthening partnerships between governments, non-governmental organisations and the United Nations agencies. Ensuring government engagement can at times be challenging and labour-intensive but this was identified as critical to help to ensure the success of the hotspot analysis and the implementation of needs-based interventions. This was achieved through regular presentations and discussions with government partners and by involving government representatives in the validation of the tool, in data analysis and in interpreting the results (hotspots and caseloads) through the national working groups.

A key challenge was to harmonise the data that was used in the scoring tool as the indicators used and the data analysis methodology were different between studies. The value of the contributing or aggravating factors associated with the outcome of interest, namely wasting and stunting, along with their associated odds ratio and p-values, was extracted from the 120 studies reviewed from the literature and compiled in an Excel spreadsheet. The median value for each measure of association was then calculated when at least five articles from five consecutive (most recent) years were available. This was followed by a 'format standardisation of data'

which consisted of converting disparate data structures into a common format while also correcting for inconsistencies, duplications and missing values. A decision tree approach, i.e., the Classification And Regression Trees (CART) method (Breiman et al, 1984), was used to validate the factors associated with both GAM (wasting) and stunting.

It has also been challenging to ensure the timely release of the nutrition hotspot analysis. Indeed, the nutrition hotspot analysis relies on data from SMART surveys and the priority zones identified in the Cadre Harmonisé. Any delays in the availability of either of these documents can negatively affect the analysis. This was mitigated by using older data from previous SMART surveys. From 2019 to 2021, there have been no delays in the annual SMART surveys or the Cadre Harmonisé conducted in the six countries. However, to anticipate any concerns that may arise in the future, discussions are ongoing with the relevant regional working groups to ensure that both the national SMART surveys and Cadre Harmonisé analysis are conducted according to an agreed calendar.

The analysis has enabled adjusting and orienting planned preventive and curative interventions, strategies and approaches as well as resources to address wasting in the priority areas. It also allowed for a harmonised regional-level analysis that enabled a comparison of malnutrition severity between countries and performance analysis (response coverage and the number of expected wasted cases reached) at national and sub-national levels across the G5+1 Sahel countries. Finally, this created opportunities for advocacy with decision-makers and donors for funding.

Conclusion

The nutrition hotspot analysis methodology is an approach that allows for the rapid harmonisation and analysis of a wide range of data available on nutrition, food security and country-specific conditions (conflict, displacement, etc.) in order to prioritise geographic areas at the lowest administrative level as well to anticipate the number of wasted cases in need of urgent assistance by geographic area.



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Addressing child wellbeing among 'skip-generation' households in Cambodia

World Vision organised monthly meetings to promote understanding of alternative care practices. Cambodia, 2021

This article outlines an innovative approach that targets grandmothers to improve child nutrition outcomes among Cambodian skip-generation households. Skip-generation households are families where grandparents raise children while parents are absent from the household

CAMBODIA

Key messages:

- Among World Vision's targeted households in Kampong Speau and Kampong Chhnang provinces in Cambodia, around 80% of mothers with children under two years of age commute daily to work in garment factories in Phnom Penh. These prolonged work absences by mothers have led to grandmothers becoming the primary caregivers of their grandchildren (skip-generation families).
- Additional caregiver responsibilities and the associated stress placed on grandmothers can contribute towards poor childcare practices.
- The innovative Grandmother Inclusive Approach can improve childcare practices among skip-generation families but political (upstream) determinants of infant and young child feeding must be better addressed to improve exclusive breastfeeding practices among garment factory worker households.

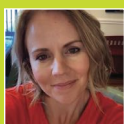
Background

Between 2010 and 2016, Cambodia experienced a substantial economic expansion largely driven by the garment industry, tourism sector and a construction boom in the capital city, Phnom Penh. The garment sector provides an important source of income and employment in Cambodia; nearly one in five women in Cambodia are employed in that sector (IOM, 2020). On average, most garment factory workers are under the age of 35 and originate from the Cambodian provinces, with Kampong Speu and Kampong Chhnang providing the third-highest number of workers behind Phnom Penh and Kandal (ILO, 2018).

Since the early 1970s, World Vision has implemented a diverse range of relief and development programmes in Cambodia including integrated nutrition, quality of education for young children and child protection programming, to improve child wellbeing outcomes especially for the most vulnerable children. One critical measure of vulnerability among children is the employment status of their caregivers. In Kampong Speu and Kampong Chhnang provinces, where World Vision works,

the majority of mothers commute daily to Phnom Penh and other provinces to work in garment factories. These mothers work an average of 60 hours per week for only 93 cents per hour – roughly USD220 per month (Bauler, 2020). Most of these mothers are between the ages of 17 and 35, the prime child-bearing and caring ages for women. Because commuting mothers are absent from the household for an average of nine to 12 hours per day, many grandmothers have been forced to assume the role of primary caregiver (Reinsma, 2020). Households where grandparents raise their grandchildren due to parental absence can be referred to as skip-generation families.

These increased childcare responsibilities for grandmothers have increased the risk of poor health outcomes and inequities among children and the grandmothers themselves. While many families depend on the income generated by garment work, this has led to poor breastfeeding and complementary feeding practices. From key informant interviews (KIIs), we learned that new mothers return to work shortly after giving birth due to poorly enforced maternity leave policies and the fear



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of having their position replaced by another woman (Bauler, 2020). Hence, children of garment factory mothers have little opportunity to be exclusively breastfed until six months of age as recommended by the World Health Organization. Of 266 garment factories in Cambodia, only 43 (19%) have functioning day-care centres at or near the factory (ILO, 2015).

Poor infant and young child feeding (IYCF) practices among children of skip-generation households can increase the risk of child malnutrition. This is already a significant issue in Cambodia where 32% of children under five years of age are stunted, 24% underweight and 10% wasted (Cambodia Demographic and Health Survey, 2014). These alarming rates of malnutrition reveal an equity gap in Cambodia as stunting is more common in rural (34%) than urban areas (24%) and is less common among children of higher educated mothers (Child Rights Now, 2018). This phenomenon is also present in Kampong Speu and Kampong Chhnang provinces as these areas are more rural and have higher illiteracy rates than World Vision-supported urban provinces.

To address these health inequities, World Vision implemented the Grandmother Inclusive Approach Project to build the knowledge, skills and behaviours of grandmothers with primary caregiving responsibility for children younger than two years old. This article shares the results that this programme had on IYCF and child wellbeing outcomes.

The Grandmother Inclusive Approach (GMIA) Project

World Vision adapted the 'Grandmother Project: Change through Culture' approach, a contextualised programme that builds upon the culturally designated role of grandmothers as the key influencers of childcare practices. This innovative approach, used previously in other World Vision contexts, was adapted to the Cambodian context as the GMIA Project to build the knowledge, skills and behaviours of grandmothers responsible for the primary care of children due to the prolonged absences of mothers for employment in garment factories. The approach also sought to alleviate grandmothers' stress by facilitating community dialogues and building social support systems to address the issues related to shifts in childcare roles within the household due to the employment of the mothers or migration of the parent/s.

World Vision Cambodia piloted the GMIA Project in Basedth (rural) in Kampong Speu Province, Samrong Tong (rural) in Kampong Chhnang province and Phnom Penh (urban) area programmes to see if the approach improved IYCF practices and child wellbeing outcomes. The project was implemented from October 2020 to October 2021 and it targeted 632 grandmothers and 52 grandmother groups were formed. In addition to the monthly grandmother health and nutrition promotion sessions, inter-generational meetings were conducted to encourage family members to share the workload placed upon grandmothers. To our knowledge,



Yun Sokhom is taking care of her grandchild at home while her daughter and son-in-law are working. Cambodia, 2021

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World Vision is the first organisation to use this approach in a context where there is significant prolonged absence by mothers due to work.

A quantitative baseline survey was conducted in July 2020 in World Vision's Basedth, Phnom Penh and Samrong Tong area programmes to determine IYCF outcome-level indicators. Selection criteria for the survey respondents included grandmothers with children under two years of age where the grandmother was the primary caregiver. A sample size of 300 grandmothers was selected to provide a 95% confidence level to detect a 10% or greater change in baseline and final indicators, assuming a 10% non-response rate. A two-stage probability sampling procedure was used to identify childcare knowledge, beliefs and practices among grandmothers and assess their self-efficacy and perceived level of stress and anxiety. Data was collected on tablets using Open Data Kit, transferred to Excel and then analysed using SPSS version 25. Chi-square statistical tests were used to analyse categorical outcome and demographic indicators and paired-sample t-tests were used to analyse continuous demographic indicators and the psychological distress score. The final evaluation (endline survey) replicated the baseline survey methodology and was conducted in October 2021.

Results Demographics

Table 1 details the demographic characteristics

of the grandmothers who participated in the GMIA Project. Of the grandmothers who were sampled at baseline, the average age was just above 55 years whereas at endline the average age was slightly older at 57 years. At endline, there were slightly fewer grandchildren living in the house (2.74 children at baseline, 2.29 children at endline) and the children were slightly older (11.70 months at baseline, 14.19 months at endline). Nearly 80% of mothers in Basedth, Phnom Penh and Samrong Tong World Vision Area programmes commuted daily to work in garment factories (79.3% at baseline, 78.1% at endline). Of those mothers who commuted daily to work in garment factories, the majority were away from the home between nine to 12 hours per day (65.1% at baseline, 75.7% at endline).

Infant and young child feeding practices

When measuring IYCF practices, only 14.5% of children aged zero to five months were exclusively breastfed for the first six months of life at baseline and 22% at endline (Table 1); there was no significant increase from baseline. The exclusive breastfeeding (EBF) rates were far lower than the country average (73%), possibly illuminating the health inequities and outcomes between skip-generation households and the broader population (Alive and Thrive, 2018).



Grandmother, Kim, a participant in the GMIA Project, feeds her grandson a nutritious meal. Cambodia, 2021

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Table 1 Comparison of findings from baseline to endline

Demographics for grandmothers with grandchildren (<24 months of age) in the GMIA baseline and endline surveys					
	Baseline (n=300) Mean ± SD		Final (n=301) Mean ± SD		
Average grandmother age in years	55.62 ± 6.6		57.04 ± 7.3		
Average number of grandchildren living in household	2.74 ± 1.70		2.29 ± 1.48		
Average age of grandchild in months	11.70 ± 6.24		14.19 ± 6.97		
Number and percentage of mothers who commute daily to work in garment factories					
Mother commutes daily to work in garment factory	238 (79.3%)		235 (78.1%)		
Number and percentage of hours a day the mother is away from home					
Less than 5 hours	1 (0.4%)		3 (1.3%)		
5–8 hours	69 (29%)		44 (18.7%)		
9–12 hours	155 (65.1%)		178 (75.7%)		
13 hours or more	13 (5.5%)		10 (4.3%)		
Exclusive breastfeeding practices in children (aged <6 months) in the GMIA baseline and endline surveys					
	Baseline (n=48)		Final (n=41)		P-value
Number of grandmothers who reported their grandchildren (<6 months) were exclusively breastfed.	7 (14.5%)		9 (22%)		0.37
Feeding practices in children (aged 6–23 months) in the GMIA baseline and endline surveys					
	Baseline (n=244)		Final (n=260)		P-value
Number of grandmothers who reported that their grandchildren received minimum dietary diversity 5 out of 8 groups	174 (71.3%)		215 (82.7%)		<0.001
Discipline and handwashing practices among grandmothers with children (aged <24 months) in the GMIA baseline and endline surveys					
	Baseline (n=300)		Final (n=301)		P-value
Number of grandmothers who did <i>not</i> use harsh physical or psychological discipline with grandchildren	101 (33.7%)		181 (60.1%)		<0.001
Number of grandmothers who used yelling or shouting as a form of psychological discipline with grandchildren	158 (52.7%) ²⁰		83 (27.6%)		<0.001
Number of grandmothers who washed their	255 (85.0%)		285 (94.7%)		<0.001
Grandmothers' wellbeing with children (aged <24 months) in the GMIA baseline and endline surveys					
	Baseline (n=300)		Final (n=299*)		P-value
Number of grandmothers who described their level of stress/exhaustion as high or very high	91 (30.3%)		54 (17.9%)		<0.001
Kessler Psychological Distress Scale in grandmothers with children (aged <24 months) in the GMIA endline survey					
	Severe	Moderate	Mild	Well	P-value
Overall (n= 299*)	18 (6%)	21 (7%)	95 (31.8%)	165 (55.2%)	0.04

* Two grandmothers opted out of this final stage of the questionnaire

Minimum dietary diversity (MDD) for children aged six to 23 months of age was based on the number of grandmothers who said their grandchild had eaten food from at least four different food groups the previous day. Food groups included dairy, grains, vitamin A-rich vegetables, other fruits/vegetables, eggs, meat/poultry/fish, legumes/nuts, oils/fats and

breastmilk (MDD, Table 1). The proportion of grandmothers who reported their grandchildren aged six to 23 months had received MDD significantly increased from 71.3% at baseline to 82.7% at endline (p<0.001).

Child care practices

There is evidence that increased levels of stress

among caregivers is associated with higher levels of child maltreatment (Rodriguez-JenKins & Marcenko, 2014). At baseline, of the grandmothers who reported any use of harsh or psychological discipline with children, shouting or yelling was the most common at baseline and endline but decreased from 52.7% to 27.6% (Table 1). At endline, significant improvements around child discipline practices were found. The proportion of grandmothers who had not used harsh physical or psychological discipline with their grandchildren in the previous two weeks increased from 33.7% at baseline to 60.1% at the end of the project (p<0.001). No significant associations were found when testing the relationship between a grandmother's stress levels and the use of harsh or psychological discipline. Harsh and psychological discipline was defined as shouting or yelling at the child, calling a child a derogatory term and shaking, spanking, slapping or hitting a child.

Handwashing with soap, especially among caregivers of small children, is a critical determinant for achieving and maintaining good child nutrition. Over 50% of cases of child undernutrition are associated with repeated diarrhoea or intestinal infections as a result of unsafe water, inadequate sanitation or insufficient hygiene (Prüss-Üstün, 2008). The proportion of grandmothers who washed their hands at appropriate times with soap significantly improved from 85.0% at baseline to 94.7% at endline (p<0.001).

Levels of stress among caregivers

Maternal garment factory work appears to place grandmothers' wellbeing under additional stress as they assume increased childcare responsibilities. The proportion of grandmothers who described their level of stress as high or very high decreased from 30.3% at baseline to 17.9% at endline (p<0.005). During KIIs, community development facilitators and community volunteers said that the parents who participated in the programme knew that grandmothers worked hard but they had no other choice but to leave their children in their care because they had to earn an income. They noted that the programme helped to improve the perception of grandmothers, recognise their work and improved relationships among family members. In some cases, mothers and fathers said they were now buying food/clothes for grandmothers and giving them time to attend GMIA meetings or do something they wanted to. One community volunteer from Samrong Tong said, "Previously only grandmothers care for children, but right now grandfathers can help and assist grandmothers in taking care of the children."

At endline, we also used Kessler's Psychological Distress Scale (KPDS) to better understand this issue and to build the practice of utilising the KPDS in Cambodia. Among the 299 grandmothers who participated in the endline survey, 6% (n=18) suffered from severe psychological distress and 7% (n=21) from moderate psychological distress and anxiety. Overall, more than half (55.2%) of grandmothers scored in the well category (Table 1).



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support grandmothers' caregiver capacity due to shifts in household responsibilities. However, EBF rates did not significantly improve showing that additional actions and investment are needed to address upstream factors of poor child wellbeing outcomes. Garment factories must enforce government-issued maternity policies and be held accountable to uphold these policies which would allow more mothers to spend at least the first few months with the child and exclusively breastfeed the child without the fear of losing their jobs. It is likely possible to improve IYCF programming by complementing behavioural (downstream) interventions with nutrition advocacy and strategies that address the political (upstream) determinants of undernutrition.

Conclusion

In summary, we recommend the following three actions when addressing poor child wellbeing in skip-generation households:

1. Utilise tailored strategies, such as the GMIA Project, to target grandmothers as primary caregivers in skip-generation families.
2. Consider including strategies to measure and address the social-psychological needs of grandmothers in skip-generation families to improve child nutrition outcomes.
3. Develop strategies to address the political (upstream) determinants of poor child nutrition – either through partnership with other organisations or through internal organisational advocacy – as factors that have led to skip-generation households are often rooted in social injustice and health inequity.

We hope this article has deepened the readers' understanding of the nutrition-related roles that grandmothers play in skip-generation households in Cambodia and provided clear recommendations for how policies and interventions can be designed to address these unique challenges.

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Discussion

Our approach was successful in improving some critical childcare practices including MDD, handwashing and the decreased use of harsh child discipline. Rates of EBF did not improve but this can be expected given that nearly 80% of grandmothers reported their daughter/daughter-in-law worked in garment factories for more than nine hours a day. When determining the barriers to EBF, upstream determinants of IYCF practices should also be taken into consideration. Global economic forces fuel the garment industry which has led to the unequal distribution of income, power and wealth among Cambodian factory workers. The Cambodian government has protection for working mothers in its 1997 Labour Law (amended in 2007), guaranteeing paid maternity leave for 90 days with 50% wage compensation as well as other conditions to support childcare and breastfeeding in the workplace. However, poor enforcement of policies, as well as cultural values and norms around gender, perpetuate gender inequities in the workplace and at home. These underlying causes of health inequalities and injustices lead to poorer wellbeing among children and caregivers living in households with garment factory workers (IOM, 2019).

A child's nutritional status is often intrinsically linked to the physical and mental wellbeing of the caregiver. A recent study evaluating grandparent caregiving in Cambodian skip-generation households found that grandparents often face difficult moral and ethical dilemmas trying to balance caregiver responsibilities and caring for their own health needs (Schneiders, 2021). Our study has shown that utilising validated tools to measure programme impact on decreasing caregiver stress and psychological wellbeing can be integrated into data collection tools. Including evidence-based tools to measure and treat caregiver depression to improve child wellbeing could be significant, as a recent systematic review and meta-analysis found that stunting could be reduced globally by about 27% by eliminating maternal depression (Slomian, 2019).

Our baseline and endline surveys, complemented by other research, reveal the challenges that skip-generation households face in providing desired childcare practices. The GMIA Project improved some critical childcare practices such as dietary diversity and caring practices related to child discipline methods and decreased levels of perceived stress among grandmothers. This demonstrates the effectiveness of the project to

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The early detection of child wasting in Indonesia amidst the COVID-19 pandemic



A child is weighed at a community health post in Indonesia

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This article outlines a family-centred screening programme for the early detection of child wasting which was piloted in March 2020 in selected districts of the East Nusa Tenggara province, Indonesia, to mitigate COVID-19 pandemic-related disruption to existing services



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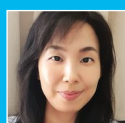
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The authors would like to thank the Kupang Municipality and Kupang District Health Office and primary health centres for modelling the family-centred mid-upper arm circumference (MUAC) programme, as well as Astryd Maranda and Ida Liem, integrated management of acute malnutrition (IMAM) Facilitators, for closely monitoring and coaching their respective districts in implementing the approach.

INDONESIA

Key messages:

- Caregiver screening correctly identified and confirmed 15 children aged 6-59 months (100% of those screened) with severe wasting and an additional 260 children (93% of those screened) with moderate wasting.
- Accuracy among caregivers was consistent across districts.
- Caregiver screening was highly accurate and not inferior to that of community health volunteers. This finding is consistent with prior evidence from sub-Saharan Africa that also finds that trained mothers and caregivers can measure mid-upper arm circumference effectively and this leads to earlier identification of wasting.

Background

An estimated 10% of Indonesian children under five years of age are wasted of which 3.5%, over two million children, are severely wasted (Ministry of Health, 2018). To address this persistent burden of child wasting, children's weight and mid-upper-arm-circumference (MUAC) are regularly screened by community health volunteers (CHV) at local integrated health posts (posyandu) before referral to primary health centres (PHC) for confirmation of diagnosis as needed. This community-based screening approach, initially piloted in 2015, has improved the coverage of both the screening and the treatment of severe wasting in the East Nusa Tenggara (NTT) province since it was scaled up in 2018 (Bait et al., 2019).

NTT is one of Indonesia's poorest provinces with limited access to healthcare facilities in isolated rural areas. The 2018 National Basic Health Survey indicated that rates of child wasting (12.8%) and severe wasting (4.6%) are higher in NTT compared to the national prevalence with even higher rates of wasting (14.8%) observed among children under two years of age. On top of wasting, NTT has been particularly affected by the COVID-19 pandemic with approximately 63,000 confirmed cases of COVID-19 in the province as of January 2022. Due

to this high case rate, strict government-implemented health protocols, such as limiting community gatherings at the health posts, were implemented which majorly disrupted posyandu activities. Accordingly, in some areas, CHVs have continued to screen children for severe wasting through home visits, rather than asking parents to gather at posyandus, but the coverage of home-based visits has been limited. Therefore, screening disruptions stand to increase the burden of child wasting in Indonesia (Akseer et al, 2020).

The family-centred screening programme was piloted to mitigate disruptions in the early detection of child wasting. Specifically, parents and caregivers were trained to identify child wasting using a colour-coded MUAC tape (family-centred MUAC). MUAC measurements are inexpensive and generally sensitive to detecting wasting among young children. Moreover, prior evidence from Niger and Chad suggests that trained mothers can measure MUAC effectively and that this leads to the earlier identification of malnutrition (Blackwell et al, 2015; Gnamien et al, 2021). Although family-centred MUAC has been piloted in several East Asian countries, including India and Bangladesh, there is limited evidence as to the extent to which this approach may be feasible in South-

East Asia, especially during the COVID-19 pandemic. The objectives of this study were to 1) describe the family-centred MUAC pilot programme, and 2) describe the accuracy of MUAC measurements by caregivers and CHVs during the ongoing COVID-19 pandemic.

Programme description

In March 2020, the NTT province health office and UNICEF introduced the family-centred MUAC pilot programme to strengthen the existing community health platform in two districts: Kupang Municipality (an urban setting) and Kupang District (a peri-urban setting). Between April and December 2020, 10 PHCs in Kupang Municipality and 11 PHCs in Kupang District implemented Family MUAC screening. A basic overview of the programme's concept was provided to the participating PHCs. Supported by UNICEF, the PHCs agreed on mechanisms to train caregivers, which included COVID-19 safe protocols, as well as the data reporting procedures.

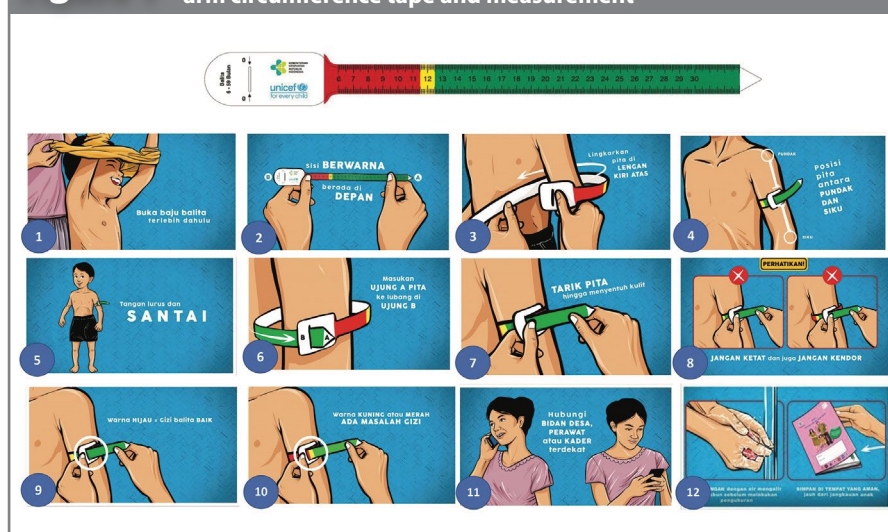
The programme employed a train-the-trainer model. First, the CHVs received orientation from the PHC health workers on how to train caregivers; CHVs were provided with MUAC tapes and information, education and communication materials for distribution to caregivers. Then, CHVs were responsible for training and mentoring five to 12 nearby caregivers either online or in-person based on an existing list of children under the age of five years who lived within their area of operation.

No caregivers declined to take part in this pilot initiative given their previously established relationship with the CHVs. Approximately 19,000 (5,700 online and 13,300 in-person in Kupang Municipality) and 14,000 (980 online and 13,020 in-person in Kupang District) caregivers received training on screening children aged 6–59 months for wasting using colour-coded MUAC tapes (Figure 1). Caregivers were further instructed to bring their children to PHCs for further examination if they had a red MUAC (<115mm), yellow MUAC (115<125mm) or were visibly thin. The training mechanism depended on the number of COVID-19 cases in a particular area and the caregivers' access to mobile technology.

Additional screening by CHVs continued through home visits. There was limited supervision of the CHV and caregivers' activities after the training due to the COVID-19 social distancing restrictions. However, health workers continued to conduct monthly visits to each village and, as appropriate, took such opportunity to strengthen the CHVs' capacity by conducting joint home visits to households with children aged 6–59 months.

CHVs collated and provided village-level data to PHCs on the total number of children screened, screening results (e.g., red and yellow MUAC), the total number of children referred

Figure 1 Training materials provided to caregivers on mid-upper arm circumference tape and measurement



to PHCs, case confirmation and the number of children treated for severe wasting. Descriptive statistics are presented as percentages overall and by district.

Programme results

Overall, approximately 30,000 children aged 6–59 months (~58% of those eligible) were screened by CHVs and caregivers in Kupang District and Kupang Municipality between April and December 2020 (Table 1). Similar proportions of children were screened by caregivers in each district.

Screening resulted in 2,249 children being referred to PHCs, including 1,684 children screened by CHVs and 565 by caregivers, for confirmation of their wasting diagnosis. Of these, less than half (42%) of children visited a PHC as instructed with a higher proportion of children screened by caregivers (86%) visiting the PHC compared to those referred by CHVs (27%). This trend was largely driven by differences in attendance among children in Kupang District; in this peri-urban setting, only 26% (N=438) of children referred by CHVs attended the health centres compared to 87% (N=379) of children referred by caregivers. Attendance was more comparable among CHVs (100%) and caregivers (86%) in Kupang Municipality.

Caregivers' MUAC measurements were highly accurate. Overall, caregiver screening correctly identified and confirmed 15 children aged 6–59 months (100% of those screened) with severe wasting and an additional 260 children (93% of those screened) with moderate wasting; accuracy among caregivers was consistent across districts. Among CHVs, the accuracy of screening measurements was somewhat lower; health workers confirmed 82% of children screened were severely wasted (red MUAC) and 49% of children screened were moderately wasted (yellow MUAC). All of the children diagnosed with severe wasting received the correct treatment.

Successes and challenges

There is growing evidence that parents and caregivers can play an important role in screening for wasting through MUAC measurement (Buttarelli, Woodhead & Rio, 2021). Importantly, caregiver screening was highly accurate and not inferior to that of the CHVs amidst the COVID-19 pandemic. This finding is consistent with the limited prior evidence, mostly from sub-Saharan Africa, that also finds that trained mothers and caregivers can measure MUAC effectively and this leads to the earlier identification of malnutrition.

Notably, highly accurate measurements among caregivers occurred despite relatively limited training and supervision. Due to COVID-19, caregivers were only trained once and they received just one page of instructions and/or information to access online videos. Given the limited training, it will be important to consider incorporating refresher training courses to ensure the continued uptake and regular practice of MUAC measurements. Although capacity building to train caregivers on MUAC measurements was limited, this data suggests that family-centred screening may be a promising approach to the early detection of child wasting in Indonesia. More regular and earlier detection of wasting could reduce the risk of mortality and morbidity among children aged 6–59 months.

In this programme, we found that a larger proportion of children screened by caregivers attended the PHCs as recommended. The differences in attendance suggest that the trained caregivers may have had better knowledge and awareness of wasting, and the risks of wasting, as a result of the training provided and in turn a greater urgency related to taking their children to PHCs when needed compared to caregivers of children referred by CHVs. Challenges to accessing PHCs in the Kupang District, a peri-urban setting, such as travelling



Caregiver receiving in-person training from CHW on MUAC measurement. Indonesia, 2020

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longer distances and the high cost of transportation, may have also played a role, as has been reported in one prior review (Buttarelli et al., 2021). It is also plausible that caregivers who opted to participate in the training were more generally motivated regarding care-seeking behaviours.

There are several limitations of this pilot study. Firstly, the cross-sectional design and ecological (i.e., village-level) data limits study conclusions so any inferences must therefore be made with caution. Secondly, the programme was only implemented in selected districts in Indonesia and thus may not be generalisable to other settings.

Conclusion

Despite limitations, the data suggests that the programme increased capacity for the screening and treatment of child wasting during the pandemic. Given the accuracy of caregiver screening, continuing the family-centred MUAC screening programme beyond the COVID-19 pandemic warrants consideration. Future work should aim to better understand the differences in attendance between caregivers and CHV referrals in order to address any barriers to case confirmation.

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Table 1 Screening of child wasting by trained community health volunteers and caregivers

	Overall (N=50,382 eligible) ¹			Kupang District (N=29,561 eligible) ¹		Kupang Municipality (N=20,821 eligible) ¹	
	Total	CHVs	Caregivers	CHVs	Caregivers	CHVs	Caregivers
Number of children screened ²	29,163 (58%)	17,125 (34%)	12,038 (24%)	15,059 (51%)	7,664 (26%)	2,066 (10%)	4,374 (21%)
Screening Results:³							
Red MUAC	37 (0.1%)	22 (0.1%)	15 (0.1%)	21 (0.1%)	9 (0.1%)	1 (<0.1%)	6 (0.1%)
Yellow MUAC	544 (2%)	265 (2%)	279 (2%)	248 (2%)	192 (3%)	17 (1%)	87 (2%)
Green MUAC and not visibly thin	26,914 (92%)	15,441 (90%)	11,473 (95%)	13,396 (89%)	7,226 (94%)	2,045 (99%)	4,247 (97%)
Green MUAC but visibly thin	1,668 (6%)	1,397 (8%)	271 (2%)	1394 (9%)	237 (3%)	3 (0.1%)	34 (1%)
Health Worker Confirmation:							
Referred for confirmation ⁴	2,249 (8%)	1,684 (10%)	565 (5%)	1,663 (11%)	438 (6%)	21 (1%)	127 (3%)
Attended confirmation ⁵	947 (42%)	459 (27%)	488 (86%)	438 (26%)	379 (87%)	21 (100%)	109 (86%)
Confirmed severe wasting cases by MUAC ⁶	33 (89%)	18 (82%)	15 (100%)	18 (86%)	9 (100%)	0 (0%)	6 (100%)
Confirmed moderate wasting cases by MUAC ⁷	389 (72%)	129 (49%)	260 (93%)	119 (48%)	183 (95%)	10 (59%)	77 (89%)
Received treatment for severe wasting ⁸	206 (100%)	97 (100%)	109 (100%)	97 (100%)	74 (100%)	0 (NA)	35 (100%)

MUAC = mid-upper-arm-circumference; NA = not applicable

¹ Number of children aged 6-59 months targeted for screening

² Number (%) who were screened among those eligible

³ Number (%) among those screened

⁴ Number (%) with red or yellow MUAC or green MUAC but visibly thin

⁵ Number (%) who attended health clinics out of the total number referred for screening

⁶ Number (%) out of the total number of children screened red

⁷ Number (%) out of the total number of children screened yellow

⁸ Number (%) of severely wasted children treated based on MUAC and weight-for-height z-score

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GNC Technical Alliance experience of providing technical support to ARDI, a national NGO in Somalia

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SOMALIA

Key messages:

- The GNC Technical Alliance has developed technical support packages to best meet the technical needs of local NGOs. One of the first of such support packages was provided to The African Relief Development Initiative in Somalia in relation to integrated management of acute malnutrition (IMAM) capacity strengthening.
- Key learnings from this experience include the importance of using technical experts based as locally as possible, the need to provide or link with organisational capacity strengthening, supporting the prioritisation of technical needs, and consider financial barriers.



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*This article has been developed from a **GNC Technical Alliance brief**¹ which explores how local non-governmental organisations (NGOs) can receive technical support from the Technical Alliance and a **related podcast**². The brief was prepared for the Alliance by ENN together with members of the Alliance's Technical Support Team. We would like to extend special thanks to Abdi Moge Mohamed from ARDI for providing content based on his experience of receiving support from the Alliance.*

Background

The African Relief Development Initiative (ARDI) is a non-governmental, non-profit, voluntary local organisation operating in Southern Somalia. Since 2018, with support from UNICEF, ARDI has implemented a range of ad hoc small-scale nutrition interventions including malnutrition screening, counselling on infant and young child feeding (IYCF), the promotion of safe water, hygiene and sanitation activities, health promotion, and the creation of mother-to-mother and father-to-father support groups.

In an internal report in early 2021, the ARDI team acknowledged the need to address the technical gaps in their nutrition team and conducted a capacity assessment. This assessment indicated needs across the nutrition in emergencies thematic areas (infant and young children feeding in emergencies (IYCF-E), nutrition assessment and surveillance, management of acute malnutrition, and social behaviour change (SBC)), as well as other operational areas (e.g., programme management, finance and monitoring). The assessment showed that only three out of the 29 staff had ever received integrated management of acute malnutrition (IMAM) training.

Given this, ARDI requested support from the Global Nutrition Cluster Technical Alliance (GNC Technical Alliance/the Alliance) to

strengthen the technical capacity of its team, initially focusing on IMAM training. ARDI hoped that such training would not only enhance its ability to carry out nutrition interventions to a high standard of quality but also put the organisation in a better position to secure future funding and partnerships having received support from the Alliance.

Technical support provision to ARDI

To meet this request for support, the Alliance's CMAM Advisor developed a tailored remote training package in order to meet ARDI's IMAM training needs and fill gaps in technical knowledge as identified through the IMAM capacity assessment and through a series of conversations with the ARDI Chief Executive Officer (CEO). From March to April 2021, the advisor offered online webinars and remote technical support, building on staff and volunteer's previous technical knowledge and training. Several pre-existing trainings were identified (such as Agora's Acute Malnutrition in Emergencies Preparedness and Response³ and Basic training on Nutrition in Emergencies⁴ and MSF's online course on Basics of a Nutrition Programme⁵) and participants had to complete them as part of the training. Prior to the training, participants were requested to complete an Online Learning Readiness Questionnaire⁶ to assess their ability and availability to conduct self-study as part of the training. A pre- and post-test was conducted. The average score prior to training was 41% and increased to 76% following the training. Unfortunately, because the trainings had to be remote (due to travel limitations due to the

¹ <https://www.enonline.net/gnctechnicalalliance/localizationlearningpackage>

² <https://www.enonline.net/gnctechnicalalliance/localizationlearningpackage>

³ <https://agora.unicef.org/course/info.php?id=28662>

⁴ <https://agora.unicef.org/course/info.php?id=22555>

⁵ <https://tembo.msf.org/course/info.php?id=506>

⁶ Online Learning Readiness Student Self-Assessment (psu.edu)

COVID-19 pandemic), there was no practical component, a typical part of IMAM trainings. The advisor had to employ creative mechanisms, such as a focus on case studies examples, the utilisation of group work, and discussions on the various challenges in implementation, to ensure that the theoretical learnings could be easily translated at a practical level.

Other challenges were also noted, particularly in terms of internet connectivity and access to computers for the ARDI team. This was mitigated through staff sharing and borrowing computers and training times shifting to when internet was more reliable. Another challenge noted was that of language barriers, with some staff members having limited understanding of English. This affected their ability to actively participate during webinars and share information when written materials were required. Fortunately, the advisor spoke Swahili, as did some members of the ARDI team and those within the team who had better English and Swahili skills were selected to support other members of the team with translation.

Despite these challenges, the training was deemed a success with ARDI's CEO, Abdi Moge Mohamed, noting in a recent interview: 'The support provided by the Alliance was beyond our expectations. The staff improved their skills and are now using the skills in the community. We've never had such support before.' Following training, staff were able to train caregivers and other community members to screen and refer children for wasting treatment. As a result, the coverage of treatment increased in the areas that ARDI serves despite the impacts of COVID-19, which in other areas were leading to reported reductions in the numbers accessing treatment. It was reported that the Ministry of Health was appreciative of how the training had helped to increase coverage and that it had led to greater admissions of wasted children to health facilities and contributed to children being presented earlier, which positively impacted treatment outcomes. Through the support, Abdi Moge Mohamed was also able to establish broader links with

the Global Nutrition Cluster (GNC) and participated in the GNC Annual Meeting 2021. This engagement facilitated networking opportunities for ARDI with numerous international NGOs and provided a platform to share ARDI's experiences for others to learn from.

The Alliance's support to local NGOs

This was one of the first support packages offered by the Alliance to a local NGO and the need came at a timely moment when the Alliance was considering how it could better serve the localisation agenda⁷ and support NGOs working at national and subnational level. Some of the key principles the Alliance is now working towards in this regard include:

- **Using technical experts that are as local as possible:** To enable a rich understanding of the challenges and context, the Alliance aims to use technical experts from the local, national, or regional context if possible. This helps to bridge linguistic and cultural divides and offers opportunities for capacity-strengthening in ways not always possible with international experts who spend only a short amount of time in-country. For the support provided to ARDI, it was not possible to identify a Somali expert despite attempts to do so, however the CMAM expert, based in Uganda and fluent in Swahili, was available.
- **Support to prioritise needs:** Local NGOs tend to have numerous technical and non-technical needs and there is a need to prioritise and determine how the Alliance is best placed to support. Like many local NGOs, ARDI had many requirements so the Alliance worked closely with ARDI to identify the priorities the Alliance could support. ARDI also had several non-technical needs, including support with programme management, financial management, and resource mobilisation. As the Alliance focuses on technical needs, it was neither in its scope or mandate to accommodate these requests. However, the Alliance does aim to connect local NGOs with

other entities that might be able to find support, such as the Scaling Up Nutrition (SUN) Civil Society Alliance and the in-country Nutrition Cluster. While the Alliance cannot always support with all requests, a key aspect of the localisation agenda is to build partnerships with organisations that provide such non-technical training and capacity-strengthening and who may be able to offer that support.

- **Consider funding barriers:** Local NGOs often struggle to access funding to implement nutrition programmes and the impact of the technical support given is less likely to be realised without local NGOs being able to 'put into practice' what they have learned. On the other hand, there is a potential that increased technical skills and capacity can make local organisations more attractive for future funding opportunities. Such aspects are considered when developing a support package for local organisations and decisions are made on a case-by-case basis. As the Alliance is not able to fund technical support to all local organisations, it needs to ensure resources are being used efficiently. One way of doing this is by working with consortiums of local NGOs and through in-country Nutrition Clusters to provide broader support to more than one organisation at a time.

What is next for the Alliance in supporting local NGOs?

The Alliance is committed to working with local NGOs to meet their technical needs through a variety of approaches. The Alliance is constantly looking to improve this support. From the experience of working with ARDI, the Alliance has been reflecting on the importance of finding experts with the appropriate language skills and working closely with in-country experts. The Alliance is currently working on developing systems to allow it to tap into local resources (including consultants and the local offices of Technical Support Team partners) in an efficient manner. This is already happening in practice, for example Action Against Hunger Somalia is currently delivering support to another local NGO (Juba Valley Development Centre) on behalf of the Alliance on IMAM training. The Alliance is also looking to partner with other entities that focus on organisational capacity strengthening to complement the work that it does.

To find out more about the Alliance or to ask a question or request support directly, please click here:

<https://ta.nutritioncluster.net/request-support> or email a member of the Alliance team at technicalalliance@nutritioncluster.net



A mother and her child receiving a counseling session in Dolow, Somalia

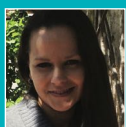
⁷ The localisation agenda is part of the Grand Bargain, a set of 51 commitments made by governments and humanitarian aid agencies at the World Humanitarian Summit in May 2016, which commits to "making principled humanitarian action as local as possible and as international as necessary.



Mother of admitted patient is screened for undernutrition, Zimbabwe

Sally Mugabe Children's Hospital: A snapshot

This article offers insight into the provision of inpatient treatment of complicated wasting at the Sally Mugabe Children's Hospital, Zimbabwe



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ZIMBABWE

Key messages:

- Wasting carries a significant health burden in Zimbabwe.
- Wasting is a complex illness caused by multiple factors, including both medical and socio-economic drivers. Therefore, it must be addressed in a holistic manner above and beyond mere nutritional rehabilitation and the treatment of medical complications.
- Creating a specialist multidisciplinary inpatient service for these vulnerable patients can improve their in-hospital outcomes and reduce mortality.

Background

Zimbabwe is currently facing multiple socio-economic challenges, healthcare sector incapacitation and the recent COVID-19 pandemic, all of which are exacerbating a precarious nutrition situation. The prevalence of wasting in Zimbabwean children (6- 59 months) increased from 3.6% in 2019 to 4.5% in 2020 (Zimbabwe Vulnerability Assessment Committee (ZimVAC), 2019; ZimVAC, 2020). Referral hospitals have experienced increased cases of complicated severe wasting, particularly in the Sally Mugabe Children's Hospital (SMCH) which saw a rapid increase from an average of 34 to 86 cases per month in 2019 and 2020 respectively.¹

The SMCH, which is part of the Sally Mugabe Central Hospital, is the largest referral hospital in Zimbabwe, boasting a 350-bed capacity. It caters for patients from the poorest areas of Harare as well as accepting referrals from most other parts of the country. The SMCH is the largest stabilisation centre (SC) for complicated wasting in the country, admitting close to 500 cases per year. Unfortunately, inpatient mortality at the SMCH has been unacceptably high and in the period of 2019-2020 was reported at 45.7%. This is an alarming number of lives lost from wasting – a largely preventable condition. Even considering that as a tertiary referral institution the SMCH received referrals for the most complicated cases of wasting, this figure cannot be justified. A secondary analysis of combined data from two hospitals in Kenya and one in Malawi showed overall inpatient mortality in severely wasted children to be 16.3% (Wen et al, 2021), demonstrating a vast gap in the quality of care for these patients in the SMCH. Wasted children represent the most vulnerable group of patients with many not accessing formal healthcare. There were 52,659 children under five years of age estimated by the Ministry of Health and Child Care (MoHCC) to be in need of nutritional rehabilitation in Zimbabwe in 2021. Unfortunately, only 26.4% of these children were reached by the formal healthcare system, falling short of the 50% target set by the government (ZimVAC, 2020).

In 2020, as a part of an effort to improve care for children with wasting in Zimbabwe, the MoHCC updated its guidelines on the integrated management of acute malnutrition (IMAM) (MoHCC, 2020) covering both inpatient and outpatient management of wasting as well as the integration of nutrition into other national healthcare programmes. However, despite the existence of

these new guidelines, the performance of the outpatient part of the IMAM programme in the country is 70.6%² which falls short of the targeted cure rate of 75%.

This article describes the journey of the SMCH in its quest to improve the quality of care for wasted children by becoming a National Centre of Excellence for wasting management.

Structure of wasting services at the hospital

Paediatric Association of Zimbabwe: Role in the project

The Paediatric Association of Zimbabwe (PAZ) is a group of paediatricians and other health professionals who aim to advance the welfare of children in Zimbabwe. Since 2019, PAZ has been working collaboratively with UNICEF and the MoHCC to build capacity and to provide mentorship in wasting management for clinicians in health facilities of various levels across the country. The previous key achievements through this partnership include:

- A capacity audit of five major hospitals managing severe wasting cases. This highlighted the major gaps in service provision for children with wasting and helped to formulate the necessary interventions to address these.
- The training of 136 doctors, 57 nurses and nutritionists across four provinces (Midlands, Matabeleland South, Manicaland and Mashonaland West) on IMAM as per national guidelines.
- Two rounds of clinical mentorship in four provinces covering 12 districts in total. This also included the support of clinical audits in each province.
- The development of online IMAM training videos for health worker capacity building.

Following the successful start of the project, the second phase of the collaboration was initiated in February 2021. The goal of this phase was to scale up and implement a sustainable, quality of care improvement intervention for children presenting to inpatient care with complicated severe wasting with the aim of reducing mortality and improving treatment outcomes. The project ac-

¹ According to unpublished District Health Information System 2 data provided by the Ministry of Health and Child Care.

² According to unpublished District Health Information System 2 data provided by the Ministry of Health and Child Care.

tivities were planned to take place over a nine-month period from February to November 2021 and included the following objectives:

Quarter 1 (22 February – 22 May 2021): The main objective of the first quarter was to establish a specialised national unit for the management of wasting. The SMCH was selected for the establishment of a Centre of Excellence for wasting management and to become the core site for training, protocol development and research. This included IMAM training of 80 clinicians working at the SMCH and the further dissemination of the acquired knowledge to their respective clinical areas. Another important aspect of the activities planned for the first quarter of the project was to establish a comprehensive data collection system for the patients admitted with wasting. Plans were put in place for the creation of a new High Dependency Unit (HDU) within the Malnutrition Unit for acutely ill children with wasting. This involved the placement of specialised equipment such as vital signs monitors, infusion pumps and syringe drivers as well as the continuous training of medical staff in the management of critically ill patients with wasting.

Quarter 2 (23 May – 23 August 2021): The main activities of the second quarter aimed to complete the training in the remaining eight provinces as well as to conduct IMAM training in four central hospitals of the country and further establish a sustainable capacity-building system. This, together with the activities carried out in the previous phase of the partnership, would ensure that all SCs in the country received training on updated IMAM guidelines. Two rounds of mentorship visits were carried out in four provinces that were not covered during the previous project: Mashonaland Central, Masvingo, Mashonaland East and Matabeleland North. One of the other core activities of the second quarter of the project was the development of a comprehensive e-learning package for IMAM for training health professionals nationwide.

Quarter 3 (23 August – 23 November 2021): During the third quarter, the project focused on the training and dissemination of the Continuous Quality Improvement (CQI) approach as guided by the MoHCC's Quality Improvement Strategy. This objective included the generic training of 100 healthcare workers across institutions of different levels with further training on the specific and practical application of CQI to the IMAM programme and its indicators. This training capacitated staff at health facilities to identify priority quality improvement needs and design strategies to track, monitor and achieve the prioritised quality improvement indicators.

Patient flow and staffing

Prior to the Malnutrition Unit inception, care for patients with severe wasting at the SMCH was provided as a part of general paediatric services. There was no prioritisation of children presenting with complicated severe wasting at the paediatric casualty centre or in the wards. In addition, such patients were usually refused admission to the intensive care unit due to presumed poor outcomes with preference instead given to children with other conditions who offered a 'better chance of survival'. There was also

no separation between wasted patients in different stages of their treatment, with newly admitted critically ill patients placed next to children who were recovering and gaining weight.

Under the new set-up, all children presenting to the SMCH casualty department are screened for wasting irrespective of the presenting illness. Patients who are identified as wasted are prioritised and managed according to the newly introduced standard operating procedures (SOPs). Patients who meet the admission criteria for the Malnutrition Unit are then admitted as priority cases and managed by a designated multidisciplinary team of doctors, nurses and a nutritionist with hospital food services supervisors (HFSS). The doctors working in the unit include a consultant paediatrician, a middle-grade doctor and two junior doctors. The junior doctors rotate on a monthly basis while all other doctors are permanent.

“Malnutrition is both treatable and preventable. We can do more, and we can do better.”

– Sally Mugabe Children's Hospital

Nurses are now allocated to the Malnutrition Unit for two months at a time, as opposed to the old system of rotation on a daily basis. This allows for better care quality due to improved accountability, continuity of care, better handover practices, teamwork and bonding between the staff and the caregivers. Furthermore, the nutrition team has now been fully integrated with the medical team and patients greatly benefit from their continuous input. The most recent addition to the malnutrition team is a qualified counsellor who specialises in disability counselling and child protection. This counsellor provides caregivers with emotional and psychological support as well as collecting qualitative data for the Malnutrition Unit on the knowledge and attitudes of the caregivers. Visiting members of the team include social workers who join the ward rounds on a weekly basis and a family planning team that provides educational sessions for the mothers twice a week.

All new admissions are placed into one of two Stabilisation Units that function as HDU settings. Once the patients are stabilised and their acute medical problems addressed, they are moved into Transition Units. This allows for the separation of patients according to the severity of their condition and the stage of their illness. The patients who are deemed medically stable are encouraged to go to the Unit's playroom where they take part in play therapy conducted

by a qualified teacher as a part of their emotional and sensory stimulation. Sensory, emotional and physical stimulation constitute a fundamental part of the rehabilitation of patients suffering with wasting and constitutes one of the 10 steps of malnutrition management as per World Health Organization (WHO) guidelines.

Following their discharge from the Malnutrition Unit, the patients are transferred to the outpatient treatment programme (OTP) and seen on a designated day at the Outpatient Department. This clinic is run jointly by doctors and nutritionists utilising a holistic approach to patient care comprising of medical and nutritional assessment, health education, counselling and emotional support. Usually, discharged patients are followed up at the Outpatient Department of the SMCH for a month or two after which they are transferred to their local OTP centres.

Amongst other activities, the malnutrition team also conducts regular screening of all paediatric inpatients admitted under other teams as well as the screening of the mothers of wasted patients.

Data collection and audit

The paucity of data on inpatients managed for wasting was one of the major challenges when the Malnutrition Unit was established. Setting up a functional data collection system was a priority. Within the first quarter of the PAZ/UNICEF collaboration, a data collection system was set up in both electronic and paper format. The information collected for every admitted patient includes demographic data, details of the presentation to the hospital, clinical course and outcome.

Death auditing, using a standardised WHO tool (WHO, 2018), is also routinely measured at the unit. The Malnutrition Unit is the first facility in the country to conduct routine formal audits of paediatric deaths and serves as a pilot site. It is intended for this practice to be disseminated to the rest of the country soon, pending approval by the MoHCC.

Key outcomes

During the first year of operation of the Malnutrition Unit, the mortality of patients admitted with complicated wasting dropped from 45.7% to 14.2% and is now comparable to similar units in neighbouring countries (Wen et al, 2021).

The unit is also a nucleus for targeted teaching and research in childhood wasting with regular teaching for nursing and medical students now conducted at the facility. From 2022, all medical students at the College of Health Sciences of University of Zimbabwe are assessed in the diagnosis and management of wasted patients since this became a part of the core curriculum. SOPs have also been developed by the team and, once finalised and approved by the MoHCC, these will be distributed to other Stabilisation Units in the country. This will assist in streamlining the care for inpatients with wasting to improve their outcomes.

Through this collaboration, the majority of districts in all provinces of Zimbabwe have now been trained in IMAM. Ongoing mentorship

visits are planned to ensure the continuity of support of the clinical staff and further capacity-building in SCs across the country. An e-learning package for IMAM training is now being finalised and will allow free nationwide access to the training resources that cover all aspects of IMAM from the background and country statistics all the way to the management and follow-up of patients with wasting. E-learning materials will be available via the MoHCC platform to make it sustainable and to allow access for health facilities at all levels.

Improvements in patient data collection allow for the identification of areas for future research with several topics already identified such as patterns of infections and their sensitivities in the admitted patients and barriers to seeking medical help, amongst others. Data collection at the Malnutrition Unit also allowed for the identification of referral hotspots, highlighting the areas in Harare and surrounding areas with a high burden of wasting in the community such as Epworth and Hopley. This supports planning for further interventions for the improvement of wasting management in both inpatient and outpatient settings as well as strengthening the links between them.

In addition, the data demonstrated a large burden of disability in children with wasting, particularly cerebral palsy. Almost a third of all patients admitted to the Malnutrition Unit had associated neurological disability. The actual burden was even higher when expressed in bed-days, increasing to around 50%, as the children with cerebral palsy take a long time to recover compared to those without a disability. The data collection at the Malnutrition Unit showed the average length of stay for children with associated neurological disability to be 3.5 weeks compared to just over two weeks for the patients with wasting alone. There is therefore a clear need to scale up the screening and active prevention of wasting in this vulnerable group of patients. According to the Malnutrition Unit data, human immunodeficiency virus infection also represents a significant burden in admitted patients and currently stands at just over 10%. This figure is likely to rise as we see the long-term effects of the COVID-19 pandemic on the routine health care programmes in the country.

What we learned from the process Successes

The project to create the Centre of Excellence for the management of malnutrition was possible due to the joint efforts of paediatricians, UNICEF and the MoHCC. It was substantiated by the clear and undoubted need for improving the quality of care for children with wasting in Zimbabwe. It now represents a hub for training and research in this area as well as being the centre for the development and implementation of the standards of care.

This project allowed the establishment of a specialised Malnutrition Unit for the management of complicated wasting in children – the first one of its kind in Zimbabwe. The patients are now managed by a specialised multidisciplinary team that draws on different areas of expertise

from all members of the team thus improving patients' outcomes. It also created a positive team spirit where all members of the team are invested in improving outcomes for each individual patient. Regular team meetings further reinforce this trend. Each mortality that occurs in the unit is discussed and audited to identify possible gaps and to improve practice for future patients. This provides an incentive for the team to commit to good care practices without seeking financial rewards.

Having a dedicated Malnutrition Unit with a specialised team gave an opportunity for targeted fundraising. Significant renovations of the Malnutrition Unit were carried out through crowd-funding which included painting, tiling, the purchase of new hospital curtains and chair-to-beds for the caregivers. The funding was provided by individuals as well as several companies, particularly those in close proximity to the SMCH as they felt that the hospital was caring for their community. The funding efforts are ongoing with the hope of being able to provide particularly vulnerable families with some basic food supplies upon their discharge from the Malnutrition Unit.

Challenges

A number of challenges were faced during the inception of the Malnutrition Unit. One of the most challenging was the nursing staff allocation restructuring. It was important for the Malnutrition Unit to have a team of dedicated nurses to allow for continuity of care as well as continuity of training. Under the new system, the nurses are attached to the Malnutrition Unit for two months at a time. In a year of the existence of the Malnutrition Unit, the majority of SMCH nurses have been a part of the malnutrition team and trained in IMAM. This was possible due to the efforts of the paediatric matrons and sisters-in-charge of the wards who were supporting the project.

Another challenge was to develop a close relationship between clinicians and nutritionists. Before the beginning of the project, a nutrition team comprised of a dietician and HFSS worked independently from the medical team, doing their own ward rounds, supplying therapeutic feeds and providing dietary counselling. Doctors consulted the dietician and her team when they felt the need. This was often not conducive for holistic patient care and created an opportunity for conflict between the teams. HFSS mostly spent their working hours in the hospital kitchens supervising the preparation of the feeds which did not capitalise on their expertise and training. Now the dietician and HFSS are an integral part of the malnutrition team with HFSS being actively involved in clinical work including ward rounds, patient counselling and screening activities.

Lessons learned

Despite the demonstrated reduction in mortality for the Malnutrition Unit, the number of deaths remains high and further efforts will be made to improve the quality of care for wasted patients. These include:

1. Accelerating the development of SOPs to further standardise the care provided in the Malnutrition Unit.
2. Completing the establishment of HDU

facilities for critically ill malnourished patients.

3. Strengthening the links between SCs and OTPs to improve follow-up and strengthen the referral system.
4. Completing the development of IMAM e-learning package for national dissemination and use.
5. Conducting research into two identified priority areas:
 - a. Patterns of infection and antibiotic sensitivity in patients presenting to the SMCH with complicated severe wasting
 - b. Actual and perceived barriers in seeking medical assistance for children with wasting
6. Lobbying for the provision of nutritional support and a social package for the families of patients with poor socioeconomic circumstances or disabilities to reduce readmission rates.
7. Engaging in screening activities and the active prevention of wasting in high-risk patients, particularly those with cerebral palsy.

Conclusion

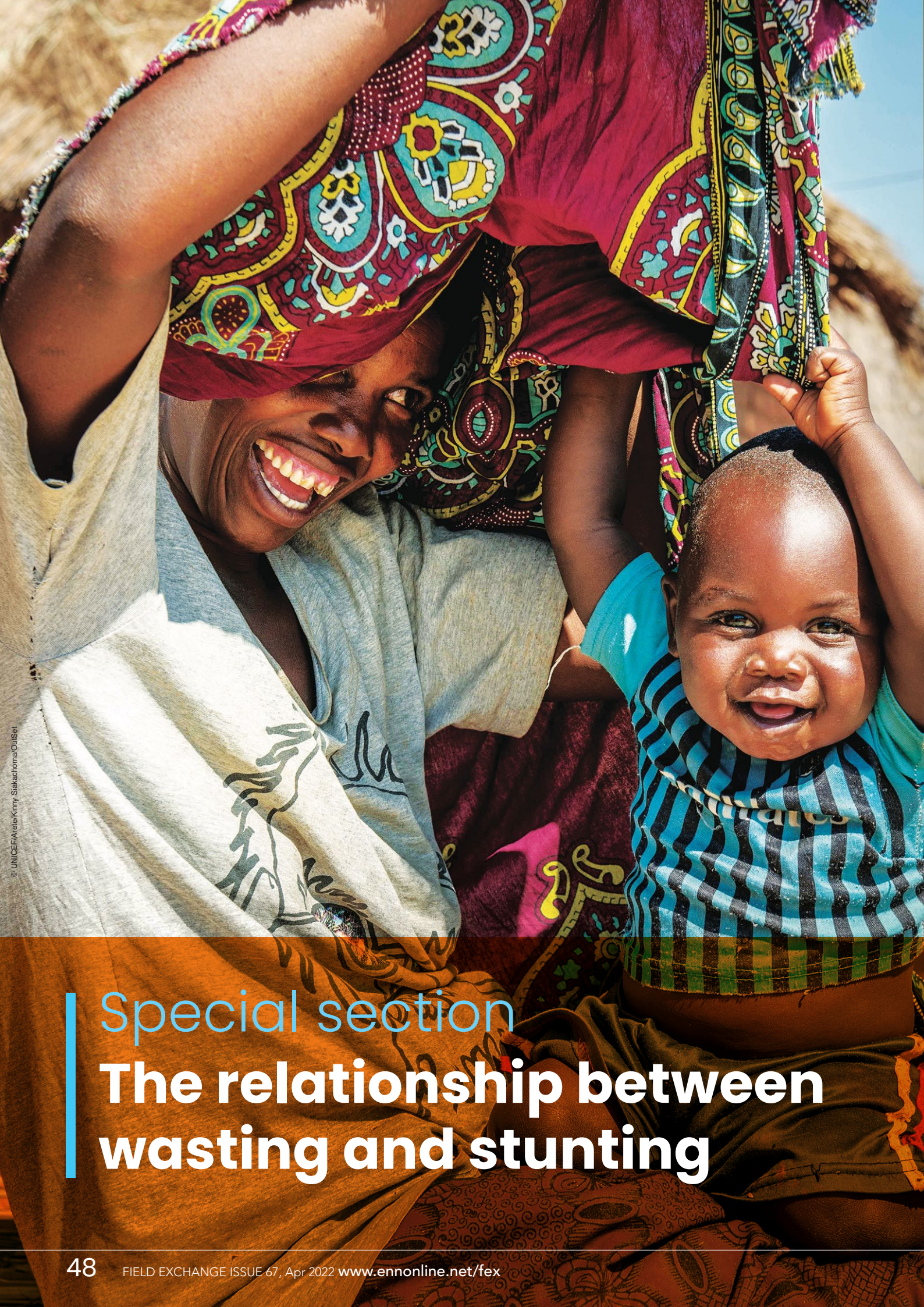
Our experience has demonstrated that the model of the Malnutrition Unit can and should be replicated in other SCs across Zimbabwe. A key starting point would be to identify malnutrition champions such as doctors, nurses and nutritionists who are passionate about improving outcomes for the wasted children admitted to their facilities. In addition, SOPs developed at the SMCH Malnutrition Unit should be rolled out in other centres in the country to standardise care for this vulnerable group of patients.

As a Malnutrition Unit we are at the beginning of our journey but, in a short period of existence, a significant reduction in mortality has been achieved. We will continue working closely with our partners to improve the quality of care for children with wasting and ensure the sustainability of the project.

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Special section

The relationship between wasting and stunting



Special section: The relationship between wasting and stunting Editorial

Dear readers,

Our aim with this special section of Field Exchange (FEX) is to convey to you the scope of work that the Wasting and Stunting Technical Interest Group (WaSt TIG), and individuals and agencies in the wider nutrition sector, have been doing to explore the relationship between child wasting and stunting and what that means for how research is conducted, programmes are designed and policies are framed.

The WaSt TIG sprang into life in 2014, stimulated by an ENN paper that explored global and country level financing for community-based management of acute malnutrition. The paper highlighted the siloing of wasting as a humanitarian issue and stunting as a development one and questioned the gap this created between programming, financing and policies to deal with these two forms of malnutrition (Shoham, Dolan & Gostelow, 2013). The initiative began with a small group of people (including the three of us) who wanted to better understand the connections between these two widespread forms of undernutrition with a view to identifying ways to break down the siloes and, in so doing, make better progress to tackle wasting and stunting together. Irish Aid and USAID championed this work from the outset and continue to do so and for this we are extremely grateful, as we are to the members of the group who give of their time and expertise – often freely.

The first article in this issue of FEX, (page 51) is a summary of the last eight years of the work of the WaSt TIG taking you through the phases of this exploration. As you will see, much has been achieved in building and influencing the sector's understanding of the issues including evidence reviews, defining and filling evidence

gaps and exploring the implications of findings for further research, policy and practice.

The second article (page 57) focuses on key research findings. It summarises a recently published systematic review that updates the evidence on the relationship between wasting and stunting generated by the WaSt group and by others. The review highlights the co-existence of wasting and stunting in children, the high mortality risk associated with this, the detrimental effect of wasting on linear (height) growth and the need for further exploration of how wasting treatment might better support that growth. An accompanying views article on linear growth (page 70) goes on to explore the latter question and offers suggestions for research and practice. The findings of the systematic review are significant as they strongly indicate that approaches that focus on wasting or stunting in isolation, or on prevention or treatment in isolation, are missing opportunities for greater impact on preventing both child undernutrition and the associated mortality.

Two summaries of 'hot off the press' research complement the findings of the systematic review. The first is an analysis of 12 mortality cohorts to determine the anthropometric criteria best suited to identifying malnourished children at most risk of dying including those who are concurrently wasted and stunted (page 56). The highlight of this analysis is that weight-for-age, a measure of underweight that is used in clinic-based and community-based growth monitoring in many contexts, accompanied by existing mid-upper arm circumference criteria may best identify those children most in need of treatment. The second summary (page 58) builds on the published work of the group exploring the patterns

of sex difference in child wasting and stunting, previously summarised in FEX¹, which indicated that boys are more likely to be wasted and stunted than girls. It explores the origins, pathways and consequences of these sex differences.

This special section also includes a number of articles illustrating country experiences of trying to bring together approaches to wasting and stunting or at least to start thinking through the opportunities to do so. The Government of Indonesia highlights its programme to end stunting which includes wasting treatment through the health system as an integral component (page 63). The non-governmental organisation, GOAL, describes its Nutrition Impact and Positive Practice approach in Sudan for the prevention of moderate acute malnutrition (moderate wasting) and the opportunities its holistic approach to address the underlying behavioural drivers of malnutrition offers for a joint wasting and stunting prevention approach (page 67). Other country examples, from Angola and Somalia, focus on the collection of data on both forms of malnutrition and their overlap and highlight the question of what is required next to shape the integrated approaches that the data suggests are needed. World Vision's analysis of the prevalence of concurrent wasting and stunting in Angola poses the question of how programmes may better target this high risk group (page 72). An interesting article by ACF details the findings of a Link NCA in Somalia exploring the risk factors for wasting, stunting and underweight and highlights both the overlap of the risk factors between wasting and stunting (something that was highlighted in an early review of evidence by the WaSt TIG) and some divergence in that specific context (page 53). It speaks to the need for context specific joint approaches to mal-

¹ <https://www.enonline.net/fex/64/sexdifferencesinundernutrition>

nutrition that can capitalise on opportunities to reduce co-existing risk factors.

The influence of the work of the group on research and policy in the wider community has been a key feature over the years. This is illustrated in a number of articles including a commentary exploring the content of the 2021 *Lancet* nutrition series (page 60) and a views piece in which USAID's Erin Boyd shares the donor's experience both with supporting the work of the WaSt TIG and how the work has influenced and supported USAID's recognition of the importance of a more integrated approach to achieve impacts on both wasting and stunting across their Bureaus (page 66).

There are several important elements of the work of the WaSt TIG not represented in this special section of FEX but which we wanted to highlight for you here. A significant body of work on wasting prevention in the context of stunting prevention, highlighting the opportunities for integrating approaches, has been completed and was recently used as a basis for a multi-agency call to action at the Nutrition for Growth Summit. Several pieces of research from the group have thrown new light on the question of which undernourished children are at most risk of dying and suggest that the intensity of treatment (therapeutic/supplementary) could be gauged by that level of risk. These papers have influenced the initiation of a risk stratification exercise by the World Health Organization alongside its wasting treatment and prevention guideline process which will re-examine multiple datasets in relation to mortality risk. Finally, the group's mortality analysis finding on the utility of severely low weight-for-age for identifying at risk children has generated the development of an implementation study research protocol to test the appropriate intensity and duration of treatment for that group. A complementary analysis of existing treatment programme datasets exploring the response to treatment for this at risk group is under review for

publication. Looking ahead, there are also two new pieces (a paper and a brief) that communicate to other interested researchers the learnings of the group's work for the design and methodology of research that reflects and/or further explores the relationship between wasting and stunting. More information on these and all the work of the group can be found on our website, <https://www.ennonline.net/ourwork/reviews/wastingstunting>

By the middle of this year the WaSt TIG will be coming to the end of its current workplan. This will mean convening as a group to take stock of what has been achieved and discussing where to best focus energies in the next period. We expect there will be priority evidence gaps to fill, some by the group and others by the wider community, that are essential to underpin an even stronger case for addressing undernutrition and for maximising how investments are used. Evidence of the wider impacts that wasting has on growth and development and the longer-term implications strengthens the importance of addressing this issue not just to save lives, but also to ensure children go on to thrive and get the most out of their lives. Questions raised in the articles you will read in this special section are going to require concerted investment to answer. As highlighted in the country examples, there is also a way to go in working together with you the reader and others to translate this work into more effective policy and programming on the ground. The call for content for this sub section yielded few examples from country level which perhaps highlights the challenges of translating this work into more effective policy and programming on the ground. The country examples that are included suggest that there is a way to go in working together with you the reader and others to do exactly that.

One of the biggest and most satisfying lessons we have learned from being part of the WaSt TIG

is that we can achieve a remarkable amount with relatively few resources when we have had a committed coalition of individuals working together in an open and coordinated way. We see the next phase of the work as an opportunity to expand this out to the wider sector, building a common understanding of priority areas for research and a common vision of where we need to get to. In times when international and national resources are extremely stretched, yet the challenges to achieving the sustainable development goals and the 'leave no one behind' agenda are considerable, this next phase feels particularly important. We hope this essential work demonstrating the interrelationships between wasting and stunting can continue to shed new light on where the biggest risks to child undernutrition, mortality and longer-term development are. In turn, we trust that this will provide a stronger basis for advancing actions at greater scale and more rapidly to accelerate progress towards improving outcomes for children.

We would like to keep engaged with our FEX readers so, to get involved with the work of the group or to discuss how to bring the lens of the relationship between wasting and stunting into your own work, please get in touch with the WaSt TIG coordinators, Tanya Khara and Natalie Sessions (tanya@ennonline.net, natalie@ennonline.net).

Wishing you all a good read,

Tanya Khara (ENN), Abigail Perry (WFP & WaSt TIG member), Carmel Dolan (N4D & WaSt TIG member)

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					Zulfiqar Bhutta

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Special section:

The Wasting and Stunting Technical Interest Group

A summary of the work to date

This article outlines the work of the Wasting-Stunting Technical Interest Group since its inception in 2014, highlighting the important research that has been undertaken to learn more about the complex relationship between wasting and stunting. This article was written by **Natalie Sessions**, Senior Nutritionist at ENN, and **Tanya Khara**, Technical Director at ENN.

Background

Over recent decades, a division in the conceptualisation and practice of tackling child wasting and stunting has pervaded the nutrition sector, resulting in different policies, programmes, research and financing mechanisms to tackle these separately. During emergencies, the focus of programmes tends to be short-term, to treat wasted children and prevent deaths, while in longer-term development programmes the focus has been on preventing stunting and micronutrient deficits caused by long-term undernutrition. This is despite the long-known fact that the burden of wasting is high in many non-emergency contexts where there is a focus on long-term development and that there is a high prevalence of stunting in many humanitarian contexts. This separation also remains despite the fact that as far back as 1973, the child malnutrition expert, John Waterlow, reported on the links between the two, writing that “in practice, in a great many undernourished children, both processes will be at work” (Waterlow, 1973).

In 2014, ENN started to explore this separation, setting out to better understand the complex relationships and associations between wasting and stunting and examine whether current separations were justified or useful to achieve the goals of malnutrition prevention and treatment programmes. To reach its aims, ENN set up the Wasting-Stunting Technical Interest Group (WaSt-TIG), a group of 42 expert researchers, programmers and donors in the fields of child growth, nutrition and epidemiology. Since 2014, the work of the WaSt TIG has evolved, initially focusing on reviewing existing evidence and defining research gaps, to mining existing data, delving deeper and communicating what has been learnt thus far and exploring the implications of findings for policy and practice.

Reviewing existing evidence and defining research gaps

Initially, the WaSt TIG developed a narrative review of the available literature on the relationship between wasting and stunting.¹ This paper explored the evidence of shared causes and effects, examined the patterns of association, highlighted the physiological mechanisms that may link these two manifestations of undernutrition and reflected on the potential policy and programmatic implications of the indications arising from the evidence reviewed. Even at this early stage, it was clear to the group that wasting and stunting were more closely linked than commonly recognised. A particularly striking finding was that children who experienced both deficits had a disproportionately high level of mortality risk (McDonald et al, 2013). This narrative review also highlighted a number of research gaps and, as a natural next step, a research prioritisation exercise was carried out to guide future research investments on the relationship (Angood et al, 2016). This exercise provided the WaSt TIG with clear workplan priorities and the next steps to further understand the relationship between wasting and stunting.

It was determined that quite a number of research questions could be answered through further analysis of existing datasets. Two questions stood out in particular as being relatively straight forward to answer: 1) ‘What more can cross-sectional data tell us about the factors associated with childhood wasting and stunting and concurrence?’ and 2) ‘How does concurrent wasting and stunting develop over time?’. The group began to explore existing datasets in this regard. Based on a request by the independent expert group leading the production of the 2015 Global Nutrition Report, a short analysis of national surveys from five high-burden countries was conducted to estimate the burden of concurrent

wasting and stunting.² This analysis found that around 16 million children globally may be both wasted and stunted at the same time.

Mining existing data

To expand the analysis, the WaSt-TIG subsequently conducted a re-analysis of Demographic and Health Survey and Multiple Indicator Cluster Survey datasets from 84 countries. This study generated a pooled prevalence estimate of the burden of concurrent wasting and stunting in those countries of 3.0%, 95% CI [2.97, 3.06], with a range from 0% to 8.0%. (Khara et al, 2018). This was the first multiple country estimation of the prevalence and burden of concurrence and the findings were published in the 2016 Global Nutrition Report (Global Nutrition Report, 2016). Available Standardized Monitoring and Assessment of Relief and Transitions survey data from 51 countries was also analysed to examine concurrence in more detail (which children were being affected) and to understand whether existing measures being used within programmes might be identifying them (Myatt et al, 2018). This study found that younger children, under 36 months of age, and males were more likely to experience concurrent wasting and stunting.

As a next step, the WaSt-TIG began exploring available cohort datasets to further elaborate on these findings. To better understand the implications of concurrent wasting and stunting and to hone in on what this meant for identifying those children at highest mortality risk for priority treatment, the group were able to look at nutrition indicators and mortality risk in a cohort of children in Niakhar, Senegal (Garenne et al, 2019). This study reiterated the finding that concurrent wasting and stunting was a strong risk factor for child

¹ https://www.ennonline.net/attachments/1862/WAST_140714.pdf

² <https://globalnutritionreport.org/2015>

mortality and by looking further into the ability of different indicators to identify risk of death, it was found that a combination of severely low weight-for-age z-scores and mid-upper arm circumference worked best for identifying those children most at risk of dying, including those concurrently wasted and stunted. This analysis led to the development of a concept note for a cohort study aiming to examine the relationship between stunting and wasting and their combined effect on mortality into existing programme practices. Funding was successfully raised from the United States Agency of International Development's Bureau for Humanitarian Assistance.

A separate analysis of cohort data from the Gambia from the Medical Research Council (MRC) Gambia surveillance programme began at this time to also explore the child's experience of wasting and stunting over time to see if there were any patterns emerging.

Delving deeper and communicating what we have learned

The MRC surveillance data analysis proved complex but illuminating (Schoenbuchner et al, 2019). It replicated earlier findings by Richards et al (2012) in that being wasted was predictive of stunting three months later, irrespective of whether the subjects were already stunted. It further found that children who became stunted at two years of age had experienced more wasting during their lives compared to non-stunted children. Seasonal patterns for wasting were also noted in this analysis with infants born at the start of the annual wet season showing early growth faltering, putting them at increased risk of subsequent stunting.

Given the emerging evidence, the WaSt-TIG felt it was important to start asking 'So what?'. A policy brief entitled 'Child wasting and stunting, 'Time to overcome the separation',³ was therefore developed. This brief outlined the scientific grounds for concluding that the current separation between wasting and stunting in policy, programmes and research was not justified and may even be detrimental. It called for a radical change in how we view, finance and intervene to reduce child wasting and stunting. The call was taken further in the publication of a viewpoint article, 'Beyond Wasted and Stunted – A paradigm shift is needed to fight child undernutrition',⁴ published in *The Lancet Child and Adolescent Health*.

An evaluation of the WaSt-TIG work was also conducted using a 'Story of Change'⁵ method. This evaluation found that successes within the project had been driven by the way in which the WaSt TIG operates: it is made up of a mix of expert individual members who represent themselves rather than their institution's agenda and who function in

an engaged, iterative, exploratory and task-orientated manner. In terms of achievements, it was found that the project has contributed to a solid evidence base around the linkages between wasting and stunting, promoted discussions and a shift in the narrative around wasting and stunting and what is needed to address these at the global level among different institutions and has contributed to bridging the divide between the wasting and stunting communities.

Implications for policy and practice

In 2020, the WaSt-TIG entered its fourth phase of work, with work on key workstreams continuing. This included an expansion of the analysis of anthropometric measures and mortality risk in multiple datasets, an updated systematic review exploring the relationship between wasting and stunting, a systematic review and meta-analysis exploring sex differences in undernutrition triggered by the somewhat surprising finding in the group's multiple dataset analyses that boys are more vulnerable to undernutrition than girls, and a briefing note for policymakers and programme implementers on 'best practices in preventing child wasting within the wider context of undernutrition'. The findings of much of this work are highlighted in subsequent articles in this special section and thus will not be explored here in-depth.

Conclusion

A lot has been achieved by the WaSt-TIG in a relatively short period and with limited financial resources. Bringing together researchers with policy developers and nutrition programme staff has enabled discussions about how research can be used to improve our understanding of undernutrition, its consequences for children's growth and how to prevent it. As one respondent noted in the Story of Change evaluation, "Everything we know about (the relationship between) wasting and stunting is a product of this group".

While a great deal has been achieved, there is still much work to be done, particularly in terms of further articulating the programme and policy implications for this work. Some of the exciting next steps have been unpacked in the editorial of this special section. These include a focus on dissemination and advocacy, translating evidence into practice, expanding to other settings at both a country and regional level and further exploring the evidence.

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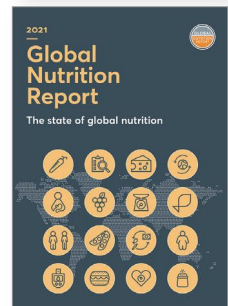
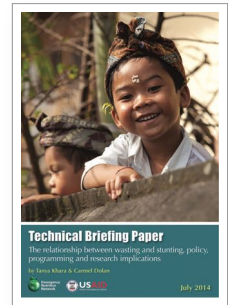
³ www.ennonline.net/fex/58/childwastseparation

⁴ www.sciencedirect.com/science/article/abs/pii/S2352464219302445

⁵ https://www.ennonline.net/attachments/3565/SOC_Wasting_Stunting_v5.pdf

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Wasting and stunting risk factors in Somali internally displaced person settlements

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Women and their children wait to receive assistance at Community Empowerment and Development Action Health Centre in Dolow, Somalia

This article summarises the key findings of a recent Link Nutrition Causal Analysis (NCA) study conducted in Settlements for the Internally Displaced Population in Dolow, Somalia. The primary quantitative data collection was substituted by secondary quantitative data analyses using datasets provided by the Food Security and Nutrition Analysis Unit (FSNAU) covering the Gu and Deyr seasons between 2014 and 2020. Therefore, this is the first Link NCA study with a longitudinal perspective



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SOMALIA

Key messages:

- While the overlap between the risk factors of wasting and stunting in Dolow was considerable, not all the studied risk factors were consistently relevant for every nutrition outcome and/or season. The observed differences, therefore, need to be studied, especially in the case of reverse or counter-intuitive associations, and properly considered in future programming.
- Common risk factors for wasting and stunting include a male child, the occurrence of morbidities, including diarrhoea and pneumonia, and the household's dependence on gifts/zakaat as their primary source of income. Children younger than 24 months also had higher odds of being wasted or stunted.
- On the other hand, children were less likely to be wasted or stunted if their household owned land or declared petty trade as their primary source of income.

Background

Dolow – also spelt Dolow or Doolow (Somali) – is a town in the Gedo region of South-Central Somalia, on the border with Ethiopia and Kenya, and around which numerous internally displaced person (IDP) settlements exist. The Gedo region has long been burdened with the cumulative effects of protracted conflict and recurrent natural disasters such as drought. These events have resulted in the disruption of livelihood systems and the displacement of the population from within and around the region. The internally displaced population has settled predominantly in two informal settlements, Kabasa and Qansahley, representing 70% of Dolow's total population. The population is food insecure and reliant on casual labour to earn money as other livelihoods options are scarce.

The level of global acute malnutrition (GAM) across the Dolow IDP settlements remains consistently high and often at the emergency threshold. The latest data shows that 14.3% of children under five years of age are wasted and 25.3% are stunted (GMR, 2021). Multiple root causes such as poverty, lack of education and cultural

practices – such as early marriage and pregnancy – contribute to the serious nutrition situation, exacerbated by environmental threats and continual conflict (GNC, 2021).

Most interventions in the Dolow IDP settlements are primarily provided by United Nations (UN) agencies either directly or via their local partners. They predominantly cover the health, nutrition and water, sanitation and hygiene (WASH) sectors. Food security and livelihoods projects are scarce.

A joint World Food Programme/UNICEF resilience project was designed based on the key findings of the Strengthening Nutrition Security Nutrition Causal Analysis conducted in 2015. However, years of multi-sector programming did not bring a desired effect and the GAM prevalence in Dolow remained critically high. Therefore, the need to better understand the key drivers of undernutrition and to adapt response programming more effectively remained relevant. In November 2019, a more comprehensive analysis was requested by UNICEF, and Action Against Hunger UK conducted a Link Nutrition Causal Analysis (NCA) (See Box 1).

Box 1 About Link NCA

Link NCA (Nutrition Causal Analysis) is an established participatory and results-oriented methodology for analysing the multi-causality of undernutrition to inform context-specific nutrition-sensitive programming. The Link NCA methodology was developed to help researchers to discover the causal pathways of undernutrition, considering multiple sources of data including statistical associations with a variety of individual and household indicators that depict the broader environment, changes in the patterns of undernutrition over time and seasonally and recommendations for programming based on the risk factors likely to be the most modifiable by stakeholders.

To answer these questions, Link NCA studies employ a mixed-methods approach, combining both qualitative and quantitative research methods, and draw conclusions from a synthesis of the results. The Link NCA is carried out in the following five steps: the preparatory phase, the identification of hypothesised risk factors and pathways, community-level data collection, a synthesis of the results and building technical consensus and communicating results and planning for a response.

For more information see <https://www.linknca.org/>

Methodology

The main objective of this Link NCA study was to identify the drivers of persistently high levels of wasting in order to strengthen the holistic programmatic response to this burden. The focus on wasting was expanded to include stunting over the course of the study to consider the potential similarities or differences in the risk factors associated with both nutrition outcomes.

Due to the COVID-19 pandemic, the preparatory phase of the study spanned from February to December 2020, the review of available literature on risk factors of undernutrition in the study zone being conducted twice to capture all the available evidence that could have been published between the two runs. With ethical approval issued in November 2020, the hypothesised risk factors were presented, examined and validated for field testing during the Initial Technical Workshop organised via a teleconference on 13th December 2020.

The qualitative study lasted four weeks, spanning from 1st April 2021 to 2nd May 2021. It comprised of an in-depth inquiry including 32 focus group discussions, 29 semi-structured interviews and 14 observations with a total of 285 participants, of which 111 were female. All the qualitative data was recorded manually in a notebook and reproduced electronically. The data was grouped by themes and analysed using qualitative content analysis methods.

For financial reasons, the usual quantitative survey was replaced by secondary quantitative data analyses using datasets provided by the Food Security and Nutrition Analysis Unit (FSNAU), covering the Gu and Deyr¹ seasons between 2014 and 2020. Each dataset included a range of

indicators including anthropometrics and health status for children 6-59 months and their caregivers, household food security and dietary diversity indicators. The exact indicators differed by dataset. The number of observations (children 6-59 months) after the exclusions of World Health Organization (WHO) flags² is presented in Table 1.

Both bivariate logistic and linear regression were undertaken using STATA software to determine the associations between the various risk factors and child nutrition status (being stunted or wasted).

The final stage involved the synthesis and triangulation of the data which included the design of causal pathways based on community perceptions and all the generated evidence.

Findings

The analyses undertaken during this Link NCA study identified 17 risk factors believed to have an impact on the prevalence of undernutrition in the study zone. Following a triangulation of data from diverse sources,³ four risk factors were identified as having a major impact, eight risk factors were classified as having an important impact and five risk factors were judged to have a minor impact on the incidence of undernutrition in the zone of study. Among the major risk factors, two were identified in the sector of mental health and care practices, namely **non-optimal breastfeeding practices** and **non-optimal complementary feeding practices**, while the other two major risk factors, **low access to income sources** and **low coping capacities**, were identified in the sector of food security and livelihoods.

As per community explanations, the dominant pathway to undernutrition likely takes its roots

in limited access to income sources which triggers inadequate coping strategies with an effect on the dietary intake of the household, mostly affecting women of reproductive age and children under five years of age. Limited access to income sources coupled with low social support for women increases women's workload as they absorb income-generating responsibilities subsequently distancing them from childcare. Women's workload can be further exacerbated by repetitive pregnancies with negative consequences on their nutritional status which in turn lowers their capacity and/or their perception of their capacity to breastfeed. Inadequate childcare practices then translate into greater child vulnerability to diseases and inadequate nutritional intake and consequently undernutrition. This pathway resembles the pathway designed for the SO-19 livelihood zone covering IDP settlements in the Kahda district during a Link NCA study in 2019.⁴

Based on available data provided by FSNAU, the calculation of the statistical associations between individual risk factors and the nutritional status of children in the surveyed households allowed researchers to differentiate between the risk factors of wasting and stunting (See Table 2).

Common risk factors for wasting (based on at least one index: weight for height z-score (WHZ) or mid-upper-arm circumference (MUAC) or WHZ and/or MUAC) and stunting include a **male child**,⁵ the occurrence of morbidities – such as **diarrhoea** or **pneumonia** – and the household's dependence on **gifts/zakaat**⁶ as their primary source of income. Children younger than 24 months also had higher odds of being wasted or stunted. On the other hand, children were less likely to be wasted or stunted if their household **owned land** or declared **petty trade** as their primary source of income.

Key risk factors for wasting (based on at least one index: WHZ or MUAC or WHZ and/or MUAC) – but not stunting included **fever** or **measles**, **above average household size** (≥ 6 members) and income from **camel or cattle sales**. On the other hand, children were less likely to be wasted if they received a **polio vaccination**, **vitamin A supplementation** or their household declared **self-employment** as their primary source of income. The **mother's education** was associated

¹ Rainy seasons: The Deyr (Oct-Dec) season rainfall is usually of shorter duration and less amount and intensity compared to the Gu (Mar-May) season rainfall but both are beneficial in supporting seasonal agricultural activities and replenishing water and pasture resources.

² The WHO flags aim to remove extreme (i.e., likely implausible) values that are more likely to be measurement error rather than reflect true measurements. The range for suggested outliers varies according to the indicator:
HAZ <-6, HAZ >+6; WAZ <-6, WAZ >+5; WHZ <-5, WHZ >+5.

³ Per Link NCA guidelines, the following sources are consistently included in the triangulation exercise: scientific literature compiled in Link NCA "Pathways to Undernutrition", a secondary data review relevant for the study zone, technical experts' rating during an Initial Technical Workshop, statistical analyses – in this case based on FSNAU datasets, community rating of risk factors collected during the qualitative inquiry and qualitative team rating.

⁴ Conducted by Action Against Hunger Somalia for the BRCIS consortium in the SO-19 livelihood zone of the Kahda district in 2019.

⁵ The vulnerability of male children towards wasting was most pronounced during the Deyr seasons of 2014 and 2016.

⁶ Cash, food-in-kind, animals, etc.

Table 1 Summary of observations per dataset after the exclusion of WHO flags

Final sample	Deyr			Gu		
	WHZ	HAZ	WAZ	WHZ	HAZ	WAZ
Year						
2014	827	833	833			
2015	714	715	715	861	867	866
2016	706	707	707	633	631	636
2017	576	576	576	623	623	622
2018	709	710	710	626	625	627
2020	622	621	624	613	611	615

WHZ: weight-for-height Z-score, HAZ: height-for-age Z-score, WAZ: weight-for-age Z-score

with a decreased likelihood of having a wasted child based on WHZ but an increased likelihood of wasting by MUAC.

Key protective factors for stunting but not wasting (based on at least one index: WHZ or MUAC or WHZ and/or MUAC) include the **mother's MUAC** and a consumption of **fruits** and **organ meat**. Children living in households with a **woman decision-maker** were potentially less likely to be stunted.

Discussion

The Link NCA study in the Dollow IDP settlements generated substantial evidence demonstrating considerable overlaps between the risk factors of wasting and stunting. However, not all risk factors were consistently relevant for each studied nutrition outcome. The observed differences need to be studied, especially in case of reverse or counter-intuitive associations, and properly considered in future programming. In the case of Dollow, for example, targeted interventions for above average sized households may be more effective in the fight against wasting rather than stunting while the support of land ownership might be a beneficial tool for tackling multiple nutrition deficits and decreasing a household's vulnerability and dependency on aid.

In addition, the Link NCA study in Dollow was the first of its kind with a longitudinal perspective. Logistic and linear regressions were undertaken for each dataset separately as well as for a combined dataset that included all data from 2014 to 2020. This allowed the exploration of the relationships between nutritional outcomes and personal and household indicators of more than 8,000 children under five years of age while considering the potential seasonal variations in those relationships. For example, children who had pneumonia, fever or measles in the two weeks prior to data collection were more likely to be wasted in the Deyr season while the consumption of nutritious foods such as vitamin A rich fruits and vegetables was more likely to be protective of wasting during the Gu season. As such, the study's findings will not only allow the prioritisation of interventions tailored to the population's needs but also help implementing partners to roll these out during periods of their increased vulnerability. In other words, a solid base of evidence around child's vulnerability within the 1,000 days' window reinforced the need for supporting vulnerable households/persons (e.g., male children, children from above-average sized households, children at heightened risk of child morbidities) to adopt and maintain optimal child care behaviours especially during the Deyr season.

Recent research from Chad (Marshak et al, 2021) suggests that future programming and research must better understand and incorporate the seasonal nature of both wasting and all its drivers in order to be effective. The experience harnessed during the Link NCA study in the Dollow IDP settlements supports these conclusions while it also unveiled the potential of existing data to feed into longitudinal analyses. In contexts where annual surveys or effective surveillance systems are in place, additional primary data collection, tailored to the specific needs of in-depth studies, which spans multiple years may be too slow to advise meaningful, multi-sector program-

Table 2 Notable statistical associations between risk factors and wasting and stunting demonstrated by logistic regression (All FSNAU data combined 2014-2020)

Risk factor	N	Wasting (WHZ)	Wasting (MUAC)	Wasting (MUAC and/or WHZ)	Stunting
		Children 6-59 months	Children 6-59 months	Children 6-59 months	Children 6-59 months
Indicator	(%)	Odds Ratio [95% CI]	Odds Ratio [95% CI]	Odds Ratio [95% CI]	Odds Ratio [95% CI]
Male child	4,303 (50.9)	1.3** [1.14-1.48]	0.77* [0.65-0.93]	1.17* [1.03-1.33]	1.38** [1.27-1.50]
Age group <24 months	2,967 (35.1)	1 [0.87-1.13]	9.32** [7.24-11.99]	1.5** [1.32-1.70]	1.74** [1.53-1.97]
Above average household size (> =6 members)	3,001 (41)	1.17* [1.03-1.32]	0.99 [0.81-1.22]	1.15* [1.03-1.29]	0.93 [0.84-1.04]
Income from: Sales of camel and cattle	7 (0.2)	2.93* [1.09-7.82]	1 [1.00-1.00]	2.45 [0.92-6.54]	1 [1.00-1.00]
Income from: Petty trade	604 (16.8)	0.95 [0.72-1.25]	0.6* [0.39-0.92]	0.87 [0.68-1.12]	0.74* [0.59-0.92]
Income from: Gifts/Zakaat (cash, food-in-kind, animals, etc.)	147 (4.1)	1.36 [0.87-2.13]	1.71* [1.10-2.67]	1.37 [0.95-1.97]	1.5* [1.06-2.14]
Has assets: land	1,705 (47.4)	0.8* [0.64-0.99]	0.85 [0.61-1.18]	0.84 [0.67-1.04]	0.83* [0.70-0.99]
Diarrhoea in last 2 weeks	431 (5.1)	1.41* [1.08-1.83]	5.18** [3.73-7.18]	2.02** [1.55-2.63]	1.58** [1.26-1.97]
Pneumonia in last 2 weeks	414 (4.9)	1.12 [0.85-1.48]	3.99** [2.76-5.76]	1.61** [1.23-2.12]	1.44* [1.14-1.81]
Fever in last 2 weeks	735 (8.7)	1.49* [1.15-1.94]	2.13** [1.55-2.94]	1.53** [1.21-1.93]	1.13 [0.93-1.37]
Measles in last 2 weeks	59 (0.7)	1.22* [1.01-1.47]	1.42** [1.15-1.74]	1.29 [0.98-1.69]	1.05 [0.85-1.29]
Morbidity in last two weeks	1,718 (20.2)	1.51** [1.25-1.82]	3.31** [2.59-4.23]	1.77** [1.47-2.12]	1.18* [1.02-1.37]
WASH: Toilet used by most members of the household	278 (8.8)	1.53 [1.00-2.34]	2.31* [1.06-4.99]	1.53 [0.99-2.37]	1.18 [0.76-1.83]
Mother has any education	4,020 (59.4)	0.79** [0.69-0.89]	15.31** [9.70-24.18]	1.1 [0.98-1.24]	3.34** [2.86-3.91]

*p <.05 **p <.001

Green shading indicates a significant positive association and red shading indicates a significant negative association

ming in the immediate term. Therefore, where such data exists, it should be appropriately explored and used to build a case for further research.

Limitations

While the use of secondary datasets yielded meaningful supportive evidence, it was accompanied with a trade-off, especially in terms of indicator selection. Considering the priority focus of the FSNAU datasets on food security and nutrition, the supporting evidence for the gender and WASH sectors was scarcer. This essentially created evidence gaps during the design of the causal pathways resulting in a disproportionate representation of certain risk factors at the expense of others which might have been invoked during the qualitative inquiry.

Conclusion

The Link NCA study in the Dollow IDP settlements confirmed the observations from previous studies that risk factors of undernutrition are context-specific and do not automatically apply to all nutrition outcomes. While the overlap between the risk factors of wasting and stunting in Dollow was considerable, it could not have been predicted based on the available analyses. The analyses included in the Link NCA study will allow the implementing partners to adjust the programmatic priorities so that they address the identified key drivers of undernutrition and the programmatic gaps as outlined by the participating commu-

nities. This may include, among others, more development-type programming which would enhance in a sustainable manner their capacity to provide for their households instead of depending on emergency humanitarian assistance. Particular attention should be given to gender-sensitive programming, considering the practical implications of women-centred targeting on their workload and consequent capacity to follow recommendations on optimal childcare practices.

Detailed findings can be found in the full report which is available at

<https://linknca.org/etude/dollow.htm>

For more information, please contact the Link NCA Technical Unit at Action Against Hunger UK/ Action Against Hunger France at link-nca@actioncontrelafaim.org

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Finding the best criteria to identify children at high risk of mortality

This article is a summary of the following paper:

Khara T, Myatt M, Sadler K, Bahwere P, Berkeley J, Black R (TBC) Anthropometric criteria for best identifying children at high risk of mortality: A pooled analysis of 12 cohorts [submitted for publication].

Background

Previously published research has highlighted that being concurrently wasted and stunted (WaSt), even at moderate levels, is associated with considerable excess mortality in children comparable to that associated with severe wasting (McDonald et al, 2013). Given this high level of mortality risk, the question has been raised as to whether these children should be included in therapeutic feeding services if they are not already reached, as well as how these children might be identified at the community level for treatment.

To explore these questions and to understand how anthropometry can be used to identify children with WaSt who have a high risk of mortality, an analysis of data from a community-based cohort study in untreated children in Senegal in 1983-84 was conducted and published by ENN, with the Wasting and Stunting Technical Interest Group (WaSt TiG), in 2018. This analysis suggested that two anthropometric measures commonly used at community level – weight-for-age z-score (WAZ) and mid-upper arm circumference (MUAC) – were independently associated with near-term mortality and that if severely low MUAC (<115 mm) was used in combination with WAZ <-2.8, all deaths associated with severe wasting (weight-for-height z-score (WHZ) <-3) and with WaSt could be predicted in the studied context (Myatt et al, 2018). The paper concluded that many of these deaths could likely be avoided if those cases were included for treatment in community-based management of acute malnutrition programmes and suggested that therapeutic treatment may achieve a higher impact on averting mortality if a combination of WAZ and MUAC admission criteria was to be used (in addition to the presence of nutritional oedema). However, implications related to increased caseloads were noted.

Recognising that the results of a single study were unlikely to be valid across all contexts, this follow-on paper aims to expand the same analysis to 12 similar mortality cohorts of largely untreated children, captured when treatment options were not available. It reviews anthropometric criteria for the identification of children at elevated mortality risk across several parameters and explores the potential programmatic implications of applying the most appropriate criteria in therapeutic treatment programmes.

Methods

Data from 12 cohort study datasets from 12 different low-income countries, which included data on children aged 6-59 months collected between 1977 and 2013, was analysed. The original studies were all large prospective cohort studies or follow-up studies within randomized trials examining various health and nutrition interventions and

outcomes in Africa, the Americas, Asia, and the Pacific. The outcome of interest for this analysis was near-term mortality, defined as death within six months of anthropometric assessment.

Ten anthropometric case definitions were proposed for analysis with each evaluated against multiple evaluation criteria for its suitability for use in identifying the most at-risk children for entry into therapeutic feeding programmes. The ability of each case definition to predict mortality within six months of anthropometric assessment was assessed. Analysis was performed separately for all children, children aged 6-23 months and those aged 24-49 months. Evaluation criteria included sensitivity (ability to detect deaths), specificity (ability to exclude those who do not go on to die), informedness (the probability of an informed decision being made as opposed to a random guess), face validity (the extent to which the definition appears to measure what it is intended to measure), inclusivity (the possibility of identifying all, or nearly all, children with severe anthropometric deficits who are likely to die within six months of measurement), and compatibility/ practicability (the degree to which a case definition is compatible with current practices, tools, and case-defining thresholds). The operational consequences of the findings were modelled by exploring the effects on programme caseload and workload for health staff.

Results

Of the 10 anthropometric case definitions analysed, three measures, namely MUAC<115mm, WAZ<-3 and MUAC<125mm, had the highest level of informedness in predicting mortality. A combined case definition (i.e., MUAC <115mm or WAZ <-3) was better at predicting deaths associated with WHZ<-3 and WaSt than a single WAZ<-3 definition. When assessing all criteria, it appeared that WAZ<-3 and MUAC<115mm, or WAZ<-3, performed best, also meeting, for example, criteria of compatibility/ practicability (particularly as MUAC and WAZ are both measures commonly used at community level), and face validity. It was found that the simulated caseload for programmes admitting on MUAC <125mm was 5.23 (95% CI = 2.76, 25.99) times larger than programmes admitting on MUAC <115mm and 3.01 (95% CI = 1.48, 15.33) times larger if admissions were based on MUAC<115mm or WAZ<-3.

When different levels of risk within the subgroups of children identified was calculated and used to stratify the group into varying intensities and durations of treatment, it was found that the simulated workload for programmes admitting on MUAC <115mm or WAZ<03 was 1.87 (95% CI=1.03, 14.17) times larger than programmes admitting on MUAC <115mm alone.

Discussion

This analysis of 12 cohorts concurs with the findings from the 2018 Senegal analysis, concluding that a combined case definition of MUAC<115mm or WAZ <-3 performs best against all evaluation criteria and can predict nearly all deaths associated with severe anthropometric deficits (including WHZ<-3 and WaSt). Weight-for-age measures are used in many countries within several community-based child health and nutrition interventions, such as growth monitoring programmes and integrated management of childhood illnesses interventions. Thus, a case definition of WAZ <-3 could potentially be used within these established platforms for the identification of children at a high-risk of mortality requiring nutritional treatment. Furthermore, given that the combined case definition can detect all near-term deaths associated with WHZ<-3, the authors suggest that its use could remove the need for the current facility-based WHZ admission criterion by already including the most at-risk children in that group. This study illustrates that the use of the combined case definition would mean an increase in programmatic caseloads. However, the findings suggest that different levels of treatment intensity may be appropriate for some of the children identified. Further operational research is required to determine the appropriate treatment intensity levels.

A strength of the findings of this study is that it is based on the analysis of many datasets of untreated children in different contexts. However, there are several limitations including a potential bias introduced by loss to follow-up masking deaths within the cohorts, as well as the possible bias introduced by the absence of data on oedema.

Conclusion

A combined case definition (MUAC<115mm or WAZ<-3) has the ability to detect all, or nearly all, deaths associated with severe anthropometric deficits. The use of such definitions in existing community-level platforms suggests that therapeutic feeding programmes may achieve higher impact with this case definition. However, there remain questions related to the intensity of treatment required and also operational considerations that require further discussion.

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The relationship between wasting and stunting in young children: A systematic review

This is a summary of the following paper:

Thurstans S, Sessions N, Dolan C, Sadler K, Cichon B, Isanaka S et al (2022) *The relationship between wasting and stunting in young children: A systematic review. Maternal & Child Nutrition, 18, e13246.*

<https://pubmed.ncbi.nlm.nih.gov/34486229/>

This article was written by **Susan Thurstans**, PhD candidate at the London School of Hygiene and Tropical Medicine and consultant to ENN on the Wasting and Stunting project, and **Natalie Sessions**, Senior Nutritionist at ENN.



A mother and her baby participate in a nutrition activity in their community in Bertoua, in the east of Cameroon

GLOBAL

Key messages:

- A large number of children experience concurrent wasting and stunting – a condition that carries a high mortality risk – and this can vary by context, although fragile and conflict-affected states appear to be disproportionately affected.
- Wasting has been found to lead to stunting and, to a lesser extent, stunting to lead to wasting, although the physiological mechanisms are less clear for this direction of the relationship.
- Research is needed to determine if the treatment of wasting could be adapted to better lay the foundation for linear growth.

Background

In 2014, the Wasting and Stunting Technical Interest Group (WaSt TIG) published a technical briefing paper on the relationship between wasting and stunting. Building on this, a systematic review was conducted to explore evidence generated since 2014 to understand the current evidence on the relationship between wasting and stunting and the implications of the relationship on interventions to improve child health, nutrition and survival.

Methods

Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines were followed and search terms were identified to describe wasting and stunting and the relationship between the two conditions and run through Medline, Embase and global health databases. Studies addressing wasting and stunting separately or studies that did not report on either condition in relation to the other were excluded. Three main themes were identified including a physiological understanding of the similarities in wasting and stunting, the interrelationship between the two conditions and the implications of this relationship. A total of 45 studies and reports were included.

Findings

Interconnected physiological processes in wasting and stunting

Wasting and stunting both occur when nutrient intakes are insufficient to meet the requirements for growth and/or to support the immune response to infection. When this happens, the body

draws on nutritional reserves, mainly fat and muscle. The loss of fat and muscle, the interaction with infection and the ensuing reduced production of hormones such as leptin have all been identified as important physiological processes linking wasting and stunting but further research is warranted. In particular, further work is needed to better understand the role of gut health/inflammation, body composition and its relationship with anthropometric indicators and functional outcomes, the contribution of lean and fat tissue during and after recovery from wasting and the role of environmental factors.

The timing of wasting and stunting

The targeting of nutrition interventions often focuses on children from 6-59 months of age. However, evidence shows that wasting and stunting incidence peaks between birth and three months, with implications for further deterioration in infancy and childhood. With a significant degree of child undernutrition also established before birth, greater coordination between interventions targeting adolescent girls and mothers and those aiming to prevent child undernutrition is needed.

Evidence for the relationship between wasting and stunting

Analysis of both population-level cross-sectional datasets and longitudinal data is supportive of a link between wasting and stunting that is more than just chance. Likewise, within treatment programmes for severe acute malnutrition (SAM), evidence of a relationship is also apparent in that children with SAM are often also stunted.

Research has also shed light on the processes involved in this relationship. Wasting has been found to lead to stunting and, to a lesser extent, stunting to lead to wasting, although the physiological mechanisms are less clear for this direction of the relationship. In the case of wasting leading to stunting, evidence suggests that the body's response to weight faltering is to slow or halt linear growth until weight is gained and any infection is treated. These findings highlight the importance of integrated medical and nutritional care of children receiving wasting treatment to ensure the effects of wasting on linear growth are minimised. Seasonal patterns also contribute. Research from the Gambia (Schoenbuchner et al, 2019) showed that wasting in a child's first wet season (hungry season) increased the odds of wasting in their second wet season by a factor of 3.2, even if they had recovered in the intervening harvest period. Likewise, infants born at the start of the wet season did not catch up in weight to the same extent as their peers born in other months and experienced both more wasting during childhood and an increased risk of becoming stunted by two years of age.

Concurrent wasting and stunting

A large number of children experience concurrent wasting and stunting and this can vary by context. Fragile and conflict-affected states appear to be disproportionately affected with higher rates of concurrent wasting and stunting than stable contexts (Khara et al, 2018). A number of studies also show that wasting, stunting and concurrent wasting and stunting are all more prevalent in boys than girls, and in younger children between 12 and 30 months of age.

Mortality implications of concurrent wasting and stunting

Children with concurrent wasting and stunting have been shown to have a 12-fold increased risk of mortality compared with children who are not wasted or stunted (McDonald et al, 2013). This highlights the need to focus on considerations around the risk of death within treatment programmes.

Wasting treatment outcomes and stunting

The findings regarding the response to SAM treatment for children who are both wasted and stunted are inconsistent although, overall, evidence suggests that outcomes are suboptimal for children with concurrent wasting and stunting. Treatment programmes should be optimised to identify those children most at-risk. Research is needed to determine if the treatment of wasting could be adapted to better lay the foundation for linear growth.

Anthropometric indices and the identification of risk

Research is ongoing into the most effective identification of children at high risk of mortality. Evidence suggests that the combined use of weight-for-age z-scores (WAZ) and mid-upper arm circumference (MUAC) identifies all near-term deaths (i.e., within six months of measurement) associated with concurrent wasting and stunting.

The use of MUAC and WAZ is also effective in identifying high-risk infants under six months of age. This has important implications in reaching the most vulnerable children in a way that is programmatically practical. These findings indicate the need for further operational research into the most optimal anthropometric identification and assessment of undernutrition.

Conclusion

A significant and still-growing body of evidence supports the existence of a strong relationship between wasting and stunting with important implications for policy and practice. Wasting and stunting, driven by common factors, frequently occur in the same child, either at the same time or through their life course, with important interactions between them. This demonstrates the need for a more integrated approach to prevention and treatment strategies in order to interrupt this process and halt the spiralling of vulnerabilities associated with early growth deficits. To

achieve this, further progress is needed to overcome the divide in undernutrition policy, programme, financing and research initiatives.

For more information, please contact Susan Thurstans at susan.thurstans@lshtm.ac.uk

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Research Summary

Understanding sex differences in childhood malnutrition

This is a summary of the following paper:

Thurstans S, Opondo C, Seal A, Wells J, Khara T, Dolan C et al (2021) *Understanding sex differences in childhood undernutrition: A narrative review*. *Nutrients*, 14, 5, 948. <https://www.mdpi.com/2072-6643/14/5/948>

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oped at birth and potentially better able to withstand adverse conditions.

Male foetuses are, on average, larger than female foetuses between the eighth and twelfth week of gestation, suggesting that a genetic mechanism may underlie sex differences in foetal size. It is thought that male foetuses grow faster in the womb from the early stages of gestation and that males' placentas may be more 'efficient' than those of females. Male placentas are smaller – by ratio to birthweight – to accommodate a larger foetus in the womb and so male placentas potentially have reduced reserve capacity (Eriksson et al, 2010). This accelerated growth may be beneficial in the presence of an abundant food supply but this makes males vulnerable to food shortages.

Similarly, evidence suggests that male foetuses are more responsive to a mother's gestational diet than female foetuses for whom development seems more closely associated with the mother's longer-term nutritional status. Findings from a study conducted in Nepal showed that in a population with high levels of maternal undernutrition, mothers of sons did not demonstrate greater nutrition reserves to meet the extra absolute energy costs of nourishing males when compared to females (Saville et al, 2021). Thus, boys demonstrated higher rates of stunting and lower head girths during early life.

Endocrine/immune factors

Overall morbidity and mortality rates are higher in males compared to females throughout life. One explanation for this is a stronger immune response and capacity to produce antibodies in girls. Hormonal systems also differ between boys and girls and the interaction between sex hormones and environmental factors has consequences for energy consumption, nutritional requirements and vulnerability to infectious and non-communicable diseases.

Infant and young child feeding

Methods of infant feeding have consequences for growth and development with some evi-

Background

A recent systematic review and meta-analysis on sex differences in malnutrition in children under five years of age (Thurstans et al, 2020) found that, in most settings, boys were more likely to be wasted, stunted and underweight than girls. This research summary aims to understand the possible origins, pathways and consequences of these sex differences which may have implications for policy and practice.

Demographic variations in malnutrition by sex

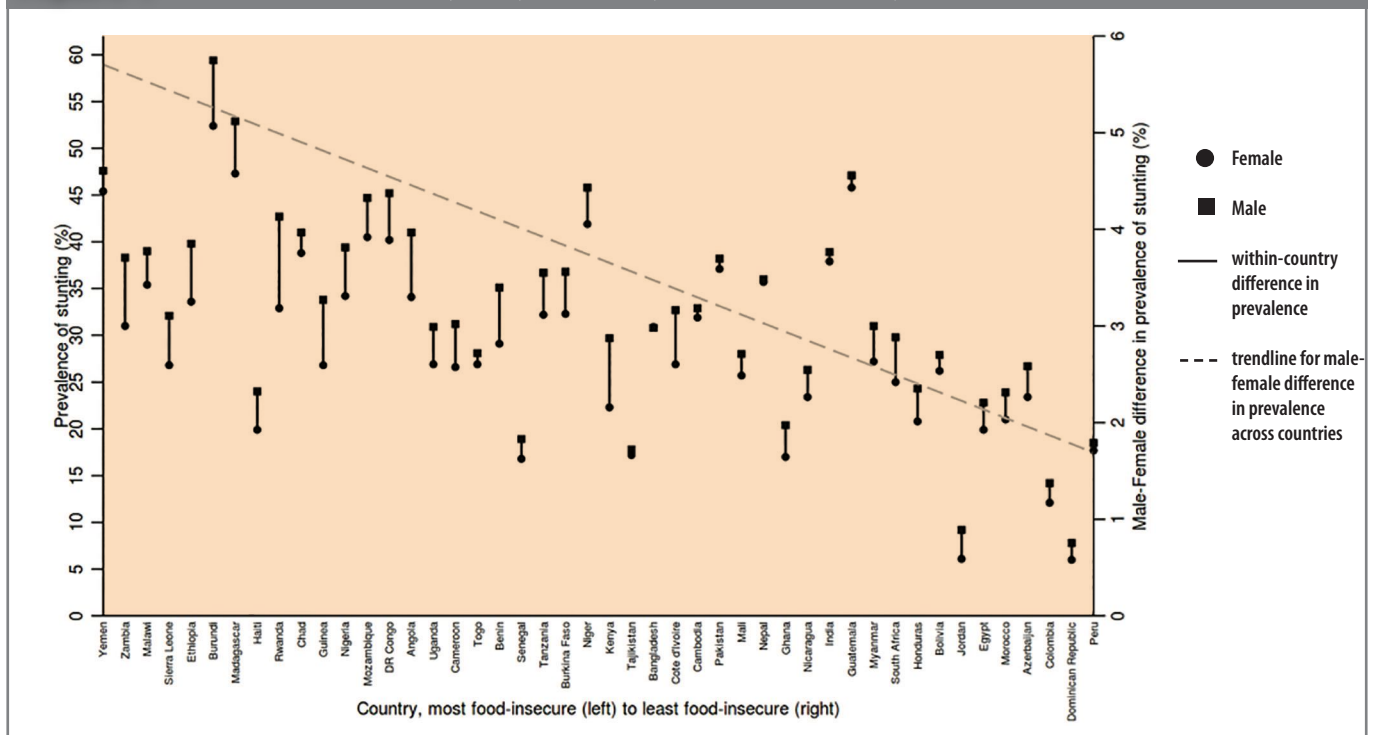
A recent analysis of Demographic and Health Survey (DHS) data from Africa found that sex differences are more pronounced in children with concurrent wasting and stunting compared with those with only one deficit (Garenne et al, 2021). Sex differences may also be more pronounced among lower socio-economic groups and at higher levels of food insecurity. For example, DHS data from 16 countries in sub-Saharan Africa (Wamani et al, 2007) showed that

sex differences in stunting were more pronounced as socio-economic strata declined. A separate analysis in this review found the difference in prevalence between boys and girls was increased with decreasing wealth so that there was a trend towards less pronounced sex differences in wealthier countries. While the pattern was not uniform, and the comparison would benefit from more in-depth analysis, it suggests that addressing socio-economic inequalities may contribute to reducing sex differences in malnutrition (Figure 1).

Potential explanatory factors for sex differences

Maternal and newborn factors

The observed sex differences appear to originate, at least in part, in utero. Male foetuses are known to be at an increased risk of poor outcomes compared to female foetuses. It is estimated that a newborn female is physiologically similar to a male at four to six weeks of age (Kraemer et al, 2000), suggesting that females are more devel-

Figure 1 Prevalence of stunting only in boys and girls by level of food insecurity

Data sources: Country food security scores from the Global Food Security Index found at: <https://foodsecurityindex.eiu.com/Index>. Stunting prevalence data from the DHS StatCompiler found at: <https://www.statcompiler.com/en>

dence to suggest that the quality and quantity of milk produced by breastfeeding mothers, or taken in by infants, can vary by sex. However, the evidence is limited and sample sizes are often small. In addition, a number of studies have shown that boys often receive complementary food earlier than girls, either because boys are perceived as being hungrier or because breastmilk is viewed as inferior to complementary foods and boys may be prioritised for the 'superior' option.

Gender perceptions

In addition to feeding and care practices, the social and economic circumstances in which families live and in which children are raised influence health and nutrition outcomes through variations in how children are fed, what services they can access and the wider health and disease environment to which they are exposed. The roles that boys and girls assume within a community, and the values attached to them, might affect both the nutritional inputs available to them and their exposure to disease and infection. For example, gender roles can influence where boys and girls spend their time and, in turn, the environment to which they are exposed and their access to food.

Indicators of malnutrition

How malnutrition is assessed and defined has potential consequences for understanding how sex differences play out. The 2006 World Health Organization growth standards use sex-specific growth references. However, what is not certain is whether the sex differences observed in this original reference population are representative of sex differences in all other populations, particularly those living in situations of deprivation. In other words, it is unclear if a specific z-score (< -3, for example) in a girl or boy of the same

age corresponds to the same physiological impact in both sexes and how the distribution of fat and fat-free mass affects this. In contrast, the use of mid-upper arm circumference (MUAC) is based on a single cut-off point for girls and boys. The fact that boys are bigger in absolute terms, and have higher energy needs to grow along given centile lines, could mean that the same absolute supply of energy would only meet the requirements of a boy with a thinner arm compared to a girl. Thus, it has been suggested that using a single cut-off point for MUAC may result in the overestimation of wasting in girls and the underestimation of wasting in boys (Tadesse et al, 2017).

Possible implications of sex differences for addressing malnutrition

Although the evidence clearly shows a higher risk of wasting, stunting and underweight in boys compared with girls, more detailed analysis is needed to better understand the implications for health and nutrition. In a study of children in Senegal with concurrent wasting and stunting, sex differences in mortality were not significant after controlling for stunting and wasting (Garenne et al, 2019).

In relation to treatment, evidence is limited but might indicate longer recovery times in boys. Data from a malnutrition treatment programme in Uganda showed that girls had an increased probability of recovery than boys although the difference was not significant (Odei Obeng-Amoako et al, 2020).

Conclusion

This review highlights the complexity and, at times, conflicting nature of the evidence on the determinants of sex differences on malnutrition. Further

investigation into the pathways and drivers of these differences is needed to inform appropriate programming and policy. While these findings should not undermine the efforts to address other areas of gender inequity, programme staff and policy-makers should be aware of boys' vulnerability in relation to infant and child survival, nutrition and development thus facilitating the accurate interpretation of data to ensure that all vulnerable children are identified and targeted in programmes.

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Lactating woman
eating fortified
blended flour

A reflection on the 2021 *Lancet* Maternal & Child Nutrition Series through a WaSt lens

This article provides a summary of the *Lancet* Maternal & Child Nutrition Series to date, reflecting upon the 2021 series from the perspective of the Wasting and Stunting Technical Interest Group

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Key messages:

- In the earlier two *Lancet* Maternal & Child Nutrition Series in 2008 and 2013, stunting and wasting were discussed independently.
- In the latest Series in 2021, the overlap between these two forms of undernutrition was considered which strongly aligns with research done by the Wasting and Stunting Technical Interest Group.
- The new focus on the interrelationships between wasting and stunting provides further rationale for more programmes and policies to consider joint programming across the different manifestations of undernutrition.

The three *Lancet* Series on maternal and child undernutrition represent milestone publications for those working in public health and nutrition. They provided authoritative, influential collections of papers where current evidence was reviewed and the implications for programming outlined (see Box 1 for a summary of the evidence-based interventions recommended in each Series).¹

Given the significant influence of these Series on practice and policy, it is an opportune time to explore what has been said about the relationship between wasting and stunting in the latest Series and what gaps remain. In this article we reflect on the 2021 Series' first paper (Victora et al) from the perspective of the Wasting and Stunting Technical Interest Group (WaSt TIG).²

The first paper by Victora et al (2021) describes analyses of national survey data from 50 low- and middle-income countries (LMICs) taken from two time periods which the authors broadly categorised into surveys from 2000 and those since 2015 (Victora et al, 2021). They summarise trends in nutrition indicators over the 15 years. Although associations between wasting and stunting are not referred to explicitly in the key messages panel, the topic is brought out clearly in the article summary and is covered in detail in the paper's narrative. Indeed, reference was made in this paper to an article written by members of the WaSt TIG that summarises many of the key concepts emerging from the group's research (Wells et al, 2019).

This marks an encouraging development since the first two *Lancet* Series where stunting and wasting were discussed independently and where the overlap between these two forms of undernutrition was not considered. The new focus on the interrelationships between wasting and stunting provides further rationale for more programmes and policies to consider joint programming and policies across the different manifestations of undernutrition.

Some of the key points from Victora et al are:

Increased mortality risk for children concurrently affected by wasting and stunting (WaSt):

Three studies (each of which was co-authored

by members of the WaSt TIG) are used to back up this statement. The first (Garenne et al, 2019) looks at a historic cohort of children in Senegal. Concurrent WaSt was a strong predictor of mortality explaining 51% of the mortality in the cohort. The second study (McDonald et al, 2013) is a meta-analysis of 10 cohorts from LMICs. Children who were wasted, stunted and underweight had more than 12 times the mortality risk of children with no anthropometric deficits. The third is a pooled analysis of 35 longitudinal cohorts (Mertens et al, 2020). Concurrent WaSt at 18 months of age was strongly associated with later mortality in the cohorts (RR=4.8, 95% CI: 3.9, 5.9).

Prevalence of concurrent WaSt:

The authors calculated the prevalence of concurrent WaSt in the 50 countries at both survey time points. This is something that is not yet routinely done with survey data, or in global estimates, despite the heightened mortality risk of those with concurrent WaSt and the fact that prevalence of concurrent WaSt can be similar, if not higher, than the prevalence of severe wasting. For example, the 2021 Joint Child Malnutrition Estimates (UNICEF, the WHO, World Bank Group, 2021) describe that wasting and stunting can co-exist but do not provide estimates for concurrent WaSt. In the *Lancet* article, the prevalence of concurrent WaSt is portrayed graphically and then described within its own narrative section.

Concurrent WaSt prevalence was 7.0% in the surveys from 2000, reducing to 4.7% in the 2015 surveys (low-income countries only; prevalence of concurrent WaSt was very low in middle-income countries). The authors put this into the context of other estimates produced by members of the WaSt TIG, quoting Khara et al's (2018) meta-analysis of survey data from 84 countries where the pooled prevalence of concurrent WaSt was 3.0%, 95% CI [2.97, 3.06] with peak timing of WaSt concurrence at 12-35 months of age. They also highlighted recent analyses of regional differences from Mertens et al (2020) which showed

¹ A brief summary of the *Lancet* 2021 Series papers' themes can be found in a recent FEX snapshot article: <https://www.enonline.net/fex/65/lancetundernutritionseries>

² More information can be found on the work of the WaSt TIG in the accompanying article and online at <https://www.enonline.net/ourwork/reviews/wastingstunting>

that concurrent WaSt prevalence was particularly high in South Asia (8%) with peak prevalence at age 12-18 months.

Wasting increases the risk of subsequent stunting:

Two studies were referenced to support the observation that wasting increases the risk of later stunting although neither of the study findings was elaborated upon. The first study (Schoenbuchner et al, 2019) used four decades of longitudinal growth data from The Gambia. The authors found that being wasted increased the odds of being stunted later (OR: 3.2; 95% CI: 2.7, 3.9). The second study (Richard et al, 2012) was an analysis of eight cohort studies which suggested a lagged effect between an episode of wasting and subsequent linear growth with the strongest adverse effect on linear growth found when the episode of wasting occurred in the preceding six months.

A more recent study (Mertens et al, 2020) (not referenced by Victora et al) also provides robust longitudinal data to bolster evidence on this topic. The analysis of 18 longitudinal cohorts suggested that children who were ever wasted in the first six months of life were 1.8 (95% CI: 1.5, 2.3) times more likely to be concurrently WaSt between ages 18-24 months. Given the size of the datasets in this analysis, it is an important paper that underscores the associations between prior episodes of wasting and later vulnerability to growth failure (both wasting and stunting).

Other important points that Victora et al touched on have also been noted by the WaSt TIG as important lessons and concepts for the design of research related to wasting and stunting. These include:

The importance of screening for those at highest risk of mortality:

The authors highlighted that low mid-upper arm circumference (MUAC) could be used to identify children at risk of death and, furthermore, was a preferred screening tool due to its simplicity of use. Linking this to the conversation on concurrent WaSt, Myatt et al (2018) analysed 51 cross-sectional survey datasets and found that a MUAC <133mm had a sensitivity of detecting concurrent WaSt cases of 81.0% using ROC analysis.³ However, low weight-for-age z-scores (WAZ) had an even better sensitivity and specificity for capturing WaSt cases (as discussed below).

The importance of moving away from a preoccupation with anthropometric cut-offs:

Victora et al guided readers to consider the distribution of height-for-age z-scores (HAZ) and weight-for-height z-scores (WHZ) curves from the surveys and where these fall relative to the World Health Organization (2006) standards. In this paper, the Demographic and Health Surveys (DHS) had HAZ and WHZ distributions that were

Box 1 Evidence-based nutrition interventions recommended by the *Lancet Series*

First Series 2008: There was deemed sufficient evidence for the recommendation of the following interventions: iron folate supplementation, maternal multiple micronutrient supplementation, maternal calcium supplementation, interventions to reduce tobacco consumption or indoor air pollution, the promotion of breastfeeding (individual and group counselling), behaviour change communication for improved complementary feeding, zinc supplementation, zinc in the management of diarrhoea, vitamin A fortification or supplementation, universal salt iodisation, handwashing or hygiene interventions and the treatment of severe acute malnutrition.

Second Series 2013: Ten effective interventions were outlined: 1) periconceptual folic acid supplementation or fortification, 2) maternal calcium supplementation, 3) maternal balanced energy protein supplementation, 4) maternal multiple micronutrient or iron-folic acid supplementation, 5) vitamin A supplementation, 6) the promotion of breastfeeding, 7) complementary feeding education and food provision (food insecure); complementary feeding education (food secure), 8) preventive zinc supplementation, 9) the management of moderate acute malnutrition and the treatment of severe acute malnutrition, 10) zinc for the management of diarrhoea.

Third Series 2021: Eleven effective interventions were summarised: 1) large-scale food fortification for the prevention of micronutrient deficiencies, 2) maternal calcium supplementation in low intake populations, 3) maternal balanced energy protein supplementation in undernourished populations, 4) maternal multiple micronutrient supplementation, 5) vitamin A supplementation in deficient contexts, 6) breastfeeding promotion and counselling, 7) complementary feeding education and food provision (food insecure); complementary feeding education (food secure), 8) preventive zinc supplementation, 9) ready-to-use foods for the management of acute malnutrition, 10) therapeutic zinc supplementation for diarrhoea, 11) preventive small quantity lipid nutrient supplementation for optimising health and growth in children.

both shifted to the left of the growth standard curves. Two important reflections on this include:

1. Populations represented by the DHS surveys not only had an increased proportion of stunted and wasted children compared to well-nourished populations, with their growth curves shifted to the left, the whole population had a lower WHZ or HAZ than if they had been well-nourished.
2. This reinforces the focus on the process of wasting and stunting and how many children grow below their potential. It is not only where a child ends up (whether that child becomes stunted or wasted) that is important. It also means under standing that a child may have started with a healthy WHZ of +2 but then lost weight to WHZ -1.5 which would still not be classified as being wasted but would potentially still have implications on later linear growth.

Common drivers of wasting and stunting:

The article underscores that wasting and stunting already manifest at birth and that therefore the in utero period is important to consider for the prevention of both processes. This messaging was also highlighted in previous *Lancet Series* where the determinants of stunting and wasting were looked at and common pathways for prevention included maternal nutrition, postnatal diet, disease management and nurturing care. Members of the WaSt TIG have recently released a briefing note on the prevention of child wasting which explores these themes further.⁴

Conclusions

It was encouraging to see the prominence accorded to the links between wasting and stunting in the 2021 *Lancet Series*. Within an article that sought to capture so many themes, concurrent WaSt and the associations between wasting and stunting were given a lot of attention in both the summary and its own standalone section. Additional key messages not captured but important to consider are:

1. Boys tend to be at greater risk of concurrent WaSt than girls (Khara et al, 2018; Schoenbuchner et al, 2019; Myatt et al, 2018).
2. Low WAZ captures almost all concurrent WaSt cases and it therefore represents a simple screening tool for identifying those at higher risk of mortality.⁵ Myatt et al (2018) found that a WAZ <-2.8 had a 98.5% sensitivity and 91.1% specificity of identifying children with concurrent WaSt using ROC analysis. Using WAZ as a screening tool to identify children at highest risk is potentially simple to implement and scale up as growth monitoring programmes already monitor WAZ.

³ In this context 'sensitivity' refers to the proportion of children with concurrent WaSt that a MUAC <133mm was correctly able to identify. ROC analysis refers to 'receiver operating characteristic' analysis that graphically represents sensitivity i.e., how well a certain diagnostic tool (e.g., low MUAC) correctly identifies the condition in question (e.g., concurrent WaSt) versus the ability to correctly exclude those without the condition (known as specificity).

⁴ This brief can be found here: <https://www.enonline.net/attachments/4034/WaSt-Prevention-Brief.pdf>

⁵ However, it needs to be acknowledged that in some contexts collecting accurate age data can be challenging.

3. Thirdly, episodes of stunting also predict later wasting (Schoenbuchner et al, 2019) although the strength of association is not as strong as wasting predicting later stunting and the mechanisms are less clear. However, this observation still supports the consideration of both wasting and stunting prevention together in policy and practice.

With the publication of this *Lancet* Series, together with the rapidly expanding body of work arising from the WaSt TIG, we have a good foundation to maintain the focus on how concurrent WaSt is a marker of increased vulnerability to mortality, how wasting and stunting are interlinked and what should be done at the programmatic and policy levels to address these considerations.

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Research Summary

Exploring the relationships between wasting and stunting among a cohort of children under two years of age in Niger

This is a summary of the following paper:

Kohlmann K, Sudfeld C, Garba S, Guindo O, Grais R and Isanaka S (2021) Exploring the relationships between wasting and stunting among a cohort of children under two years of age in Niger. *BMC Public Health* 21, 1713.

<https://doi.org/10.1186/s12889-021-11689-6>

Childhood wasting and stunting continue to present a large public health burden globally with approximately 7% of children under-five years being wasted and 22% stunted in 2020. Wasting and stunting can co-exist within the same child (concurrent WaSt) and these two forms of undernutrition may share common risk factors. Despite the growing evidence highlighting the relationship between wasting and stunting and the increased risk of mortality for children with concurrent WaSt, the two forms of undernutrition continue to be treated separately in much research, programming and policymaking.

In this paper, the authors analysed data from a longitudinal birth cohort in Niger to explore the risk factors for wasting and stunting while also assessing the relationship between wasting and stunting over time. The study location was a rural area of south-central Niger with data coming from an existing vaccine trial. In total, 6,567

infants had growth monitoring every four weeks from early infancy until two years and birthweight was recorded.

The authors found the lowest prevalence of wasting in the cohort was in the first six months of life (5-10%) increasing to 14-16% from 9-18 months of age. Peak prevalence of concurrent WaSt (12.5%) was at 15 months, mirroring wasting prevalence trends. At 24 months of age, 14% of children were wasted, 80% were stunted and 12% had concurrent WaSt. Compared to normal birthweight infants, low birthweight infants had a higher prevalence of stunting throughout the study duration and they also experienced a higher prevalence of wasting and concurrent WaSt from 10 months of age onwards.

The risk factors common to wasting and stunting at six and 24 months of age included maternal short stature, male sex and low birthweight. Common protective factors included higher maternal body mass index and household wealth. Being wasted at age six and 24 months was predicted by earlier episodes of

wasting, stunting and concurrent WaSt (between two to 21 months). Being stunted at age six and 24 months was similarly predicted by early experiences of stunting and concurrent WaSt but was only predicted by prior wasting episodes after six months of age.

Together, this data adds to the growing literature describing the bi-directional relationships between wasting and stunting over time. The findings further illustrate the importance of integrated programming to address both forms of undernutrition together. Of particular importance is the heightened risk of wasting, stunting and concurrent WaSt for those born low birthweight. To address this, the authors suggest an emphasis on pre-pregnancy and pregnancy interventions as well as a continued focus on women's nutrition across the life cycle to reduce the risk of maternal short stature and the subsequent risk of low birthweight.

Scaling up child wasting prevention and treatment in the context of stunting prevention in Indonesia

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Mother and child, beneficiaries of cash assistance from UNICEF in Indonesia

Leveraging efforts for joint wasting and stunting programming in Indonesia

This article outlines how wasting treatment was integrated into stunting prevention programmes in Indonesia

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INDONESIA

Key messages:

- Indonesia has one of the highest burdens of wasting and stunting in children globally. This has immediate consequences on children's ability to survive, develop and grow and severe long-term implications for human capital development.
- The Government of Indonesia successfully leveraged political momentum to accelerate child stunting reduction to simultaneously tackle child wasting by scaling up an essential package of nutrition-specific and nutrition-sensitive interventions, strengthening the national and subnational capacity to deliver essential nutrition services and enhancing the multi-sector nutrition response.
- As a result of this commitment, the integrated management of acute malnutrition programme to prevent and treat children with severe wasting was scaled up nationwide across all 514 districts in 34 provinces and the coverage of nutrition services and budgets increased.

Background

Despite tremendous progress in reducing malnutrition in Indonesia, the challenge of undernutrition in children under five years of age remains. Stark differences are noted between provinces with the prevalence of stunting ranging from 42.6% in East Nusa Tenggara (NTT) (provinces shown in Figure 1) to 17.6% in Jakarta, and that of wasting from 14.4% in West Nusa Tenggara (NTB) to 4.6% in North Kalimantan (National Basic Health Research, 2018)¹. However, a recent annual study by the Government of Indonesia (SSGI) showed that stunting and wasting prevalence reduced to 24% and 7% respectively!

Sources of information for the facts summarised in this article come from a range of sources, including key informant interviews, summarised in Box 1.

Government policies and strategies

The Government of Indonesia (GoI) has

committed to tackling stunting and wasting simultaneously, as outlined in the 2017 National Strategy to Accelerate Stunting Prevention which includes plans to scale up child wasting prevention and treatment. Subsequently, indicators and annual targets for both forms of undernutrition have been developed and are included in the National Medium-Term Development Plan 2020–2024 with ambitious targets to reduce the prevalence of stunting to 14% and wasting to 7% by 2024. Reflecting on these targets, the Ministry of Health (MoH) set a goal of at least 60% of primary health-care centres providing integrated management of acute malnutrition (IMAM) services by 2024. Additionally, a Presidential decree (no. 72) on stunting reduction acceleration was launched in 2021 and included a target to provide treatment to 90% of severely wasted children by 2024. Furthermore, in 2021, the GoI developed its country-level Global Action Plan (GAP)

¹ The RISKESDAS conducted every five years

on Child Wasting Roadmap with support from UNICEF and other United Nations (UN) partners.

The National Stunting Prevention programme

The 2017 national strategy to accelerate stunting prevention established a nationwide programme to ensure that this would be incorporated into existing policy and institutional frameworks. Following the launch of the programme, the Gol solidified its commitment to scaling up action against stunting by leveraging multiple funding sources to support the programme at all levels. Between 2018 and 2020, more than USD7.5 billion was allocated to support the scale-up of nutrition-specific and nutrition-sensitive interventions at the national level and an additional USD596 million was used to support the acceleration of stunting prevention at the sub-national level. Furthermore, the Gol channelled approximately USD307 million to villages to support evidence-based nutrition actions (Secretariat of the Vice President of Indonesia, 2021).

The stunting reduction programme is multi-sector in nature involving stakeholders across sectors at both national and sub-national levels with different coordination structures and focus for each. The programme targets interventions within the first 1,000 days of life including pregnant and lactating women and adolescent girls.

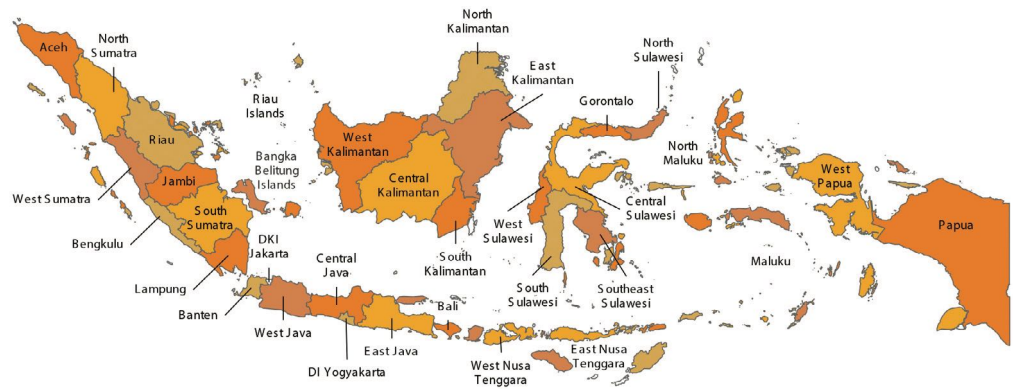
At the national level, 19 ministries and institutions coordinate the programme together with other relevant stakeholders such as civil society, development partners, academics, the private sector and the media. Efforts are focused on delivering a set of evidence-based nutrition-specific and nutrition-sensitive interventions with high coverage and quality. At the sub-national level, intensive efforts are being made to support programme convergence through strengthening multi-sector coordination and the capacity of local government authorities, healthcare and non-health workers and frontline workers. Box 2 provides a case study from East Nusa Tenggara province.

Addressing child wasting in the context of the stunting reduction programme

A set of evidence-based nutrition-specific and nutrition-sensitive interventions was selected to be scaled up across the country to support the national stunting prevention programme. Specifically, the prevention and treatment of moderate and severe child wasting were included as two of the eight critical nutrition-specific interventions prioritised. The nutrition-sensitive interventions included various areas such as home food gardening and improvements in water and sanitation services.

Accordingly, the IMAM programme was scaled up across all 514 districts in 34 provinces. To facilitate the scale-up, the MoH, with support from UNICEF, developed and disseminated national

Figure 1 Map of Indonesia



Source: World Health Organization. (2017). State of health inequality: Indonesia. World Health Organization. <https://apps.who.int/iris/handle/10665/259685>

IMAM guidelines and an accompanying training curriculum (adapted in light of the COVID-19 pandemic). IMAM services were also institutionalised including community screening in all provinces and integrating screening and treatment data into the national health and nutrition information system.

Furthermore, since 2019, the Gol and UNICEF have been working to support the local production of ready-to-use therapeutic food (RUTF) in collaboration with the Scaling Up Nutrition (SUN) Business Network. The first-ever acceptability and efficacy study of local RUTF recipes was conducted through this partnership and completed in December 2021. The results will guide government efforts to ensure the availability of local RUTF to treat severely wasted children and thus to support the scale-up efforts.

Successes, challenges, and lessons learned

Successes

At the national level, there have been deliberate efforts to strengthen the joint implementation of child stunting and wasting programmes. There is currently an enabling environment for

integration through the changes at policy level as exemplified in the recent Presidential decree and the substantial increase in budget allocations for nutrition interventions. There is substantial support from national level to sub-national authorities in designing interventions for stunting reduction that also include the management of wasting. This has been further supported by the institutionalisation of IMAM services into the existing health system and improvements to national nutrition data management systems.

Furthermore, in 2021 UNICEF and other UN agencies in Indonesia have supported the Gol to develop and endorse the GAP on Child Wasting and a relevant operational roadmap. The GAP Roadmap will guide the Gol and UN agencies to take a focused, cohesive, coordinated approach to effectively address child wasting. Importantly, given the strong inter-linkage between child wasting and stunting, the Roadmap is also expected to contribute to the reduction of child stunting in Indonesia.

At the sub-national level, particularly in NTT province, major successes include the increased capacity of sub-national government authorities

BOX 1 Sources of information for key facts and figures in this article

- Ali, P. B. (2020). Ph.D. presentation: Stunting Prevention Acceleration Programme Evaluation Implementation and Achievement (presented 24 November 2020). IPB University, Indonesia.
- Summary of Ministry/Agency Output (RO) for 2021. Support to the acceleration of stunting reduction. January 2021
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- Presidential decree no. 72 on stunting reduction acceleration (2021).
- Interviews were undertaken with the following: Head of Governance and Human Development section (Pemerintahan dan Pembangunan Manusia/ PPM), PHO NTT Province; Maternal and Child Health Advisor, Momentum; Head of Manulai I Village; Head of East Penfui Village; Lead of PKK (Pemberdayaan and Kesejahteraan Keluarga) community organization; Head of Provincial Stunting Task Force (Working Group); Director of Health and Community Nutrition, Bappenas; Director of Community Nutrition, Ministry of Health.

to implement and monitor the national stunting reduction acceleration programme and the adaptations made for their local context (such as including five additional indicators that were key causal factors for stunting in this context into the broader national monitoring system). There have been increased commitments from other government institutions and community health systems, such as a women's empowerment organisation, in supporting stunting and wasting interventions. The village government's capacity has been strengthened to play a leading role in prevention activities at the village level. Local authorities develop activity plans based on the identified causes of stunting and wasting in their specific villages.

Furthermore, advocacy efforts led to the Government substantially increasing the budget allocations for stunting and wasting treatment and prevention. Between 2017 and 2020, the budget increased from approximately USD979 million to USD2.8 billion. As of 2021, 19 government ministries and institutions had committed a total budget allocation of approximately USD2.5 billion for nutrition-sensitive and nutrition-specific interventions and coordination. Looking forward, sustained advocacy efforts are needed to ensure further budget increases for child wasting prevention and treatment, particularly during the COVID-19 pandemic recovery phase.

Challenges

Despite the progress made to date, challenges remain. Scaling up IMAM in a highly decentralised and culturally diverse country and ensuring that authorities at multiple sub-national levels of government can address both stunting and wasting concurrently remains a key challenge. Data management issues also persist, particularly ensuring sufficient resources to enable quality data management. Health facilities should also be strengthened to fully integrate IMAM services including community mobilisation, local RUTF availability and monitoring and evaluation. Substantial gaps also remain in integrating and up-scaling nutrition-sensitive interventions including home food production, water and sanitation and social protection. These have been exacerbated by nutrition service disruptions and a reduction in wasting programmes budgets due to the COVID-19 pandemic. There is also a need for more stakeholders to become involved in implementing child wasting services.

Conclusion

Indonesia shows a successful example of how child wasting and stunting can be addressed simultaneously through large-scale programmes that deliver essential nutrition actions including:

- Continued advocacy for sustained political commitment to and awareness of addressing child stunting and wasting simultaneously at all levels.
- Strengthening IMAM services at community and health system level for the early detection, referral and treatment of children with wasting.

Box 2 Scaling up lifesaving integrated management of acute malnutrition (IMAM) within the stunting reduction programme in East Nusa Tenggara (NTT) province

Background

Stunting and wasting are persistent problems in NTT province. According to the National Basic Health Research (Riskesmas) survey data, as of 2018, the province had the highest stunting prevalence in the country (42.6%) and one of the highest levels of wasting prevalence (12.8%).

How was the programme implemented?

The provincial technical team leads the implementation of interventions prioritised in the different national policies and oversees the budget allocations for stunting and wasting interventions. The Stunting Task Force (led by a representative from a non-governmental institution) works under the provincial technical team to support the implementation of the interventions at a more local level.

Between 2018 and 2021, key IMAM activities were scaled up including IMAM training for healthcare workers, ready-to-use therapeutic food (RUTF) procurement, the expansion of the IMAM programme to 21 districts and one municipality and the procurement of mid-upper arm circumference (MUAC) tapes. This shows the integrated approach in the performance of the stunting reduction programme that covers both nutrition-specific interventions (that includes treatment of child wasting) and nutrition-sensitive interventions.

As an example of implementation at the village level, in Manulai 1 the sub-village team meets annually to discuss priority activities and budgets. At this meeting, village stakeholders such as village authorities, community health volunteers and women's empowerment organisations conduct mapping activities and develop joint work plans and budgets based on the village situation analysis. Some community activities implemented by the cadres in the village include supplementary feeding for children under five years of age and pregnant and lactating women, home visits for nutritionally vulnerable households and growth monitoring follow-up appointments as well as recording and reporting back to village heads.

By the end of 2020, IMAM services had been scaled up in all 22 districts of NTT. The screening protocol for severe wasting was introduced in local posyandu (integrated health posts) and puskesmas (public health centres) and family-based MUAC screening was introduced in several districts. A women's empowerment organisation in NTT has supported IMAM service implementation in its 22 model villages across all 22 districts since 2020, allocating budget for capacity building, monitoring and supervision as well as the procurement of RUTF and MUAC tapes. The Stunting Task Force at provincial level developed the Field Operational Guideline that has been used since 2020 to train village authorities and support them in planning, implementing and monitoring stunting interventions at the village level. These stunting interventions include the treatment of child wasting. Government leaders from all sub-national levels have generally committed to continually implement nutrition actions to prevent and manage child stunting that also address child wasting.

- Prioritising local production of RUTF to improve the supply and affordability of nutrition commodities.
- Strengthening the coordination of nutrition-specific and nutrition-sensitive interventions (and inter-sectoral collaboration) related to the prevention of wasting and stunting.
- Improving the data management capacity of sub-national teams so that there is quality data to track progress and inform decisions.

The national strategy to accelerate stunting prevention and the presidential decree on the acceleration of stunting reduction outlines the interventions that can be undertaken to prevent stunting, for example, non-cash food assistance, behaviour change communications campaigns, household food security interventions and early childhood education programmes that incorporate nutrition information. However, further ef-

forts are needed to scale up those stunting prevention measures that also directly contribute to preventing child wasting within communities. This may include empowering the relevant government ministries to actively address nutrition improvement as a key objective in their respective sectors in collaboration with the health sector.

For more information, please contact Blandina Rosalina Bait at bbait@unicef.org

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- Secretariat of the Vice President of Indonesia. (2021). Report on the implementation of the 2018-2020 national strategy to accelerate stunting prevention. Jakarta: Ministry of Health.
- Other information sources used to inform the article are listed in Box 1.

USAID's investment in the WaSt TIG



Erin Boyd is a Nutrition Advisor at the United States Agency of International Development's Bureau for Humanitarian Assistance.

Why has the United States Agency of International Development (USAID) invested in wasting-stunting (WaSt)?

USAID's multi-sectoral nutrition strategy (USAID, 2014) was finalised in 2014 and serves to guide USAID on investing in interventions to address malnutrition. The strategy includes goals in line with the World Health Assembly targets for reducing stunting and wasting but the focus on wasting has remained primarily in humanitarian settings. Through monitoring trips and working with data from wasting programming, several USAID nutrition advisors noted that there were many humanitarian contexts where both stunting and wasting were a problem. Since humanitarian resources are expected to be directed toward mortality reduction, wasting treatment was the focus for humanitarian nutrition interventions. Similarly, it was recognised that in settings with a high stunting burden, many of the activities to reduce or prevent stunting may also prevent wasting. However, little was understood about how these two forms of undernutrition manifested in populations or at an individual level and how the two forms of undernutrition might be related. There was also limited data to determine whether stunting and wasting had similar causes.

USAID sought to understand the literature on how wasting and stunting were related and how they differed through an analysis produced in 2015/16 (Khara et al, 2017) which was the first analysis that the WaSt Technical Interest Group (WaSt TIG) published using existing data. Following this work, we wanted to determine whether the same children were affected by both forms of undernutrition, quantify mortality risk and define the extent to which children had both forms of undernutrition. A grant was awarded to ENN to analyse the available data (Myatt et al, 2018) to examine the extent to which concurrent wasting and stunting existed.

USAID has invested in Standardised Monitoring and Assessment of Relief and Transitions (SMART) nutrition surveys for over 15 years and while weight-for-height and height-for-age data on the same children is available, the prevalence of each form of undernutrition was reported at an aggregate level, presenting a missed opportunity to look at the degree of overlap in the

forms of undernutrition within individual children. We were able to access data from SMART surveys, Multiple Indicator Cluster Surveys and Demographic and Health Surveys to perform this analysis (Myatt et al, 2018). Additionally, prevalence estimates are only a snapshot at one point in time and do not capture whether the same child may experience stunting or wasting at different times. The ENN analysis highlighted the need to also look at mortality risk and to do that, cohort data was critical.

Analysing the manifestation of both stunting and wasting in the same child helps us to understand the implications and better target USAID resources as well as to advocate for more programming to address wasting in non-humanitarian settings.

How has WaSt work to date influenced USAID's approach?

To date, the WaSt work has influenced the USAID Nutrition Technical Working Group (NTWG) to examine geographic areas where overlapping wasting and stunting might require additional resource commitment. The Bureau for Global Health and the Bureau for Humanitarian Assistance jointly supported ENN to develop a study protocol (ENN, 2019) to test whether weight-for-age is a possible diagnostic criterion for entry into wasting treatment programmes. Weight-for-age is measured through growth monitoring and promotion programmes and might be a useful platform particularly in non-emergency or longer-term protracted emergency settings. Revisiting weight-for-age provides an opportunity to better link growth monitoring and promotion and other nutrition interventions toward a common goal of optimal growth.

Within USAID, there is an overall recognition that manifestations of malnutrition can co-exist in the same children and limiting programmes to focusing on one form can also limit their impact. The analysis completed by ENN, through the WaSt TIG, suggests that wasting can have a detrimental effect on linear growth. The work of the WaSt TIG has contributed to the overall framing of how USAID can better define and support the prevention of undernutrition.

In addition to webinars on the WaSt work for the NTWG, USAID has three bureaus focusing on nutrition: 1) The Bureau of Global Health, 2)

The Bureau for Resilience and Food Security and 3) The Bureau for Humanitarian Assistance. USAID has also created an internal Wasting Technical Working Group which seeks to better support wasting programming in non-emergency countries. Having access to data related to both wasting and stunting provides an opportunity for all three bureaus to work together to identify ways that USAID programming can mitigate all forms of malnutrition.

Opportunities for WaSt at USAID

USAID greatly values the use of data for decision making. The WaSt story is a clear example of using available data to look at problems through a different lens. It is worth re-emphasising that the data used for all WaSt analyses were retrospective analyses re-analysed at an individual level to look at different research questions. The sharing of raw data between academic institutions and independent researchers is not unprecedented but should be more common to facilitate additional, needed analyses. USAID appreciates the role that ENN and the WaSt TIG members were able to play in accessing the raw data, particularly considering some data was from the 1970s.

USAID continues to face a challenge in knowing which activities for the prevention of undernutrition are most effective in different contexts. As we begin to better understand the links between stunting and wasting, this will help us to better design programmes that can address all forms of undernutrition. The dichotomy of stunting and wasting has resulted in some missed opportunities to understand and support optimal child growth and the work of the WaSt TIG is helping to highlight some key areas where programming can be more inclusive and holistic.

For more information, please contact Erin Boyd at eboyd@usaid.gov

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Nutrition Impact and Positive Practices in Sudan

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Mother and child participating in community activities in Sudan



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This article is based on an independent evaluation commissioned by GOAL and led by Action Against Hunger UK's Monitoring, Evaluation and Learning Services, through support from the U.S. Agency for International Development (USAID). We acknowledge the contribution of Joel Woolfenden, a member of the Action Against Hunger evaluation team, in an early version of this paper. Since its inception, NIPP has been funded in Sudan, South Sudan, Niger, Malawi, Zimbabwe and Uganda by Irish Aid, the UK Foreign, Commonwealth and Development Office, ECHO, the Office of Foreign Disaster Assistance, USAID, the Sudan Humanitarian Fund managed by the United Nations Office for Coordination of Humanitarian Affairs, UNICEF, the United Nations High Commissioner for Refugees, the Garden Trust and the Waterloo Foundation.

Background

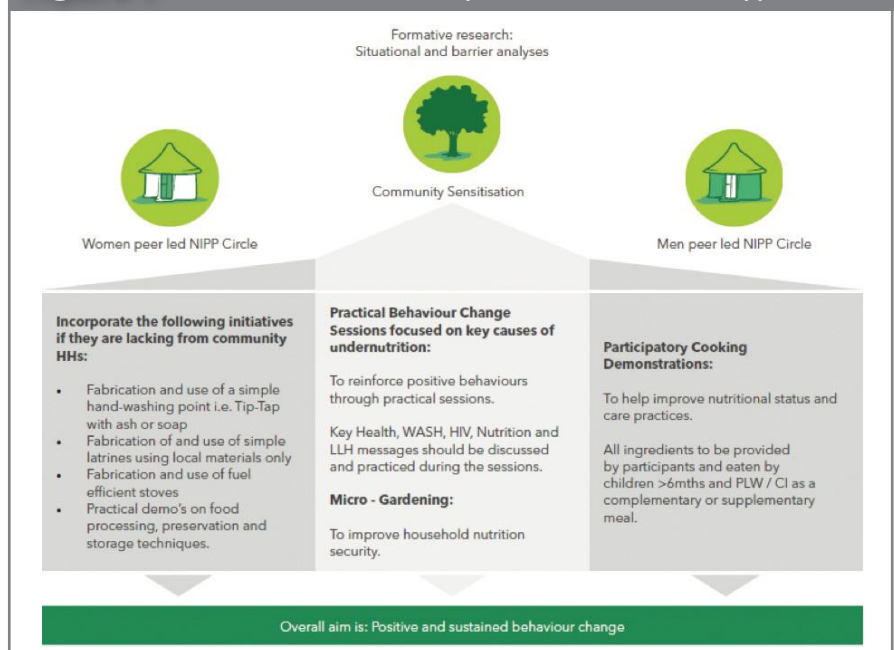
Despite some progress, maternal and child malnutrition remains a global health concern, worsened by the COVID-19 pandemic. In Sudan, 37% of children under five years of age suffered from stunting and 17% from wasting in 2019 (UNICEF, 2019). In addition, according to UNICEF and the World Health Organization thresholds (de Onis, 2018), 14 out of 18 (82%) states in Sudan had a very high prevalence of stunting ($\geq 30\%$) and 11 out of 18 (61%) a very high prevalence of wasting ($\geq 15\%$). The burden of malnutrition is partly driven by inadequate maternal, infant and young child feeding (M-IYCF)

practices and inappropriate hygiene, sanitation and health seeking behaviours (UNICEF, 2019). This situation is exacerbated by the protracted humanitarian crisis in conjunction with El Niño-associated food insecurity and malnutrition. Tackling malnutrition is one of the core challenges of the 21st century (Development Initiatives, 2018) and involves addressing many complex and inter-related determinants.

The Nutrition Impact and Positive Practice approach

GOAL in Sudan (GS) has been implementing health and nutrition programming in Kutum lo-

Figure 1 Overview of the Nutrition Impact and Positive Practice approach



Definition of abbreviations in diagram: LLH refers to Livelihoods; CI refers to Chronically Ill

cality, North Darfur state since 2004 in response to the humanitarian crisis. GOAL's approach encompasses health system strengthening to support the provision of integrated therapeutic nutrition services and M-ICYF alongside a preventive component through the Nutrition Impact and Positive Practice (NIPP) approach.

The NIPP approach was designed by GOAL in 2012 as a gender sensitive, multi-sector, grassroots programme to address the behavioural determinants of malnutrition. The approach involves a 12-week series of meetings during which community leaders and separate groups of male and female caregivers participate in practical behaviour change sessions to tackle the issues contributing to malnutrition in their community. Participation in the programme is voluntary and the meetings are conducted by trained female and male volunteers from the community (see Figure 1). The adoption of positive behaviours is promoted and reinforced through repetitive, participatory activities that are designed to identify and address the barriers to, and the drivers of, behaviour change. Selected behaviours are based on their feasibility, as well as on local availability and access to materials, and include cooking demonstrations, micro-gardening, building replicable latrines, hand-washing points, rubbish pits, utensil drying racks and fuel-efficient stoves as well as learning active health-seeking behaviours and food processing, preservation and storage techniques.

The implementation of the approach is guided by the NIPP implementation guidelines (GOAL, 2016) and toolkit which support planning, implementation, monitoring and communication. The NIPP toolkit includes separate implementation frameworks for female and male groups. For females, the framework involves the assessment of caregivers and children at enrolment (baseline), the monitoring of attendance at meetings and measuring mid-upper-arm-circumference (MUAC) across the 12-week series of meetings. Upon graduation, the initial assessment is repeated and the participants are classified as successful, defaulted, non-response or referred. To assess maintenance of knowledge and practices, a randomly selected sub-sample of graduated children and pregnant and lactating women (PLW) (N=82 per intervention area) are followed up at two months, six months and 12 months post-graduation.

GS has reached over 8,561 caregivers with NIPP and approximately 42,805 household members directly benefitted from the programme between 2013 and 2019. This article presents the findings from an independent evaluation conducted by Action Against Hunger UK's Monitoring, Evaluation and Learning Services (AAH-MS) in 2019 to (1) evaluate the effect of NIPP on moderate acute malnutrition (MAM) prevention and treatment in children 6-59 months of age; and (2) perform a cost-efficiency analysis.

Methods

This evaluation used a mixed-methods design, including both quantitative and qualitative as-

sessments, and a cost analysis. NIPP's longitudinal monitoring collects over 20 indicators on knowledge, behaviours and anthropometry from all participants at baseline and graduation and from a representative sample at three time points up to 12-months post-graduation. GS's database containing 5,017 data points was used for the quantitative analysis. The data was categorised into the following areas: care practices, feeding practices, micro-gardening and livelihood practices plus hygiene and sanitation practices. A group of variables was selected for each practice area and built into regression models to estimate NIPP's effect on MAM treatment and to identify the behavioural predictors of improved nutrition status from baseline to graduation.

The same categorisation of practice areas and variables was used to analyse MAM prevention. This analysis assessed the degree to which the NIPP approach has a long-lasting impact on behaviour change and MAM status. Due to data limitations, descriptive analysis rather than regression models was used to analyse post-graduation follow-up data. Finally, the cost analysis used expenses data for three NIPP programme periods between May 2016 and May 2019, along with the number of NIPP groups and participants, to identify the expenses related to running the programme as well as the average cost to treat MAM.

Results

Of the 5,017 data points analysed in this evaluation, 3,808 represented children 0-59 months. Of these 3,808 children, 1,807 (47.5%) were male and 1,999 (52.5%) were female.

MAM prevalence decreased from 87% at baseline to 4% at graduation in children 6-59 months of age, corresponding to a 95% cure rate (N=3,385) (see Figure 2). Of the 167 children

for whom data was collected from graduation to 12-month post-graduation, 93% experienced improved MUAC measurements (N=155) while 6% deteriorated. None were classified as malnourished during this period.

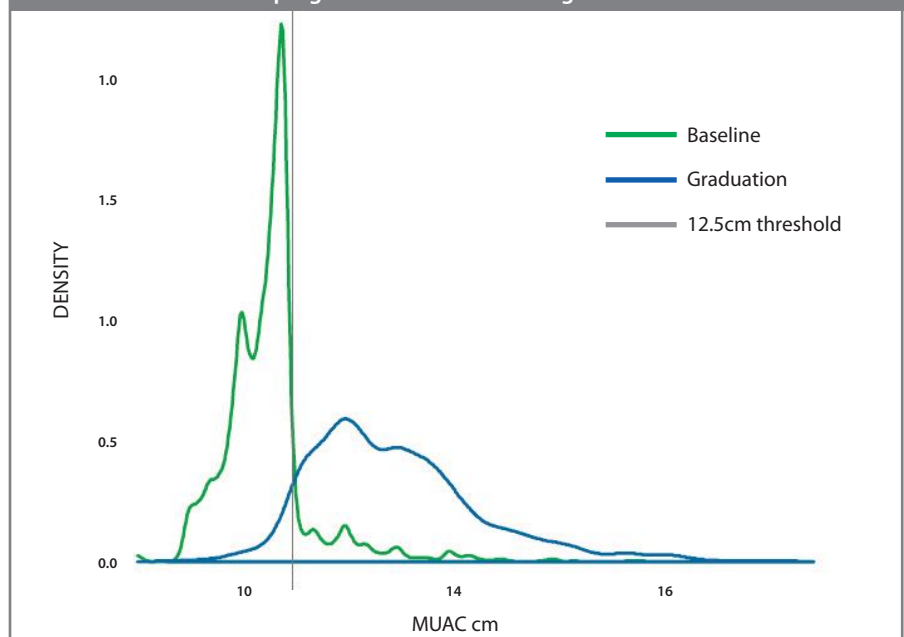
The majority of the 19 knowledge and behaviour indicators analysed improved during the 12-week cycle and were either sustained or improved at 12-months post-graduation. The most noteworthy decline in positive practices at 12 months was related to micro-gardening and this was confirmed by the qualitative analysis. For most of the indicators, an improvement from baseline to graduation was associated with an improvement in child MUAC except for two behaviours: having a latrine (non-significant) and having a micro-garden (significant). The direct expenses required to cure a child from MAM through NIPP in Sudan was estimated at €42.90.

Limitations

Of the 5,017 cases in the Sudan dataset, 445 children and PLW were sampled and followed up from graduation to two-months post-graduation. Only 201 of these cases were followed up to 12-months. This loss-to-follow-up between graduation and 12 months may have biased the post-graduation analysis. A retrospective qualitative assessment conducted by GOAL in 2015 in Malawi and Zimbabwe showed that migration for work or economic reasons was the main reason for loss-to-follow-up after NIPP graduation (unpublished). While GOAL has included migration as an exclusion criterion for enrolment to minimise attrition during the 12-week NIPP cycle, they have limited control over loss-to-follow-up after graduation.

The cost-efficiency analysis was limited to project expense data and did not include an analysis

Figure 2 Distribution of mid-upper arm circumference for children under five years of age enrolled in the Nutrition Impact and Positive Practice programme at baseline and graduation



of support or societal costs which would contribute to the total cost of programme implementation. Some societal costs, i.e., financial costs incurred by the caregivers in relation to micro-garden and latrine constructions, were mentioned by participants in the qualitative assessment. However, a full cost-effectiveness analysis is needed to fully understand the societal costs and how these affect uptake and maintenance of behaviours.

Lessons learned

NIPP was designed to holistically address the underlying behavioural drivers of malnutrition in children and mothers through multi-sector, gender-sensitive actions. However, during its early iterations, the approach focused on sector-specific technical support for individual activities. For example, livelihood specialists supported on micro-gardening, WASH specialists on handwashing, latrines and other hygiene-promoting elements, health specialists on active health-seeking behaviours and nutrition specialists on M-ICYP, care and cooking demonstrations. This fragmented approach failed to engage families in daily activities across sectors and was restricted by the need for collaboration between different sectoral leads. NIPP has since been redesigned (between 2015 and 2017) as a more integrated and inclusive approach which pulls together the multi-sector, behavioural determinants of malnutrition where the use of peer-led support, practice and repetition enables participants to simultaneously improve multiple behaviours within their daily routines. Internal and external evaluations such as this have informed this process.

The positive effects of the NIPP approach may be linked to its foundation in a theory of change (ToC) model (Harris-Fry et al, 2020). The NIPP ToC is built around three impact pathways including (1) cross-sector and practical behaviour change sessions designed to improve child feeding and care practices by increasing female and male caregivers' knowledge and skills around M-ICYP, hygiene-sanitation and health-seeking behaviours as well as by triggering households' construction and use of hygiene-enabling facilities; (2) participatory cooking demonstrations using locally available and accessible foods to make high-energy, nutrient dense recipes; and (3) micro-gardening and food processing, preservation and storage techniques designed to improve household year-round access to and consumption of diversified and nutritious foods. These impact pathways all contribute to an improved health and nutrition status.

It should be noted that although NIPP has the potential to address different manifestations of malnutrition (wasting, stunting or micronutrient deficiencies), anthropometric outcomes focus on wasting measured by MUAC in conjunction with behavioural and health indicators. The reason for this is attributable to (1) the operational simplicity and accuracy of the MUAC tool compared to tools used for taking weight and/or height measurements in community contexts; and (2)

the relatively short timeframe of the NIPP approach where, according to a recent brief (page 94) published by the United States Agency for International Development Advancing Nutrition (USAID, 2020), stunting should be used as an indicator of the overall wellbeing of a population rather than as a primary indicator of the success or failure of short-term or single nutrition interventions. This suggests that, even if feasible, linear growth may not be a relevant indicator of effectiveness for a programme such as NIPP.

This evaluation has revealed that NIPP participants in Sudan faced challenges in establishing and/or sustaining their micro-gardens after graduation. Similar findings were reported in Niger and Malawi in 2017 and 2018 respectively. In Sudan, a lack of water, particularly during the dry season, and limited access to seeds and tools were found to limit the uptake and/or maintenance of micro-gardening. While the implementation guidelines for the NIPP approach (GOAL, 2016) considers water access, the labour-intensive agricultural season and contextually appropriate agricultural practices, they have not explicitly considered the dry season or the size of micro-gardens. The evaluation has also put an emphasis on incorporating climate-resilient agricultural techniques and sustained access to climate-resilient seeds or nutritionally improved seeds to ensure the sustainability of micro-gardens. In Sudan, these factors have been addressed in the NIPP micro-gardening component through the promotion of small-scale micro-gardens, the provision of improved seeds, the inclusion of climate-smart agriculture techniques in the NIPP curriculum and by linking NIPP communities to agro-dealers through community fairs. Despite the challenges faced, it is still deemed an important component for inclusion in communities who produce much of their own food.

As mentioned, attrition during the post-graduation follow-up has restricted analyses at this time point. GOAL therefore collaborated with an independent biostatistician in the last quarter of 2021 to revise the NIPP sampling framework. The updated framework incorporates a larger sample size for follow-up, but with a reduced timeframe, whereby longitudinal data will only be collected until six-months post-graduation. Having a larger, representative sample will allow for more complex analyses that will contribute to the further development of MAM prevention programmes.

Conclusion and next steps

Findings from the AAH-MS evaluation of NIPP in Sudan are similar to the findings from the analysis of GOAL's global NIPP dataset including data for 12,570 children collected over five years of implementation across five sub-Saharan countries (unpublished analysis). These findings highlight the contribution of NIPP to reducing MAM in children under five years of age as well as to improved nutrition, hygiene and health-seeking behaviours. The direct cost per child for MAM treatment through NIPP in Sudan was estimated at

€42.90 (~\$48.07). A 2019 study conducted in Mali reported average costs of \$89.01 and \$90.43 per child for MAM treatment using ready-to-use supplementary food or corn-soy blend++ respectively (Isanaka, 2019). Although these costs are not directly comparable due to contextual differences and the absence of standardised methods for cost analysis, this highlights the potential cost-efficiency of community-based interventions for undernutrition like NIPP. Sustainability and the duration of impact are also key considerations when comparing interventions since the impact of food-based, input driven interventions such as those evaluated in Mali is often limited to the implementation period, unlike NIPP.

It is important that donors, practitioners and governments acknowledge the need for long-term funding to progress research and programming efforts to address undernutrition. The findings from this evaluation contribute to the evidence base on community-based social behaviour change communication strategies for the prevention and treatment of undernutrition and can be used to advocate for increased buy-in and funding for NIPP scale-up in Sudan and beyond. Building on the positive achievements of NIPP, GOAL worked with the Sudan Federal Ministry of Health (FMoH) in 2018 to set up a national NIPP Technical and Advisory Service (NTAS) supporting NIPP scale. NTAS has led NIPP institutionalisation in Sudan with the FMoH formally endorsing the NIPP implementation guidelines in April 2021. Together with this technical hub, GOAL will continue to support NIPP implementation in Sudan while progressing the research agenda on the prevention of malnutrition.

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Promoting linear growth when treating child wasting

This article discusses the state of evidence surrounding the treatment of wasted and stunted children considering current challenges and possible solutions

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A mother feeds her malnourished twin boy with a fortified infant porridge at a health centre, Burkina Faso

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Key messages:

- Evidence suggests that children in wasting treatment are often stunted and they often become even more stunted during treatment and the post-discharge period.
- More research is needed to explore how wasting treatment programmes can better support linear growth and related functional outcomes.
- Current options for exploration include altering the composition and dose of ready-to-use food to contain more growth-promoting amino acids and the provision of better post-discharge support, since linear growth and development takes time to achieve.

Background

Wasted children are more likely to be stunted and vice versa. Wasting and stunting are both markers for, and drivers of, adverse outcomes throughout childhood, negatively impacting cognitive development and increasing the risk of morbidity and mortality due to infectious diseases, as well as of obesity and other metabolic complications in later life (Grey et al, 2021). Wasting treatment currently targets short-term outcomes including survival and weight gain. However, given the interrelated risks associated with wasting and stunting, treatment approaches may have the potential to simultaneously enhance linear growth in addition.

Over the past few decades, successful, multi-sector interventions to prevent stunting have been identified and the prevalence of stunting has reduced globally, albeit slowly (Hossain et al, 2017). Current evidence suggests that effective strategies for stunting reduction focus on preventing (rather than treating or reversing) linear growth retardation during the first 1,000 days of life (Leroy et al, 2020). Well-evidenced preventative interventions include micronutrient supplementation during pregnancy and early childhood, breastfeeding promotion, complementary feeding

education and complementary food supplementation such as regular small-quantity lipid nutrient supplements (Keats et al, 2021).

While stunting prevention should be prioritised, evidence also supports a biological plausibility for reversing stunting at the individual level. For example, adopted children who have experienced positive changes to their living environments have shown accelerated catch-up growth by aged 12 years (Johnson et al, 2018). Unfortunately, studies suggest that providing energy-dense and micronutrient-rich supplemental foods alone does not meaningfully support catch-up in height-for-age and more is needed to help children to achieve their growth potential (Dewey, 2016).

Linear growth during treatment for wasting

Survivors of severe wasting treatment are significantly more stunted than other stunted children in their community in the short- and long-term, regardless of how stunted they were at admission to treatment (Lelijveld et al, 2016). This suggests that children's height-for-age declines while receiving treatment for wasting. The lack of adequate, subsequent catch-up growth

also implies that the effects of wasting linger even after anthropometric 'recovery' is achieved. Alternative approaches to wasting treatment are needed that reduce the risk of stunting during recovery from wasting and, ideally, support catch-up in linear growth and development.

Route forward: Better supplementation?

One possible route forward is more targeted and comprehensive supplementation which specifically influences the biological drivers of growth. Evidence shows that essential amino acids regulate a complex set of molecular pathways involving a central signalling node (mTORC1) and the growth hormone IGF-1. These work together to control growth by promoting tissue building and preventing tissue breakdown (Semba et al, 2016; Valvezan & Manning, 2019). Without key amino acids, mTORC1 cannot be activated (Peterson et al, 2011). Stunted children have lower levels of all essential amino acids and likely require higher levels than many non-stunted children due to the need for catch-up growth. Animal-source foods are the richest sources of essential amino acids but are often lacking in the diets of children from countries with high burdens of stunting (Dror & Allen, 2011).

Greater availability of amino acids is also needed to fight systemic inflammation which often affects wasted and stunted children (Maleta et al, 2021). Targeting the various causes of inflammation in stunted children may also be essential for its reversal. While such avenues provide opportunities for reversing linear growth faltering, it is important to note that catch-up in linear growth does not necessarily reflect recovery in other domains, such as brain development, structure and function (Mackes et al,

2020). However, improved amino acid supplementation and the control of inflammation provide potential hypotheses for how wasting treatment can contribute to the prevention and reversal of stunting, ideally with subsequent functional implications.

Altering the composition and dose of ready-to-use food (RUF) might be important for promoting linear growth during and after wasting treatment. Providing milk-containing RUFs has been consistently associated with improved weight gain but less consistently with gain in length (Potani et al, 2021). The IGF-1 promoting effect of dairy has been proposed as a possible mechanism underlying this finding, while it is also possible the improved amino acid content might play a role through mTORC1. Dosage of RUF may also be important for linear growth, since wasting studies that have explored a reduced dosage regime have seen similar weight gain to the current dosage regime but reduced linear growth velocity (Kangas et al, 2019). In two studies, the rates of weight gain and recovery were similar in the standard dose and reduced dose groups, suggesting that the reduction in linear growth velocity may result from inadequacies in specific nutrients rather than insufficient wasting treatment (Stephenson et al, 2021). Identifying which nutrients are implicated could contribute to a better under-

standing of what causes declines in height-for-age z-scores after wasting recovery.

Route forward: Better post-discharge care?

In addition to maximising the formulation and dosage of RUF, post-discharge care following wasting treatment may mitigate the extent of further stunting. Wasting treatment is usually provided for a relatively short period (maximum 16 weeks) until adequate weight gain is achieved. Adequate weight is a prerequisite for linear growth attainment (Isanaka et al, 2019). Therefore, continuing wasting support beyond adequate weight gain may support linear growth and other longer-term outcomes. We know that current post-discharge care is inadequate with high rates of post-discharge mortality and relapse observed in many settings (Stobaugh et al, 2019; O'Sullivan et al, 2018). We also know that children are not immunologically recovered at discharge from wasting care, even if they have achieved adequate weight gain (Njunge et al, 2020). While the evidence for post-discharge vulnerability in severe wasting survivors is strong, very few studies have explored the impact of post-discharge interventions (Noble et al, 2021). The limited data available suggest that providing antibiotics, prebiotics/synbiotics, and/or psychosocial stimulation post-discharge

may be beneficial for growth, survival and development. Post-discharge food supplementation and cash transfers may also reduce relapse (Mengesha et al, 2016; Grellety et al, 2017). These interventions have the potential to support long-term growth and development in wasting survivors. However, more robust and large-scale trials are needed.

Conclusion

Wasting and stunting have interrelated risk factors and an episode of wasting, even with treatment, can exacerbate stunting in the short-term and fail to support adequate catch-up growth in the longer-term. Current evidence suggests that optimising RUF formulations, especially those with adequate essential amino acids to activate biological growth pathways, optimising RUF dosage, increasing the intake of animal-source foods and better post-discharge support may contribute to optimal linear growth in children who survive wasting. However, this research is in its infancy and further exploration into optimal strategies that simultaneously target wasting and stunting is needed. Better still, more effective prevention strategies for wasting and stunting are needed.

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Survey data exploring the prevalence of concurrent wasting and stunting in Southern Angola

This article features a snapshot of the burden of concurrent wasting and stunting in Angola using prevalence data from survey data in two provinces.

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Information on the prevalence of concurrent wasting and stunting (WaSt) in Angola is very limited. However, there is a growing awareness globally that this condition is common and is of public health significance as children with WaSt have an increased risk of death compared to being either stunted or wasted (Garenne et al, 2018). This article describes the prevalence of WaSt among children aged 6-59 months from two provinces, Cunene and Huila, in southern Angola.

Cunene and Huila provinces have predominantly rural and peri-urban populations that have experienced chronic malnutrition for more than a decade. World Vision Angola (WVA), with support from ECHO, conducted a nutrition survey in these provinces in 2016 to inform on-going emergency nutrition programming. To contribute to the understanding of the prevalence of WaSt in Angola, a secondary analysis of this survey data was conducted. Stunting, wasting and underweight were defined as <-2 SD using World Health Organization (WHO) growth standards, height for age, weight for height and weight for age. WaSt was defined as being concurrently wasted and stunted (height for age and weight for height z-score <-2 SD WHO growth standards).

From a sample of 1,226 children 6-59 months of age, 45.8% (95% CI 43.0-48.6%) were stunted, 6.6% (95% CI 5.3%-8.2%) were wasted and 15.8% were underweight (95% CI 13.8%-18.0%). The prevalence of low mid-upper-arm circumference (MUAC) (<125 mm) was 23.2% (95% CI 20.9%-25.7%). The prevalence of WaSt was 3.1% (95% CI 2.2-4.2%) and the proportion of children with concurrent underweight, wasting and stunting was equal to that of WaSt. There was a higher prevalence of WaSt among males (3.9%) compared to females (2.3%) although not statistically significant. The relationship between WaSt and age was explored by looking at the prevalence of WaSt across two age groups, 6-23 and 24-59 months. WaSt was higher among younger children (4.1%) compared to 2.3% in the older age group; however, this was not statistically significant. Among those children with WaSt, 92.1% also had low MUAC (<125 mm).

In different regions of the world, including Africa, WaSt prevalence is reported to range be-

tween 0% to 8% (Myatt et al 2018). While there is no agreed global threshold determining the public health significance of WaSt, 5% has been quoted as a level of concern given the high mortality risk associated with this condition. While the prevalence of WaSt found in this analysis was below this threshold, it is evident that WaSt is of concern in Angola.

The Government of Angola (GOA), in collaboration with partners such as WVA, UNICEF and the World Food Programme continued to address the issues of wasting and stunting through various programmes. Long term interventions to improve food security and agriculture have been the main focus from 2019 to 2022 with the strategy aiming to address the underlying factors such as food security, poor infant and young child feeding practices through educating mothers and caregivers, and early screening and referral for malnutrition. Additionally, strategies have focused on training health professionals to manage and treat both wasting and stunting. However, the current focus has been mainly on wasting with most programmes responding to the emergency situation with life-saving interventions. Stunting, however, also remains a significant concern with a prevalence of 38% reported in the most recent national survey (Angola National Institute of Statistics, 2016). Previous assessments between 2016 and 2020 show an average prevalence of stunting of 35% in the southern region, including Huila and Cunene, classifying it as very high according to WHO thresholds.

There is a need for specific strategic approaches to address WaSt including addressing the data and programmatic gaps. There is not much data available in the country on the prevalence of WaSt nor surveillance in programme delivery.

Unfortunately, WaSt prevalence has not been reported within recent nutrition surveys. In 2019, UNICEF partnered with WVA and the GOA for the implementation of two SMART surveys. The prevalence of acute malnutrition (weight-for-height <-2 SD) was 10.8% for Huila and 10.6% for Cunene. Recent data from a survey conducted in 2021 in Cunene by WVA, UNICEF and the GOA found a combined global acute malnutrition (GAM) (weight-for-height <-2 z-score and/or

MUAC <125 mm and/or oedema) prevalence of 12.4% (CI 10.1-15.2) among children 6-59 months of age. In Huila, combined GAM prevalence was 19.2% (CI 15.6-23.3). Neither of these surveys included WaSt as an indicator of interest.

Future programmatic implementation should include WaSt in programme assessments and should include children with WaSt as a priority group for treatment. A secondary analysis of recently surveys from 2019 and 2021 should be conducted to estimate WaSt prevalence and compare the trends in Cunene and Huila since 2016. There is a need to raise awareness among stakeholders in Angola on the issue of WaSt and its public health significance. In addition, there is a need to investigate the potential determinants such as food security, dietary intake, child age, sex and morbidity as these have been reported to influence WaSt (Garenne et al 2018). In Angola, understanding these factors will inform prevention and treatment strategies. Broader determinants such as poverty and economic status should also inform future approaches.

Nutrition partners in Angola should work with the GOA to determine the underlying drivers of WaSt leading to strategic programming approaches for the prevention and management with the overarching goal of reducing malnutrition-related child mortality. This analysis serves as an important reminder that malnutrition must be prevented and treated in a more comprehensive manner rather than through siloed programmes that consider one form of malnutrition independently from another.

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Patterns of wasting and stunting in Venezuela

This is a summary of the following paper:

Raffalli S & Villalobos C (2021) Recent patterns of stunting and wasting in Venezuelan children: Programming implications for a protracted crisis. *Frontiers in Sustainable Food Systems*, 5, 638042

<https://doi.org/10.3389/fsufs.2021.638042>

As protracted crises proceed, the problem of persistent wasting becomes increasingly evident. However, many humanitarian programmes that target wasting have a limited impact on the underlying causes that contribute to its persistence and on the mitigation of stunting. While usually described separately, wasting and stunting frequently co-exist (concurrence) with these children having an increased risk of mortality. This study calls into question the efficacy of humanitarian programmes and stimulates the debate on whether the nutrition sector should also consider stunting as a target in protracted crises.

This study reviewed the patterns of stunting and wasting among vulnerable children under five years of age in Venezuela which is experiencing a protracted refugee crisis. The study analysed 46,462 anthropometric records from children screened at Caritas Venezuela's Points of Care between 2017 and 2019. Based on the World Health Organization's 2006 growth standards, this study showed that from 2017 to 2019, the stunting prevalence increased from 28% to 32%, the wasting prevalence decreased from 15% to 11% and the concurrence of stunting and wasting slightly decreased from 5% to 4%.

The analysis also found that the odds of wasted children being stunted were 1.079 times greater than for non-wasted children. Similarly, the odds of stunted children being wasted were 1.085 times greater than for non-stunted children. Although age was not statistically associated with stunting, it did reduce the likelihood of being wasted.

Furthermore, each additional month of age reduced the odds of being concurrently wasted and stunted by 1.16%. The children's sex had a significant association with the probability of both stunting and wasting, whereby the odds of stunting and wasting were higher amongst boys compared to girls. This study also found sizable associations between food insecurity and both stunting and wasting. However, access to clean water was only associated with higher levels of wasting.

The authors suggested these findings indicate that stunting should be targeted as a humanitarian priority in protracted crises to mitigate the growth failure in children facing multiple nutritional deficiencies and as an approach for preventing persistent wasting.



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Postscript

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In Venezuela, warnings of a nationwide humanitarian crisis began in 2014. The first reports of an increase in acute malnutrition were registered by Caritas' sentinel sites in the country's poorest parishes. The increase of stunting and the massive out-migration are powerful indications of the protracted nature of the crisis. After five years of programme delivery, we analysed our datasets driven by concerns around coverage, relapse and reoccurrence rates and around

the urgency to guide our response beyond anthropometric recovery.

We found that practically all the children screened had some degree of growth retardation where they reached the < -2 SD weight-for-age Z-score (WAZ) threshold. More than 80% of these children were not wasted and therefore not admitted to the programme.

The Humanitarian Response Plan for Venezuela is still underfunded. Many humanitarian appeals are still not flexible towards including children at risk or supporting programming options for stunting mitigation. Access to humanitarian supplies, especially therapeutic options, is under constraint. Given these circumstances, we are trying to increase evidence for:

- Expanding the admission criteria to capture children at high risk of nutrition-associated mortality. We are validating the viability of options such as changes to

weight-for height Z-score (WHZ) thresholds, the use of WHZ and height-for age Z-score combined to capture children with concurrent wasting and stunting or using WAZ as an admission criterion (analysis in progress).

- Supporting the expanded admission criteria to cover children in the early stages of acute malnutrition aiming to reduce treatment duration, relapses and the demand for therapeutic foods.
- Improving the quality of protocols for stunted children.

Our aim is to meet humanitarian needs in such a complex and protracted crisis beyond a lifesaving approach, advocating for the mitigation of nutrition risk as early and for as long as necessary.

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Growth monitoring and mortality risk in low-birthweight infants

This is a summary of the following paper:

Mwangome M, Ngari M, Bahwere P, Kabore P, McGrath M, Berkley J. (2021). *Growth monitoring and mortality risk in low birthweight infants: a birth cohort study in Burkina Faso [version 2; peer review: 1 approved, 1 approved with reservations]*. *Gates Open Research*, 5,82.

<https://gatesopenresearch.org/articles/5-82>

Wasting and underweight in infancy is an increasingly recognised problem. However, there is a lack of consensus on how best to identify infants with the highest risk of mortality. In particular, there is uncertainty on interpreting anthropometry among low birth weight (LBW) infants who may be growing 'normally'.

This secondary data analysis examined the growth of infants from birth to two (the age of vaccination) and six months of age. Furthermore, the study investigated the overall risk of mortality among LBW infants and whether, among infants underweight at two and six months of age, LBW infants were associated with a lower risk of mortality than normal birth weight (NBW) infants. The study used data collected in 2004 from a birth cohort of 1,103 infants in Burkina Faso. The study used this dataset as it contains follow-up data of an untreated infant cohort that would now be challenging to generate. Anthropometry was performed monthly from

zero to 12 months of age. The study assessed associations with mortality using Cox proportional hazards models and assessed discriminatory values using the area under receiver operating characteristics curves.

Of the 1,103 infants, 21% were born LBW. Overall, 7.8% of all children died before their first birthday and 30% and 59% of these children died within two and six months of life, respectively. At two months of age, assessing weight gain since birth did not better discriminate mortality risk than a single anthropometric measure at the point of vaccination using weight-for-age (WAZ), height-for-age or mid-upper arm circumference (MUAC). These anthropometric measures were better predictors of mortality risk than weight-for-length. LBW was associated with an increased risk of death during the first year of life. LBW infants were also persistently more underweight during the first year of life. Among underweight infants at two and six months of age, LBW infants were not at a reduced risk of death compared to NBW infants.



An infant is being screened for malnutrition, Burkina Faso

Infants identified as underweight, irrespective of birth weight, are at increased risk of death and should receive targeted support. Using a MUAC cut-off of <11.0cm and WAZ < -3 when applied at two months (vaccination point) will effectively identify infants with a high risk of subsequent mortality. To reduce the risk of death among infants, research should focus on interventions to prevent LBW and on effective, comprehensive interventions to reduce mortality risks, such as the Management of At risk Mothers and Infants (MAMI) care pathway approach.

Treating high-risk moderate acute malnutrition using therapeutic food compared with nutrition counselling

This is a summary of the following paper:

Lelijveld N, Godbout C, Krietemeyer D, Los A, Wegner D, Hendrixson D et al (2021) *Treating high-risk moderate acute malnutrition using therapeutic food compared with nutrition counselling (Hi-MAM Study): a cluster-randomized controlled trial*. *The American Journal of Clinical Nutrition*, 114, 3, 955-964.

<https://academic.oup.com/ajcn/advance-article/doi/10.1093/ajcn/nqab137/6272382?guestAccessKey=7fa4bba8-701b-47a1-9978-e957e88a8cbd>

Currently, there is no consistent guidance on how best to manage children with moderate acute malnutrition (MAM). Often, MAM is not treated at all or treated with a variety of non-standardised approaches such as counselling or supplementary feeding. However, neither of these approaches have demonstrated acceptable recovery rates.

This study is a cluster-randomised controlled trial of 22 nutrition clinics in Pujehun District, Sierra Leone. The study investigated whether dividing MAM into high risk (HR-MAM) and low-risk populations and aligning the treatment

of HR-MAM children with that of severe acute malnutrition (SAM) would result in higher recovery rates and less deterioration than nutrition counselling alone.

In the 11 intervention sites, HR-MAM children were given ready-to-use therapeutic food (RUTF), amoxicillin – a routinely prescribed antibiotic for SAM cases – and nutrition counselling for two to 12 weeks. All other children received six weeks of nutrition counselling alone. The study defined HR-MAM as mid-upper arm circumference (MUAC) <11.9 cm, weight-for-age (WAZ) z score < -3.5, mother not the

primary caregiver or a child below two years of age not being breastfed. Outcomes were compared using intention-to-treat analysis which included 573 children at the intervention sites and 714 children at the control sites. Overall, 55% of children at the intervention sites were classified as HR-MAM. Short-term recovery was greater at 12 weeks at the intervention sites (48% compared to 39%). Children at the intervention sites had a lower risk of deteriorating to SAM (18% compared to 24%), a lower risk of death (1.8% compared to 3.1%) and greater gains in MUAC and weight than children at the control sites. However, by 24 weeks, the risk of SAM was similar between the two arms. Control group data identified recent illness, MUAC <12.0 cm, WAZ < -3, dropping anthropometry, being a twin, being below 12 months of age and a history of SAM as risk factors for deterioration.

The findings from this study suggest that nutrition counselling alone is insufficient for all children with MAM. The provision of RUTF and antibiotics to HR-MAM children improved short-term recovery and the short-term risk of deterioration. However, recovery rates were still sub-optimal and differences were not sustained six months after enrolment. A longer or more holistic package of interventions may therefore be necessary.

Facilitators of 'good' and 'poor' practice in the distribution of infant formula: Evidence from the 2014–2016 refugee crisis in Europe

This is a summary of the following paper:

Gribble K & Palmquist A (2021) 'We make a mistake with shoes [that's no problem] but... not with baby milk': Facilitators of good and poor practice in distribution of infant formula in the 2014-2016 refugee crisis in Europe. *Maternal and Child Nutrition*. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8710125/>

In low- and middle-income countries, early cessation of breastfeeding remains a concern with infants who are not breastfed having an eight times greater risk of death than their exclusively breastfed counterparts. However, it is often difficult to implement effective infant and young child feeding in emergencies (IYCF-E) interventions and the aid that is provided in emergencies can do more harm than good. Specifically, the inappropriate distribution of infant formula reduces breastfeeding rates which remains an important safeguard against child mortality.

Using a combination of qualitative research approaches – such as rapid ethnographic assessment, narrative elicitation, and semi-structured interviews with 33 individuals – this paper investigated factors that contributed to following 'good practice' or following 'poor practice' in relation to the Infant and Young Child Feeding in Emergencies Operational Guidance (OG-IFE) during the 2014-2016 European refugee crisis. Factors that contributed to 'good practice' were identified as the presence

of breastfeeding support, the presence of properly implemented formula feeding programmes, understanding that maternal choice to formula feed should be considered within the risk context of the emergency, and positive personal experiences of breastfeeding. Factors that contributed to 'poor practice' were the presence of infant formula donations, the absence of properly managed formula feeding programmes, the belief that maternal choice to formula feed is paramount and should be facilitated, and personal experience of insurmountable breastfeeding challenges and/or formula feeding.

The authors concluded that governments and humanitarian actors should ensure adequate resourcing of and preparedness for IYCF-E programmes, including adequate training. Additionally, organisations should incorporate maternity protection that enables employees to breastfeed as recommended, which can generate positive breastfeeding experiences among staff, who will then pass on good practice to the communities they work with.



A mother breastfeeds her child at a community care group in Malawi



A mother feeds her 2-year-old daughter, Diella, a healthy diet

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Nutrition and COVID-19 susceptibility? A systematic review

This is a summary of the following paper:

James P, Ali Z, Armitage A, Bonell A, Cerami C, Drakesmith H et al (2021) *The Role of Nutrition in COVID-19 Susceptibility and Severity of Disease: A Systematic Review*. *The Journal of Nutrition* 0, 1-25. <https://academic.oup.com/jn/article/151/7/1854/6274856>

Many nutrients have powerful effects on the immune system with the potential to alter susceptibility to COVID-19 infection, progression to symptoms, the likelihood of severe disease and survival. However, nutrition information has long been miscommunicated to the public and nutrition-related myths regarding COVID-19 protection and treatment have been widely prevalent during this pandemic. This review investigates the latest evidence on how malnutrition across all its forms (under- and over-nutrition and micronutrient status) may influence both susceptibility to, and the progression of, COVID-19.

The authors synthesised information on 13 nutrition-related components and their potential interactions with COVID-19: overweight, obesity and diabetes, protein-energy malnutrition, anaemia, vitamins A, C, D and E, poly-unsaturated fatty acids, iron, selenium, zinc, antioxidants and nutritional support. For each section they provided a) a background narrative review summarising the relevant material, b) a systematic search of the literature and c) a screen of six clinical trial registries. Searches took place between 16th May and 11th August 2020.

In the final narrative synthesis, the authors summarise 22 published articles, 38 pre-print articles and 79 trials. Despite the wealth of literature being published, the evidence directly linking nutritional status to the risk and progression of COVID-19 is still sparse due to the lack of high-quality data. The authors conclude that currently there is limited evidence that high-dose supplements of micronutrients will either prevent severe disease or speed up recovery. However, the results of clinical trials are eagerly awaited. Given the known impacts of all forms of malnutrition on the immune system, public health strategies to reduce micronutrient deficiencies and undernutrition remain of critical importance. Furthermore, there is strong evidence that the prevention of obesity and type-2 diabetes will reduce the risk of serious COVID-19 outcomes.

Food system transformation

This is a summary of the following paper:
Fanzo J, Haddad L, Schneider K, Béné C, Covic N, Guarin A et al (2021) Viewpoint: Rigorous monitoring is necessary to guide food system transformation in the countdown to the 2030 global goals. Food Policy, 104, 102163.
<https://doi.org/10.1016/j.foodpol.2021.102163>

Food systems that support healthy diets in sustainable, resilient, just and equitable ways can give rise to progress in eradicating poverty and malnutrition, protecting human rights and restoring natural resources. While food system activities have contributed to great gains for humanity, they have also led to significant challenges including hunger, poor diet quality, inequity and threats to nature. While it is recognised that food systems are central to multiple global commitments and goals, the current trajectories are not aligned to meet these objectives.

Food system transformation aims to generate a future where all people have access to healthy diets produced in sustainable and resilient ways that restore nature and deliver equitable livelihoods. Transformation is possible in the next decade but rigorous evidence is needed to keep progress on track. A comprehensive, science-based monitoring framework can support evidence-based policymaking and the work of those who hold key actors accountable in this transformation process.

The authors' paper proposes a monitoring framework centred around five thematic areas which arise from a systemic analysis of food systems, the entry points for change, established targets and goals and the necessary processes and capacities to bring about change. The authors developed working groups around each thematic area (shown in **bold**) to develop the following indicator domains:

1. **Diets, nutrition and health:** diet quality; food security; food environment; policies affecting food environments.
2. **Environment and climate:** land use; greenhouse gas emissions; water use; pollution; biosphere integrity.
3. **Livelihoods, poverty and equity:** poverty and income; employment; social protection; rights.
4. **Governance:** shared vision; strategic planning and policies; effective implementation; accountability.
5. **Resilience and sustainability:** exposure to shocks; resilience capacities; agrobiodiversity; food security stability; food systems sustainability index.

Recognising that this must be a multi-stakeholder process, the authors will use an adapted Delphi process to gather feedback on the thematic areas and indicator domains, identify candidate indicators and vet the selection of final indicators to be monitored. To spur accountability towards an inclusive food system transformation, the authors have issued a call for action. They hope others will contribute further evidence of successes and challenges and offer actionable recommendations based on this evidence.



MUAC screening for acute malnutrition at the community level in Niger

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Integration of severe acute malnutrition treatment in primary health care provided by community health workers in rural Niger

This is a summary of the following paper:
Ogobara Dougnon A, Charle-Cuellar P, Toure F (2021). Impact of integration of severe acute malnutrition treatment in primary health care provided by community health workers in rural Niger. Nutrients, 13(11).
<https://doi.org/10.3390/nu13114067>

In Niger, childhood malnutrition remains a public health problem. In the Maradi region, the prevalence of global acute malnutrition (GAM) reached 11.4% with 3.4% severe acute malnutrition (SAM) in the same year. Niger's community-based management of acute malnutrition (CMAM) policy dictates that SAM be treated by nurses in health facilities. However, the integration of SAM treatment into integrated community case management platforms has the potential to increase coverage through the community-based treatment of uncomplicated SAM cases by community health workers (CHWs). In parallel, there has been increased interest in simplified protocols for SAM treatment including the use of mid-upper arm circumference (MUAC) as a single criterion for treatment admission.

This study aimed to assess the impact of the integrated management of SAM by CHWs on treatment coverage in the Maradi region of Niger, with special attention given to anthropometric criteria for admission to treatment. A non-randomised controlled trial was implemented in two rural communes, Maïreyeye (control) and Guidan Amoumoune (intervention). The control group received outpatient treatment for un-

complicated SAM from health facilities while the intervention group received outpatient treatment from health facilities or CHWs. A total of 2,789 children aged 6–59 months were included in the study.

Results showed that the addition of CHWs as service-providers increased treatment coverage and CHWs maintained a good quality of care. In the intervention area, coverage increased by 3.1% and 77.2% of children were cured, compared to the control area where coverage decreased by 8.3% and 72.1% (below Sphere standard) were cured. Children managed by CHWs had a less severe anthropometric condition at admission and recovered seven days earlier than those treated exclusively at health facilities. In addition, a higher proportion of children admitted to treatment were identified by MUAC (33.9%) compared to weight-for-height z-score (12.1%) as the sole criterion. Expanding the MUAC cut-off to 125 mm as an admission criterion also allowed for almost all (99.5%) children identified by weight-for-height z-score to be admitted for treatment. These findings support a potential revision to Niger's protocols for the management of acute malnutrition to incorporate community-based management by CHWs.

False banana: the potential of Ethiopia's enset to address food insecurity in the face of climate change?

This is a summary of the following paper:

O Koch et al (2022) *Modelling potential range expansion of an underutilised food security crop in sub-Saharan Africa. Environ. Res. Lett.* 17 014022

<https://iopscience.iop.org/article/10.1088/1748-9326/ac40b2>

Despite substantial growth in global agricultural production, food and nutrition security is rising in sub-Saharan Africa. Current efforts to address food security through agricultural policies tend to emphasise increased productivity via inputs and technology. The adaptation of agricultural systems to support the diversification and resilience of global agrisystems under climate change, such as the identification of underutilised indigenous crops, may be a complementary strategy.

This research explores the potential to expand the range of cultivation of enset (*Ensete ventricosum*), a non-irrigated perennial banana relative. Despite high productivity and harvest flexibility, enset cultivation and consumption is restricted to southwestern Ethiopia where it provides a starch staple for around 20 million people. To predict the potential broader range for enset cultivation within southern and eastern Africa, the authors identify both bioclimatic suitability and communities in which enset expansion may be appropriate, looking both at the present and future bioclimatic distribution in which cultivation is viable, and the socioeconomic context in which adoption is feasible.

The study finds contemporary bioclimatic suitability for a 12-fold range expansion, equating to 21.9% of crop land and 28.4% of the population in the region. The inte-

gration of crop wild relative diversity, which has broader climate tolerance, could enable a 19-fold expansion, particularly to dryer and warmer regions.

While climate change may cause a 37%–52% reduction in the potential range by 2070, the authors identify an additional current population of 12.8 to 19 million Ethiopians for whom enset cultivation may address food and nutritional insecurity outside its current cultivation area. More broadly across East and Southern Africa, they identify 47 to 70.3 million people living in high priority areas – southern Uganda, eastern Kenya and western Rwanda. When incorporating the genetic potential of wild enset populations, they find cultivation might prove feasible for an additional 87.2 to 111.5 million people, 27.7 to 33 million of whom are in Ethiopia outside of enset's current cultivation range.

Local dietary preferences, culture, aspirations and livelihood systems are important factors determining the uptake of enset agriculture beyond its current range. As a perennial starch crop and with a fermented main food product, adaptation barriers for enset are expected to be smaller for communities that already cultivate perennial crops or use fermentation practices as part of their food culture. An example is the fermented products of cassava that are consumed in multiple countries, such as Uganda, Kenya and Tanzania, with projected suitability for enset cultivation.

Study protocol: Using locally produced foods to combat severe wasting in India

This is a summary of the following protocol paper:

Kumar P, Sinha R, Daniel A, Shah H, Sriswan R, Kokane A (2021) *Effectiveness of community-based treatment programs for treatment of uncomplicated severe acute malnourished children aged 6-59 months using locally produced nutrient dense foods: protocol for a multicentric longitudinal quasi-experimental study. BMC Nutrition*, 7, 85.

<https://bmcnutr.biomedcentral.com/articles/10.1186/s40795-021-00489-1>

While community management of acute malnutrition (CMAM) has been adopted in many countries worldwide, India is yet to have a formal national guideline for CMAM, due in part to a lack of consensus on the use of ready-to-use-therapeutic food. However, several states have decided to roll out community-based treatment for severe acute malnutrition (SAM), known as CSAM, using locally produced, nutrient-dense food supplements with different energy densities and nutrient compositions. Little is known about the effectiveness of the products used within the different CSAM interventions. This study protocol proposes to assess and compare the effectiveness of these programmes, looking at whether specific state interventions support recovery better than others and which intervention best reduces the risks of relapse and mortality.

A longitudinal quasi-experimental study will be undertaken in purposively selected districts in four different states rolling out CSAM (namely the states of Telangana, Madhya Pradesh, Odisha and Chhattisgarh). The study aims to enroll 200 children with SAM, without medical complications, in each state with anthropometric data taken at admission, in the sixth week of intervention and at discharge. Post-discharge, the children will be followed up for six months. Secondary outcomes will include mean weight gain, mean length of stay, body composition parameters and relapse and mortality rates. A further cost-effectiveness analysis will be conducted, estimating the total and incremental costs for each intervention and comparing these across the states.

The study is planned for a duration of 12 months. It is hoped that this study will contribute to the evidence on effective strategies to manage children with uncomplicated SAM in India



Processing local enset plants, Sodo district, Ethiopia

Mid-upper arm circumference tapes and measurement discrepancies: Time to standardise

This is a summary of the following paper: Rana R, Barthorp H, McGrath M *et al* (2021). *Mid-upper arm circumference tapes and measurement discrepancies: time to standardize product specifications and reporting*. *Global Health: Science and Practice*, 9(4): 1011.

<https://doi.org/10.9745/GHSP-D-21-00273>

Community-based management of acute malnutrition has been revolutionary in increasing the coverage of treatment for wasting in children 6-59 months of age. Early and effective case identification at the community-level through the measurement of mid-upper arm circumference (MUAC) taken with MUAC tapes has been critical to this success.

Alerted by programming experiences in Ethiopia, this article demonstrates how using MUAC tapes of different designs produces different measurements. In comparing two commonly used MUAC tapes, a 2 mm error was found, which excludes 27% of “true” cases with a true MUAC of less than 115 mm. Consequently, using tapes of different thicknesses without accounting for these in the tape design, introduces a systematic bias in case identification. This may impact whether or not a child is eligible for treatment, potentially excluding at-risk children from receiving care. In addition, since research does not currently report on the MUAC tapes used, this may have implications on the validation of current thresholds used to identify malnutrition.

In a call to action, the authors make a number of recommendations to ensure common design specifications and standardised reporting, to ensure all eligible at-risk children have an equal chance of being identified for timely, appropriate treatment. These include: (1) using a fixed thickness of MUAC tape; (2) shifting of the ruler to account for different thicknesses should they be used; (3) incorporating calibration checks as standard practice when MUAC tapes are used; (4) documenting which tapes are used in all future work; and (5) a broader examination of the potential implications of these findings for current MUAC thresholds.



Malnutrition screening in communities affected by the ongoing conflict in Tigray

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Saving children from man-made acute malnutrition in Tigray, Ethiopia: A call to action

This is a summary of the following commentary:

Mulugeta A & Gebregziagbher M (2022) *Saving children from man-made acute malnutrition in Tigray, Ethiopia: a call to action*. *The Lancet*.

[https://www.thelancet.com/journals/langlo/article/PIIS2214-109X\(22\)00023-7/fulltext](https://www.thelancet.com/journals/langlo/article/PIIS2214-109X(22)00023-7/fulltext)

The ongoing conflict in Tigray, Ethiopia has led to a humanitarian crisis made even more complex by the blockade of humanitarian aid, the destruction of health facilities and the displacement of millions. As a result, extreme hunger conditions have been reported with children facing increasing risks of acute malnutrition. However, obtaining accurate estimates of malnutrition prevalence in children under five years of age in the region is incredibly challenging.

Between July and August 2021, a team of experts from the College of Health Services at Mekelle University and the Tigray Health Bureau conducted a rapid nutrition assessment to determine the prevalence of acute malnutrition in Tigray and to compare estimates with previous survey data collected prior to the onset of the emergency. Malnutrition in children under five years of age was measured using mid-upper-arm circumference (MUAC) and household food insecurity was measured using the Household Food Insecurity Access Scale (answered by the children’s caregivers). In total, 3,269 children were accessed from 48 randomly selected districts in Tigray. Districts that had security and access issues were not included in the random selection process and the results of the survey.

The analysis indicated that 6% of children surveyed had severe acute malnutrition (SAM)

(MUAC <115mm), 22% of children were indicated to have moderate acute malnutrition (MAM) (MUAC ≥115mm and <125 mm). Thus, global acute malnutrition (GAM, a term used to capture definitions of both severe and moderate acute malnutrition) was predicted to be 28%. These estimates showed significant increases from the 2019 estimates (prior to the conflict) wherein SAM prevalence was estimated to be 1%, MAM prevalence was an estimated 8% and GAM was estimated to be 10%. Household food security was also estimated to have dropped sharply from 59% in 2019 to 15% in 2021.

The authors noted that the sharp increase in acute malnutrition prevalence and the significant decline in food security was a direct consequence of the conflict and the subsequent inaccessibility to humanitarian aid and functioning health services. Furthermore, 2021 prevalence figures were likely to be underestimates as the districts with the highest levels of insecurity were not included in the survey. The authors suggested the urgent need for the integration of adequate nutrition interventions into early childhood development policies and health systems. They called on public health and medical communities, and particularly the nutrition community, to advocate for the needs of children in Tigray to reduce the burden of malnutrition and related childhood mortality.



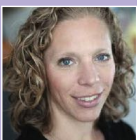
MUAC screening reveals severe acute malnutrition (SAM) in this drought affected community, Somalia

© UNICEF/Ismael Taha/2022

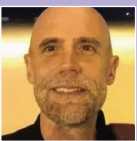


Casual factors of wasting in Africa: What can be gleaned from available data?

This article reviews available national data from Africa to examine to what extent wasting could be explained by the underlying causes of malnutrition and/or contextual factors



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We are grateful to Johns Hopkins Bloomberg School of Public Health students Cindy Hwang and Charissa Liu for their support in data extraction and manuscript preparation. We would also like to acknowledge Ellyn Yakowenko and Alice Stevenson, both at Action Against Hunger US, for their critical role in the implementation of the broader project that supported this work. This analysis was conducted under the "Strengthen Data for Nutrition Programmes – Driving a data revolution to mitigate the impact of shocks and disasters on malnutrition" which was funded by the United Kingdom Foreign, Commonwealth and Development Office.

AFRICA

Key messages:

- The national analysis inclusive of 42 countries in Africa found that, in locations where national wasting prevalence exceeds 10%, measures of drought risk and frequency are moderately correlated with wasting, suggesting a positive relationship between drought and wasting in countries with a higher wasting prevalence only.
- Findings from this analysis highlight the difficulties of identifying the risk factors of wasting and the limitations of using available data to inform policy and programme decision making.
- Given these limitations, policy makers and programme implementers must rely on context-specific approaches to analyse the drivers of wasting although these are likely to be variable in frequency and in the quality of implementation.

The burden of wasting

Wasting, the most visible form of undernutrition, affects an estimated 47 million children under five worldwide, with more than two thirds of all wasted children living in Asia and more than one quarter in Africa (UNICEF/WHO/WB, 2020). While wasting is apparent in non-crisis and crisis settings alike, high wasting prevalence rates are commonly observed in humanitarian settings where high rates of disease and acute food insecurity are triggered by conflict and/or climate shocks. The association between conflict and wasting has been demonstrated in locations such as Nigeria, Sudan, Ethiopia and Somalia (Howell et al 2018; Rowhani et al 2011). Other factors that increase wasting risk include diarrheal disease, excess rainfall, food price shocks and climate shocks (Brown et al 2020). Factors that mitigate wasting risk include birth in a health facility, higher levels of maternal education, household income/wealth, water and sanitation quality and higher per capita gross domestic product (GDP). However, a lack of

consistency across the studies highlights the need for further exploration of wasting predictors.

This paper reviews the available national data from Africa to examine to what extent wasting could be explained by the underlying causes of malnutrition and/or contextual factors. A sub-national analysis was also conducted, utilising data from Link Nutrition Casual Analysis (Link NCA) reports, to identify potential commonalities across locations where data was available for lower-level administrative areas. Link NCA is a structured approach developed by Action Against Hunger that combines quantitative surveys and participatory methods to analyse causes and mechanisms leading to undernutrition.

Methods

The analysis focused on Africa due to the relative availability of data on causal factors and the occurrence of conflicts and crises – both acute and protracted – which are likely to contribute to rapid changes in wasting prevalence.

Table 1 Included Link NCA reports from Africa (n=19)

Link NCA reports Africa (n=19) and sub-national data comparison sources

- Burkina Faso (Tapao region, 2013)
- Central African Republic (Mambéré-Kadeï/Sangha-Mambéré, 2016)
- Chad (Abdi district, Ouaddai, 2015; Kanem, 2012)
- DR Congo (Kasai Occidental, 2014)
- Ethiopia (Hararghe, 2014; Sidama, 2014; Borena, 2016)
- Kenya (Isiolo, 2013; West Pokot, 2015; Nairobi, 2016/17)
- Madagascar (Southern Region, 2018)
- Mali (Kaarta, 2016/17)
- Mauritania (Guindimakha, 2016)
- Mauritania/Senegal (Walo transborder Area, 2016/17)
- Niger (Maradi Region, 2016/17)
- Nigeria (Yobe State, 2017)
- South Sudan (Aweil East, 2011)
- Uganda (Karamoja, 2016)
- Zimbabwe (Masvingo, 2011)

National Level Analysis

The national analysis sought to identify the associations between wasting prevalence and national level data on contextual factors including the basic and underlying causes of undernutrition for 41 African countries with additional analysis for countries with wasting prevalence above 10% (n=13). National level estimates of wasting prevalence were obtained from the UNICEF/WHO/World Bank Group 2019 Joint Child Malnutrition Estimates. Countries where data collection was conducted more than a decade ago (n=1, Libya) were excluded. Data from other sources was matched to the year or closest available year of the malnutrition data. Some indicators for South Sudan were not available because malnutrition data was collected prior to independence in 2010. Indicators were sourced from the INFORM Risk Index which assesses risk for humanitarian crises and disasters (Joint Research Center of European Commission, 2019). Selection was based on previously identified relationships in the UNICEF conceptual framework (UNICEF, 2013). Measures of conflict included conflict intensity, uprooted people and conflict deaths reported by the Uppsala Conflict Data Program (2019). Measures of drought included drought risk and affected population from the INFORM Risk Index and drought affected populations as reported in the Emergency Events Database (Center for Research and Epidemiology in Disasters, 2019). Food security indicators were availability, access, utilisation and a summary level composite indicator reported by the INFORM Risk Index. Measures of governance included the Fragile States Index score and index category scores (Fund for Peace, 2019) and World Bank Country Policy and Institutional Assessment (CPIA) scores (African Development Bank, 2019). Development indicators that were assessed included per capita GDP, the Human Development Index (HDI), the multi-dimensional poverty index and the INFORM Risk Index development and deprivation score. Related inequality indicators that were included were the GINI index, the INFORM Risk Index inequality score and the INFORM Risk Index aid dependency score (Joint Research Center of European Commission, 2019; World Bank 2019). Analysis was conducted using Microsoft Excel 365 and Pearson's correlation coefficient was applied to

assess the strength of association between national indicators and wasting prevalence.

Link NCA Analysis

The Link NCA analysis examined sub-national data, typically from a single region within a country, to explore information on the underlying and immediate causes of undernutrition that were not available at a national level. Link NCA

combines quantitative child nutrition surveys with participatory methods to generate consensus on causality and major risk factors. There were 19 available Link NCA reports from Africa available online in late 2019 (inclusive of surveys between 2010 and 2018) including 16 from countries affected by conflict or recurrent climatic shocks (Table 1). One country was excluded from the analysis due to heterogeneity. This analysis builds off the approach used by Dodos et al (2017) to group causal factors for undernutrition with the aim of summarising Link NCA findings from African countries affected by conflict or recurrent climatic shock. The analysis explored if Link NCA findings produced similarities across multiple settings that could be grouped into 'typologies' and compared Link NCA findings to other commonly available sources of similar sub-national indicators including Multiple Indicator Cluster Surveys (MICS), Demographic and Health Surveys (DHS) and Standardised Expanded Nutrition Surveys (Table 1). This sub-national analysis involved data visualisation and categorisation to assess commonalities across locations and did not include statistical testing; all analysis was conducted using Microsoft Excel 365 and used publicly available data.

Table 2 Correlations of national indicators and national prevalence of wasting

	Wasting Prevalence			Wasting Prevalence ≥ 10%		
	(n=42 countries)			(n=12 countries)**		
	Correlation Coefficient	R-squared	p-value	Correlation Coefficient	R-squared	p-value
Development Indicators						
Per capita GDP	-0.14	0.020	0.37	0.262	0.068	0.41
LIC	-0.076	0.006	0.73	-0.09	0.080	0.85
LMIC	-0.234	0.055	0.34	-0.161	0.026	0.80
Human Development Index	0.324	0.105	0.04*	-0.179	0.032	0.58
Multi-Dimensional Poverty Index	0.153	0.023	0.39	-0.668	0.446	0.07
INFORM Index Inequality	-0.110	0.012	0.50	-0.341	0.116	0.33
Governance						
Fragile States Index	0.322	0.104	0.04*	-0.012	0.000	0.97
Warning	0.204	0.041	0.26	-0.330	0.109	0.43
Alert	0.744	0.544	0.01*	0.754	0.568	0.25
World Bank CPIA	-0.412	0.170	0.03*	-0.208	0.043	0.54
Not fragile	0.065	0.004	0.80	--	--	--
Fragile	-0.236	0.056	0.46	0.254	0.640	0.58
Crisis Situation						
INFORM Index	0.385	0.148	0.01*	-0.022	0.000	0.95
Medium or Low Risk	0.334	0.112	0.14	0.817	0.668	0.18
High/Very High Risk	0.492	0.242	0.02*	0.186	0.035	0.66
Coping Capacity	0.377	0.142	0.01*	0.146	0.021	0.65
Conflict						
INFORM Conflict Risk	0.093	0.009	0.56	-0.074	0.006	0.82
INFORM Conflict Intensity	0.292	0.085	0.06*	-0.092	0.008	0.78
Conflict Deaths (UCDP)	0.312	0.097	0.04*	-0.11	0.012	0.81
INFORM Uprooted People	0.376	0.142	0.01*	0.213	0.046	0.51
Drought						
INFORM Drought Risk	0.387	0.149	0.01*	0.682	0.465	0.01*
INFORM Drought Frequency	0.258	0.066	0.10	0.651	0.424	0.02*
INFORM Drought Affected	0.046	0.002	0.77	0.314	0.098	0.32
Food Security						
INFORM Food Access	0.309	0.095	0.10	0.527	0.278	0.28

*statistically significant correlation (p<0.05)

**includes Chad, Comoros, Djibouti, Eritrea, Ethiopia, Gambia, Mali, Mauritania, Niger, Nigeria, Somalia and Sudan

Findings

National level analysis

Findings for all African countries (n=42) and countries with wasting >10% (n=12) are presented in Table 2. When looking at all countries, no indicators were strongly correlated with wasting where the correlation was statistically significant. Indicators with statistically significant, weak correlations included the HDI, the Fragile States Index and the World Bank CPIA score as well as various crisis indicators such as the INFORM Risk Index, conflict mortality and displacement and drought risk. When examining only countries that were classified as fragile states, the only strong, statistically significant correlation was the Fragile States Index score (Coeff=0.744, p=0.01).

The analysis of a sub-set of 12 countries with wasting prevalence above 10% also yielded few significant correlations of national level indicators and wasting prevalence. However, two measures of drought – the INFORM Risk Index for drought (Coeff=0.682, p<0.01) and frequency scores (Coeff=0.651, p=0.02) – had strong correlations with wasting prevalence. This indicated that in contexts with elevated wasting prevalence, drought is associated with higher rates of wasting. There was a strong negative association between the multi-dimensional poverty index and wasting that was marginally statistically significant (Coeff=-0.668, p=0.07).

Link NCA analysis

Between six and 13 risk factors were identified in the 18 included Link NCA studies with an

average of 9.1 risk factors per study (Table 3). Risk factors were categorised into five areas: food security and livelihoods, maternal mental health and childcare practices, water and sanitation, health and other risks. Water and sanitation factors were the predominant concern in 28% of Link NCAs followed by maternal mental health and care practices (22%), food security and livelihoods (17%) and health (6%). In 28% of Link NCAs causal factors were spread equally across two or more categories. Seven Link NCAs observed high wasting prevalence, defined as ≥14.5%, and in three of these (Mauritania 2016, Nigeria and South Sudan) water and sanitation risk factors were the most frequently reported.

Comparison between the number of Link NCA causal factors in a particular category (e.g., health, water and sanitation) and the available indicators related to that category (e.g., under five mortality, vaccination coverage, breastfeeding, access to improved water and sanitation) yielded no strong correlations that were statistically significant. Statistically significant moderate correlations were observed between the number of Link NCA risk factors and access to improved water sources (Coeff=0.456, p=0.05) and the minimum acceptable diet among breastfed children (Coeff=0.481, p=0.04). There was a moderate statistically significant positive correlation between the Link NCA wasting rate and access to improved water (Coeff=0.565, p=0.012), surprisingly reflecting a rise in wasting prevalence as access to improved water sources increased. Negative, weak, yet statistically significant cor-

relations were found between the Link NCA wasting rate and the minimum acceptable diet among breastfed children (Coeff=-0.483, p=0.04) and measles vaccination coverage (Coeff=-0.484, p=0.04) indicating lower wasting prevalence in areas with higher vaccination coverage and better child feeding practices.

Discussion

The analysis of national level data showed no strong correlations between wasting prevalence and measures of governance, crises – including drought and conflict – and food security that were statistically significant. In the sub-set of countries with wasting prevalence >10%, both drought risk level and drought frequency has moderate, statistically significant associations with wasting prevalence. The national analysis indicates data at this level is not well correlated with wasting and therefore has significant limitations with respect to predictive value. This is likely as result of the resolution (i.e., reporting at higher level administrative units such as state/province) which may mask the relationships observed at lower levels, the immense number of confounding factors and the reporting differences including data collection frequency and timing. Of particular importance when considering wasting as an outcome is seasonal variations in prevalence which is a critical limitation for an analysis that seeks to incorporate multiple data sets where wasting prevalence was observed at different points of seasonal calendars. A lack of significant correlations was not unsurprising given the many limitations inherent to the analysis of

Table 3 Occurrence of risk factors rated as 'major' across Link NCA studies

Link NCA Location and Year		Food Security & Livelihoods	Maternal Mental Health & Children's Care Practices	Water & Sanitation	Health	Other Risks	Total	Wasting*
CAR	West CAR 2016	3	2	1	1	3	10	2.4%
Chad	Kanem 2012	1.5	2	1	1	1.5	7	19.0%
	Ouaddai 2015	1	1	2	3	0	7	15.9%
DR Congo	W Kasai 2014	0	2	2	2	0	6	8.2%
Ethiopia	Hararaghe 2014	1	3	1	1	0	6	12.0%
	Sidama 2014	5	3	3	0	1	12	5.6%
	Borena 2016	0	5	1	0	3	9	11.1%
	Gambella 2018	3	5	4	1	0	13	20.4%
Kenya	Isiolo 2013	5	2.5	3	1	0.5	12	11.5%
	W Pokot 2015	3	1	2	1	0	7	12.8%
	Nairobi 2017	1	3	5	1	1	11	5.6%
Mali	Kaarta 2017	3	3	3	2	1	12	12.1%
Mauritania	Guindimakha 2016	2	1	3	0	1	7	15.1%
	Senegal border 2017	2.5	2	1	1	1.5	8	14.6%
Niger	Maradi 2017	1	2	3	1	0	7	11.4%
Nigeria	Yobe 2017	2	1	4	2	1	10	14.6%
South Sudan	Aweil East 2011	1	2	3	1	1	8	18.3%
Uganda	Karamoja 2016	2	5	2	2	1	12	13.2%
Percent of Link NCAs w/risk factor		88.9%	100.0%	100.0%	83.3%	66.7%	100.0%	
Total risk factors (all Link NCAs)		34	43.5	43	20	13.5	154	
Average risk factors (per Link NCA)		2.1	2.5	2.4	1.2	0.9	9.1	

*Within the Link NCA analyses, the term wasting is defined as global acute malnutrition and/or the presence of oedema

Note: Orange shading denotes the category with the most risk factors; yellow shading denotes categories that had the next highest number of risk factors reported (and instances where there was no category with more risk factors reported). In some countries, risk factors were given a score of 0.5 if they were considered to be of lesser importance.

existing data from different sources and was the impetus for the Link NCA analysis. However, many indicators correlated with wasting came from the INFORM Risk Index suggesting that further analysis of various INFORM indicators and their components may be of value, in particular since they are updated annually and reflect higher-risk contexts where wasting rates are likely to fluctuate and may often exceed emergency thresholds. While findings from this analysis do call into question the value of attempting to use existing data to inform the understanding of the drivers of wasting, the regularity of INFORM Risk Index data collection and the planned expansion of sub-national INFORM Risk Index data may improve predictive values in future analyses.

In Link NCAs, water and sanitation and maternal mental health and children's care practices were the most frequently reported types of risk factors followed by those related to food security and nutrition. Water and sanitation risk factors were the most frequently reported type of risk factor in three of seven locations with elevated wasting prevalence. Interestingly, no Link NCA with high wasting prevalence found that food security and livelihoods-related casual factors were the most frequently reported casual factors of malnutrition (when assessed as counts of sub-factors per sector) which is somewhat surprising given that high levels of food insecurity are often associated with a rise in wasting prevalence in emergency settings. The lack of clear findings from the Link NCA analysis is likely the outcome of several limitations. First, temporal and geographic variation across the data sets being compared is a significant limitation and, as noted in the national level analysis, wasting prevalence varies seasonally and it is likely that the relative importance of drivers of wasting also vary by season. Second, the Link NCA analysis involved data categorisation and visualisation to assess commonalities across locations but statistical testing was not feasible. Third, the Link NCA approach does not rank casual factors or have an objective process for identifying which factors are of greatest importance in a particular context, making the interpretation of findings and the relative importance of certain types of risk factors or risk factor categories (e.g., food security, water and sanitation) challenging. In summary, there are numerous limitations to secondary data analysis, notably the lack of available data at lower-level administrative units and reporting periods or geographical units that do not align including seasonal variations in wasting that limit the conclusions that can be drawn from the available data.

The Link NCA methodology is a consensus building approach where factors are not ranked but instead categorised; consequently, risk factor identification is potentially biased by the types of technical experts involved (e.g., water and sanitation, food security and livelihoods) and group dynamics. While Link NCA employs strong data collection methodologies and uses a mixed-methods approach, it does not have



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A child being screened for malnutrition in Southern Tigray in Ethiopia

an objective process for identifying priorities or examining the strength of association between the various casual factors and wasting which is a significant limitation. While the Link NCA methodology employs a participatory approach to gain a nuanced understanding of the casual factors of undernutrition in a particular context, a more structured and systematic method for the characterisation of the relative importance of the casual factors identified could enhance the utility of findings for nutrition programme and humanitarian response decisions making.

Conclusions

The national analysis inclusive of 42 countries in Africa found that in locations where national wasting prevalence exceeds 10%, measures of drought risk and frequency are moderately correlated with wasting, suggesting a positive relationship between drought and wasting in countries with a higher wasting prevalence only. Comparison of Link NCA wasting prevalence to regional-level survey data found few low or moderate level associations between indicators indicating that, even at a sub-national level, available indicators such as MICS or DHS data may not be correlated with wasting prevalence;

this is not entirely unexpected given that wasting prevalence fluctuates and many indicators are infrequently collected. The only moderate or high correlation that was statistically significant was a positive correlation between wasting prevalence and access to improved water sources which was unexpected.

Findings from this analysis highlight the difficulties of identifying the risk factors of wasting and the limitations of using the available data to inform policy and programme decision making. Given these limitations, policy makers and programme implementers must rely on context-specific approaches to analyse the drivers of wasting although these are likely to be variable in frequency and in the quality of implementation. Further attention to strengthening the methodologies of context-specific assessments and the use of existing programme data could both inform programmes and policies at the local level and contribute more broadly to a regional and global understanding of the casual factors of wasting.

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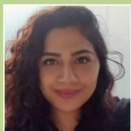
Food systems for safe, nutritious and affordable diets in central Sahel

This article provides the findings and recommendations of a literature review and a series of consultations that were conducted at regional and national levels to gather information on national food systems in three countries of Central Sahel



A beneficiary of cash transfers cultivates cucumber in the Sahel region, Mali

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SAHEL REGION

Key messages:

- The literature review and the regional and national consultations provided an in-depth understanding of local food systems in Burkina Faso, Mali and Niger.
- The integration of nutrition into nutrition-sensitive sectoral policies, strategies and programmes to ensure a diverse, safe and affordable nutritious diet for all was lacking.
- The regional consultations have created strategic opportunities for engaging and collaborating with key stakeholders to transform food systems, build resilience against future shocks and ensure food systems contribute to improved food and nutrition security for all.

Introduction

Over the past 50 years, the countries of the Central Sahel region (Burkina Faso, Mali and Niger) have experienced a significant rise in shocks and stressors which have negatively affected regional food and nutrition security (Re, 2021; Sib, 2021). These include extreme climate events (drought and flooding), recurrent pest infestations and zoonotic diseases, protracted conflict with mass population displacement (Bantchey, 2021) and food price volatility.

In 2020, an already challenging situation was compounded by the COVID-19 pandemic resulting in an expected 2.9 million wasted children under five years of age in the region (the Sahel and West Africa Club /OECD, 2020). More than 50% of households in these countries remain unable to afford a nutritious diet due to factors such as limited food availability, poor supply chains, low economic access, distant or limited access to food markets and conflict (Government of Burkina Faso, 2020; Government of Mali, 2020; Government of Niger, 2020). These factors combined have negatively impacted food insecurity

and malnutrition. To tackle this multi-faceted issue, systematic and multi-sector approaches are required to make safe and nutritious food accessible for everyone, everywhere, all the time.

Based on long-term, successful collaborations with national governments, regional institutions and other food system stakeholders, the World Food Programme (WFP), Action Against Hunger (ACF) and the Permanent Inter-State Committee for Drought Control in the Sahel (CILSS) have together initiated a regional food systems study aiming to inform recommendations to strengthen the food systems in the Central Sahel region.

Gathering information on food systems

The study was carried out between December 2020 and November 2021. It consisted of a literature review and a series of consultations, conducted at regional and national levels, to gather information on food systems.

The literature review was conducted to determine the challenges faced by

current food systems and how these challenges affect access to and the availability and affordability of a nutritious diet in Central Sahel. This review intended to illustrate the links between regional and national food production, availability, market access and functionality, supply chains, purchasing power, food and nutrition security and the environment.¹ The study was structured around three axes that aimed to assess existing value chains and supply chains (axis 1), food policies and governance structures (axis 2) and food and nutrition security, food safety and quality and consumption behaviours (axis 3) (Gueye Niang, 2021).

As part of this study, WFP, ACF and CILSS co-hosted an online regional consultation on transforming food systems for safe, healthy, nutritious and affordable diets in Central Sahel between the 1st and 3rd of June, 2021. The consultation brought together 80 participants from the government, development partners, the private sector and academia from the region with the aim of:

- Developing a common understanding around the study's objectives and approaches for assessing regional food systems
- Developing a common narrative around the key challenges and unused opportunities in national and regional food systems
- Developing and validating recommendations and priority actions for food systems to produce safe, nutritious and affordable diets for all.

Similar consultations were then rolled out in July 2021 at the national level in Burkina Faso, Mali and Niger in order to build the capacity of local professionals, create collaborative partnerships and ensure government 'buy-in' for the formation of optimal food systems.

During the consultations, one study axis was prioritised each day with key regional and national experts providing presentations and leading group discussions.

Key findings

The literature review and the regional and national consultations provided an in-depth understanding of the local food systems in Burkina Faso, Mali and Niger. The main findings categorised by each study axis are summarised below and presented in Box 1 alongside associated recommendations.

Agricultural production in the three countries was primarily focused on cereals which means that most households consumed an energy-only diet. Agricultural investment policies remained mainly focused on cereal production to the detriment of food availability, affordability, access and consumption, dimensions that heavily influence food and nutrition security. However, in recent years, optimised irrigation techniques and an increase in demand for nutritious foods have led to the creation of institutional structures that focus on off-season crops and fresh food production.

Food-processing systems remained underdeveloped due to a comparative lack of technology, equipment and primary processing facilities.

Market functionality was limited and linked mainly to high and/or unstable food prices, poor infrastructure and suboptimal food quality and services. The market price and household affordability of safe and nutritious foods were impor-

tant determinants of the food choices affecting the food security, nutrition and health of the Burkinabe, Malian and Nigerien populations.

Persistent conflict, recurrent climatic shocks and the onset of COVID-19 were major limiting factors for local food systems which resulted in a high variation in the cost of nutritious foods across the three countries. These stressors had negatively affected livelihoods, household purchasing power and nutritious food access and had worsened food insecurity and all forms of malnutrition.

Current food policies and strategies had limited linkages with nutrition-sensitive sectors and the private sector. Although work was ongoing to scale up nutrition-sensitive social protection programmes which integrate food security and nutrition outcomes and target the most nutritionally vulnerable populations, the social protection sector was rarely used as a vehicle to address food and nutrition insecurity in the three countries.

The role of women was a major theme highlighted during the consultations. Women are a major contributor to food systems in Central Sahel (Gnisci, 2016). They account for 89% of agricultural employment in these countries. Working side-by-side, women and men cultivate the same crops and tend to the same livestock for local consumption and selling in markets. However, persistent gender inequalities regarding access to resources, higher value land, credit, agricultural inputs and education continue to hold women back and undermine regional food systems (Tall, 2021). To ensure and secure women's roles within the food system, their access to resources and the existing power imbalances need to be addressed through technical and financial support to women's farming organisations, integrating gender into all national policies related to agriculture, food production and ownership rights and improving data availability disaggregated by gender (Sow, 2021).

Social protection consists of government-led policies and programmes that prevent and protect people from poverty, vulnerability and social exclusion throughout life (Samoura, 2021; Ocampo, 2021). These programmes can improve access to basic services, reduce negative coping skills in response to shocks and improve accessibility to and the affordability of nutritious foods therefore increasing dietary diversity and caloric intake. Social protection is at its most effective when food and nutrition security is embedded in national social protection policies and programmes while beneficiary targeting, transfer amounts and modalities are adapted to the basic and nutritional needs of the most vulnerable populations (women and children) (Gnisci, 2016; Ghooos, 2021).

With this context in mind, the WFP has implemented a multi-pronged approach, the CRIALCES project – Food Crisis Response in the Central Sahel: Nutritional Support and Recovery for Burkina Faso, Niger and Mali (2020–2024) (Ghooos, 2021). This project aligns food production, processing, logistics, markets and consumption to improve the nutritional status of vulnerable populations and to strengthen the resilience of communities. Supply side interventions include providing farmers with productive assets, capacity-building on climate-smart agriculture practices

and creating market linkages. The project also addresses food processing by building the capacity of private sector manufacturers, strengthening institutional frameworks and quality management systems for fortified blended foods and food fortification. Demand side interventions include a voucher for locally available nutritious foods and SBCC to improve the dietary practices of and prevent malnutrition among children and pregnant and lactating women. Lastly, the project builds government capacity to systematically measure and analyse the impact of shocks or seasonal changes on the availability and affordability of nutritious foods and to adapt the voucher and project interventions as needed.

Conclusion

The study showed that food systems are central to resolving the food and nutrition security issues within the three countries of Central Sahel and strong political commitment aimed at harmonising supply and demand is also essential to progress. The integration of nutrition into nutrition-sensitive sectoral policies, strategies and programmes to ensure a diverse, safe and affordable nutritious diet for all was, however, lacking.

CILSS, the WFP and ACF are uniquely placed to strengthen food systems for safe, nutritious and affordable diets for all in Central Sahel. The regional consultations have created strategic opportunities for engaging and collaborating with key stakeholders such as the Economic Community of West African States, the Sahel and West Africa Club Secretariat, the Network of Peasant Organizations and Agricultural Producers of West Africa and the Regional Food Crisis Prevention Network to transform food systems, build resilience against future shocks and ensure that food systems contribute to improved food and nutrition security for all.

Preliminary results, key messages and recommendations from the study were presented at the Regional System for the Prevention and Management of Food Crises (PREGEC) meeting in November 2021. The PREGEC cycle, coordinated by CILSS, consists of four regional-level technical consultations conducted annually in March, June, September and November. These consultations focus on current food and agricultural production, forecast agricultural production for the next year and consider the food and nutrition security situation. These consultations offer an opportunity to continue the work laid out in this research article and to communicate policy recommendations to all stakeholders in the region with the aim of improving food systems for safe, nutritious and affordable diets for all.

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¹ All relevant publications on the current state of food systems in Central Sahel were identified through PubMed, BMC, the Organization for Economic Cooperation and Development E-Library, the World Bank Open Knowledge Repository, the African Development Bank Knowledge Platform and Google Scholar. Additional documents and reports on food systems were shared by regional experts from CILSS, the Economic Community of West African States, the Sahel and West Africa Club, the Network of Peasant Organizations and Agricultural Producers in West Africa and the Regional Network for the Prevention of Food Crises.

Box 1 Key findings and recommendations by study axis

Axis 1: Analysing food systems and value chains for safe, nutritious and affordable diets for all in Central Sahel

Strong, productive and competitive food production and processing systems are essential for safe, nutritious and affordable diets for all in Central Sahel.

1. Create strong agricultural production systems through mechanisation, risk management, capacity-building, improving infrastructure and developing policies, strategies and frameworks conducive to equity.
2. Safeguard productive and competitive production systems through female inclusion, improving women's land rights and the expansion of financial resources for women-led farmers' organisations.
3. Develop local processing systems that use drying, cooking, roasting and frying to preserve, process and package high-quality nutritious products by providing food companies with real-time hands-on training, modern and high-tech equipment and food safety and quality management while improving governance, infrastructure and involving the private sector.
4. Achieve economies of scale by developing coordination systems and harmonising standards, procedures and research and development for agricultural inputs and products for regional integration and competitiveness.
5. Improve the market infrastructure with a holistic approach that integrates supply and demand. This approach should place more emphasis on engaging with local governments, the private sector and civil society to address food issues through nutrition-focused policies and institutional/governance structures. It should also advocate for a multi-sector approach centered on rural development, urban planning, waste management and food processing.

Axis 2: Analysing international, regional and national food system policies, strategies and regulatory frameworks favourable to safe, nutritious and affordable diets for all in Central Sahel

Harmonisation and the strong coordinated implementation of regional and national policies, strategies and regulatory frameworks that place the nutritional needs of all at the centre, with specific attention to the most nutritionally vulnerable groups, women and children, are required for safe, nutritious and affordable food systems in Central Sahel.

1. Harmonise and strengthen the implementation of regional policies, strategies and regulatory frameworks that promote diversified and safe production, processing and distribution. Encourage intra-regional trade and ensure regional responsibility and governance for safe, nutritious and affordable diets.
2. Strengthen food systems through the development of nutrition-sensitive agricultural policies and programmes that place the nutritional needs of its population at the centre, promote fiscal and trade restrictions on sugary drinks, provide nutritious school meals and use widespread social behaviour change communication (SBCC) to improve the consumption of nutritious foods.
3. Create an enabling environment for digital innovations including policies, institutional support, capacity-building and infrastructure development to ensure that smallholders in developing countries benefit from these innovations.
4. Develop strong, inclusive, transparent and evidence-based policy processes to help to prevent or manage issues which are essential to achieving better food systems. For this, clear and well-defined goals, based on a comprehensive assessment and analysis of nutritional gaps and weaknesses in the food system need to be identified as is enabling and collaborative institutional and policy environments, processes and incentives that promote appropriate forms of collaboration between the sectors related to nutrition.
5. Leverage social protection in the fight against food and nutrition insecurity by developing methodologies to target the most vulnerable populations based on clearly defined and transparent inclusion criteria, by promoting the inclusion of nutrition and health within social safety nets, by creating political frameworks focused on social protection and food and nutrition insecurity and by developing monitoring and evaluation tools that measure the effectiveness and efficiency of social protection programmes on food security and nutrition also looking at the short- and medium-term resilience of beneficiary households.

Axis 3: Analysing the role of food systems favourable to food and nutrition security in Central Sahel

Multi-sector policies and programmes that align supply and demand and focus on agricultural development, food and nutrition security, job creation and social protection can create accessible and affordable food systems that respond to endemic food and nutrition insecurity in Central Sahel.

1. Strengthen multi-sector programmes and policies that harmonise supply and demand and focus on the agricultural development of nutritious foods, food and nutrition security and purchasing power and social protection to create accessible and affordable food systems that respond to food and nutrition insecurity.
2. Increase incentives for the availability, access and consumption of safe, diverse and nutritious foods through climate-smart agricultural production and the trade and distribution of fruits and vegetables, pulses and protein-rich foods as these are largely underutilised as a source of food and income.
3. Include measures that protect and empower the poor and women through safety nets that allow people to access nutritious food during shocks, the lean season or when household income is low while ensuring land rights, equitable access to productive resources and market access.
4. Support smallholder farmers to diversify their sources of income outside of on-the-farm employment, including agribusiness, to increase household income, the availability of nutritious food and to reduce negative coping behaviours.
5. Refocus efforts to prevent malnutrition towards local food systems by improving the existing infrastructure for nutritious foods, increasing diversity in food production, improving awareness of infant and young child feeding practices and providing fortified blended foods and integrated assistance such as food assistance programmes especially in fragile areas, during lean periods and for internally displaced people who do not have access to activities that generate income.

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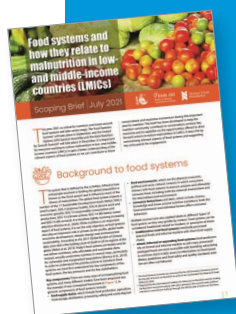
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Food systems and how they relate to malnutrition in low- and middle-income countries

This is a summary of the following report:
ENN (2021) Food systems and how they relate to malnutrition in low- and middle-income countries. Oxford, UK.
<https://www.ennonline.net/foodsystemsscopingbrief>

The year 2021 was a critical year for nutrition with issues around food systems taking centre stage following the UN Food Systems Summit in September. This summit, and the subsequent momentum generated, presented a unique opportunity to transform food systems so that they work to reduce malnutrition in low- and middle-income countries (LMICs). Nevertheless, it is not always immediately clear how food systems are related to malnutrition in all settings and actors working in malnutrition reduction do not always know how best to contribute to food systems conversations.

ENN developed this brief to help the nutrition community to contribute to conversations on food systems transformation and to capitalise on the opportunities offered to drive forward actions to reduce malnutrition in LMICs. The brief summarises the relevant aspects of food systems and suggests key entry points for engagement. The authors conducted a scoping review of the literature and key informant interviews and found that today's food systems are broken and are unable to deliver nutritious, safe, affordable and sustainable diets. Instead, such systems actually undermine nutrition in several ways, particularly for vulnerable and marginalised populations.

The key pressures on food systems that are leading to suboptimal function and ultimately to poor global diets include agricultural production becoming increasingly dependent on a small number of intensified monocultures which does not match global nutritional needs, climate change influencing the quality and quantity of food that can be produced and our ability to distribute it equitably, population growth, urbanisation and globalisation which are resulting in longer supply chains, more processing and the greater availability of ultra-processed foods and consumer behaviours being heavily influenced by the unregulated marketing campaigns of transnational companies.

The report highlights the effects of food systems on nutrition in fragile environments, the relevance of food systems for infant and young child feeding (IYCF), the relevance of food systems for the nutrition of school-

aged children and adolescents and the effect of food systems on the prevention and treatment of wasting and stunting. For example, in-kind food assistance, a life-saving solution in fragile contexts, has not been successful in rebuilding and strengthening food systems. It is increasingly recognised that multi-sector development actions need to be combined with humanitarian aid in fragile contexts, such as actions across agricultural production, market and trade systems, food processing and retail, as well as actions to improve consumer demand and purchasing power. Examples of food systems interventions influencing IYCF include the regulation of trade and the promotion of breastfeeding substitutes, policies around maternity leave for working mothers, investment in breast-milk bank infrastructures, interventions to increase public knowledge of optimal IYCF practices, the regulation of commercially available baby foods and nutrition-sensitive agriculture and livestock interventions for improving access to healthy complementary foods in farming communities. Adolescents and children are especially susceptible to the power of marketing by large food corporations due to the current lack of regulation. School food systems are an important entry point for influencing diets in school-aged children. Lastly, the report discusses the system surrounding the provision of ready-to-use therapeutic food for children with wasting which is a microcosm of wider food systems and needs a similar transformations such as shorter supply chains, cohesive but efficient product regulation and investment in national infrastructure.

The report concludes that, although there is a plethora of existing food systems knowledge and evidence within the areas of nutrition mentioned above, these topics are often not articulated together. The evidence-base regarding the impact of interventions within food systems on nutrition is vast but also complicated and somewhat disorganised which can make it difficult for policy-makers, donors and practitioners to navigate. There is a need to identify and translate relevant evidence of food systems interventions for improving undernutrition in LMICs since the links here are not always directly apparent and discussions can often be siloed.

A self-monitoring tool to improve nutrition counselling in Cambodia

This is a summary of the following papers:
Sigh S & Sacher A (2021) The use of a self-monitoring tool improves nutrition counselling delivered by community volunteers in Cambodia. Action Against Hunger Cambodia;
and Sigh S (2020) The use of a self-assessment tool in care groups to promote behaviour change, increase self-confidence and perceived control of women, and assess individual behaviour adoption over time. Action Against Hunger Cambodia.

To promote optimal child and maternal care and nutrition practices, the Multisectoral Food and Nutrition Security (MUSEFO) project implemented by Action Against Hunger implemented care groups in 180 villages across the Kampot and Kompong Thom provinces in Cambodia. The care group approach is a community-driven behaviour change model that combines cascaded, repeated messaging with comprehensive coverage to elicit nutrition- and health-related behaviour change. The groups are formed of female health volunteers who conduct regular group sessions and counselling with 10-15 caregivers of children under two years of age from their neighbourhood.

These papers evaluate the added value of using a self-monitoring tool – an illustrated card given to the caregiver to monitor practices at home – and participatory learning methods in addition to the existing delivery model, using mixed-methods: a desk review, telephone and in-person interviews, focus group discussions, and secondary data analysis.

In June 2020, 26 interviews and focus group discussions were conducted with 108 respondents and data from 30 self-monitoring cards. Both volunteers and caregivers perceived the card and participatory method as useful, noting that it acts as an aid that guides conversations during home visits, focusing the nutrition and health counselling on relevant priorities. Volunteers felt more confident when providing counselling which should result in increased job satisfaction. Feedback indicated that the tool enabled caregivers to participate actively in conversations. In addition, keeping the card at home made it easier for caregivers to recall key recommendations with one caregiver noting that “having this card is like having a teacher who keeps reminding me at home”.

Despite some challenges, e.g., illiteracy and incomplete or lost cards, the findings of this pilot study suggest that the combination of the self-monitoring tool and participatory methods is a promising approach to improving nutrition counselling quality and move beyond dissemination of nutrition information alone.

The State of Food Security and Nutrition in the World 2021

This is a summary of the following report:

The Food and Agricultural Organization (FAO), the International Fund for Agricultural Development (IFAD), the United Nations Children's Fund (UNICEF), the World Food Programme (WFP) and the World Health Organization (WHO). (2021). The State of Food Security and Nutrition in the World: Transforming food systems for food security, improved nutrition and affordable healthy diets for all. Rome: FAO.

<https://www.fao.org/3/cb4474en/online/cb4474en.html>



Even before the COVID-19 pandemic, the world was not on track to meet commitments to end world hunger and malnutrition in all its forms by 2030. This report presented the first global assessment of food insecurity and malnutrition for 2020.

The report found that the number of people affected by hunger increased in 2020 under the shadow of the COVID-19 pandemic. After remaining virtually unchanged from 2014 to 2019, the prevalence of undernourishment¹ increased to around 9.9% in 2020, from 8.4% a year earlier. An estimated 720 to 811 million people faced hunger in 2020. Approximately 660 million people may still face hunger in 2030; this represents 30 million more people than in a scenario where the COVID-19 pandemic had not occurred.

More than half of the world's undernourished are found in Asia (418 million) with an additional one third residing in Africa (282 million). While the global prevalence of moderate and severe food insecurity has slowly been rising since 2014, the estimated increase in 2020 was equal to that of the previous five years combined, with the gender gap even larger in 2020 compared to 2019. The high cost of healthy diets combined with income inequality caused healthy diets to be too expensive for around 3 billion people in 2019; this figure is expected to increase for 2020. Globally, malnutrition in all its forms also remains a challenge.

Although it is not yet possible to fully account for the impact of the COVID-19 pandemic due to data limitations, in 2020 it is estimated that 22% (149.2 million) of children under five years of age were affected by stunting, 6.7% (45.4 million) were suffering from wasting and 5.7% (38.9 million) were overweight. Furthermore, in 2019 an estimated 29.9% of women 15 to 49 years of age were affected by anaemia.

When food systems are transformed with greater resilience to the major drivers of food insecurity and malnutrition, such as conflict, climate variability and extremes and economic slowdowns, they can provide affordable, healthy and sustainable diets for all. Such a transformation can be a powerful driving force towards ending hunger, food insecurity and malnutrition in all its forms. This report recommended six pathways towards food systems transformation depending on the context:

1. Integrating humanitarian, development and peacebuilding policies in conflict-affected areas
2. Scaling up climate resilience across food systems
3. Strengthening the resilience of the most vulnerable to economic adversity
4. Intervening along the food supply chains to lower the cost of nutritious foods
5. Tackling poverty and structural inequalities, ensuring interventions are pro-poor and inclusive
6. Strengthening food environments and changing consumer behaviour to promote dietary patterns with positive impacts on human health and the environment.

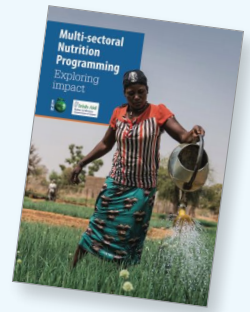
Bold actions such as those described in this report are required to accelerate progress towards ending world hunger and malnutrition in all its forms by 2030.

¹ The prevalence of undernourishment is an estimate of the proportion of the population whose habitual food consumption is insufficient to provide the dietary energy levels that are required to maintain a normal active and healthy life.

Multi-sectoral nutrition programming: exploring impact

This is a summary of the following report:
Ogada E, Bahwere P, Lelijveld N, Sessions N, Desplats G & Khara T (2021) Multi-sectoral nutrition programming – exploring impact. ENN, Oxford, UK.

<https://www.ennonline.net/mspexploringimpact>



Multi-sector nutrition programmes (MSNPs) have gained increasing prominence over the last two decades to address the many direct and underlying determinants of malnutrition. Both the recent *Lancet* Maternal and Child Undernutrition Progress series¹ and the *Lancet* Series on Adolescent Nutrition² stress the importance of effective multi-sector programmes to prevent and tackle malnutrition at every life stage. However, there are still large gaps in our knowledge on the efficacy, effectiveness and impact of multi-sector approaches compared to single sector interventions, due to limited information on appropriate methods for monitoring and evaluating MSNPs.

This report synthesises the available evidence on the impact of MSNPs and documents the type and quality of monitoring and evaluation systems established to measure impact. The authors conducted a systematic search to identify relevant evaluation reports, programme implementation reports, programme description documents, programme proposals, research reports, peer-reviewed publications, systematic reviews and meta-analyses, and country assessments and case studies.

The authors found that most evaluations were of the pre- and post-test design with no comparison group. Even the most rigorously designed evaluations noted the difficulty in attributing any or all impacts on the outcome indicators to the intervention alone. Secondary nutrition outcomes (such as household dietary diversity scores, food insecurity scores, indicators of infant and young child feeding (IYCF) and water, sanitation, and hygiene practices, standardised measures of women's empowerment, and indicators of household finances) were more widely measured and likely to show a positive improvement in household dietary diversity and IYCF indicators. Of the reviews that had a control group, the majority showed a positive impact on primary nutrition outcomes (child stunting, wasting, underweight, or anaemia). Few evaluations included coverage estimates. In addition, while all of the evaluations reviewed were of programmes engaging multiple sectors, interventions were often not delivered jointly or in a coordinated way, and most programmes had yet to go to national scale.

It is therefore recommended that careful attention is needed when implementing MSNPs so that they are implemented in a convergent manner. The scale-up of programmes needs improvement and this may be achieved by better embedding these in government structures. Indicators to assess programme coverage should be integrated into national information systems (within health, agriculture, and education) and a more objective way of comparing levels of programme convergence should be explored.

The authors also recommend that more guidance on effective and standardised MSNP evaluations is needed, as well as greater availability of funding for quality, large-scale evaluations. A minimum level of rigour should be set, ideally allowing for the assessment of change in outcomes between time points interpreted against the backdrop of secular trends. Ensuring the inclusion and importance of secondary nutrition outcomes rather than largely focusing on stunting impact is both important and more realistic for many programmes.

¹ <https://www.thelancet.com/series/maternal-child-undernutrition-progress>

² <https://www.thelancet.com/series/adolescent-nutrition>

Risk factors associated with wasting and severe wasting among under-5 children in India

This is a summary of the following report:
Center for Health Research and Development & UNICEF India Country Office (2021) Analysis of wasting and severe wasting and its associated risk factors among under-5 children in India.

Wasting remains a major cause of child mortality and morbidity globally. Current guidelines for the prevention, diagnosis and management, especially among children under six months of age, are mainly based on studies conducted in African settings. In India, specific data for this age group is lacking. This paper, featuring the collaborative efforts of the Knowledge Integration and Translational Platform at the Centre for Health Research and Development, the Biotechnology Industry Research Assistance Council and UNICEF India, contains an in-depth analysis to understand the burden of wasting, including severe wasting, in India and its associated factors. The analysis utilised data from the Comprehensive National Nutrition Survey (CNNS) which included children 0 to 59 months (nationally representative), Knowledge Integration (KI) datasets which covered children aged 0 to 23 months (from 15 national studies) and the intervention group of an ongoing cohort, the Women and Infants Integrated Growth Study (WINGS) which included children aged 0 to 11 months (from a trial in Delhi).

Overall, the authors found a high prevalence of wasting in the CNNS and KI datasets, and a lower prevalence in WINGS (CNNS 17.3%, KI 16.4%, WINGS 5.8%), a pattern mirrored in the severe wasting estimates (4.9%, 3.7%, 0.5%, respectively). Across all datasets, the burden of wasting and severe wasting was highest in the first six months of life compared to older age groups. Children born small for gestational age or with low birth weight each displayed a higher prevalence of both wasting and severe wasting than appropriate for gestational age or and normal birthweight children, respectively. The incidence of wasting (new episodes of wasting) was 0.32 (KI) and 0.55 (WINGS) cases per 365 days follow-up. The patterns for incidence of wasting and severe wasting were comparable to the prevalence data.

In line with other studies, the factors that were associated with wasting were lower maternal education, maternal underweight, Caesarean section, low birthweight and being a male child. Wasting in the first six months of life was found to be an independent risk factor for wasting at 12 and 24 months of age (WINGS and KI datasets). The authors concluded that programmes should focus on health and nutrition interventions at pregnancy and pre-pregnancy time points (e.g., early identification of mothers at risk of undernutrition), as well as close growth monitoring and wasting management over the infant's first 6 months of life, to counter the burden of wasting in early life and risks of wasting later in life.

An evidence gap map: food systems interventions for nutrition and food security outcomes

This is a summary of the following report:
 Moore N, Lane C, Storhaug I, Franich A, Rolker H, Furgeson J et al (2021)
3ie Evidence gap map brief: The effects of food systems interventions on food security and nutrition outcomes in low- and middle-income countries. International Initiative for Impact Evaluation.
<https://www.3ieimpact.org/evidencehub/publications/evidence-gap-maps/effects-food-systems-interventions-food-security-and>



In low- and middle-income countries (LMICs), constraints and complexities within food systems are significant drivers of malnutrition and food insecurity. However, the evidence base for the impact of interventions within food systems on improving nutrition and food security is complicated and disorganised. To address this challenge, the International Initiative for Impact Evaluations (3ie), with support from Innovative Methods and Metrics for Agriculture and Nutrition Actions, developed an evidence gap map (EGM). The map collates evidence from impact evaluations and systematic reviews, which assess the effects of food systems interventions on food security and nutrition outcomes in LMICs. The evidence is presented graphically on an interactive online platform, facilitating the identification of evidence and potential gaps in a user-friendly way. Supporting information for the map is published in the 3ie EGM report 16.

The map includes 2,035 published and unpublished studies that took place between 2000 and mid-2020: 178 systematic reviews, and 1,838 impact evaluations. Impact evaluations were primarily located in Sub-Saharan Africa (33%), South Asia (20%), and East Asia and the Pacific (17%). The evidence is mapped according to a framework of 49 interventions, 48 intermediate outcomes, and 26 final outcomes. There was an increase in the number of studies published since 2000, with the largest increase in interventions aiming to improve the food supply chain or consumer behaviour within food systems. Similarly, there has been an increase in the quality of studies available. The most common interventions focused on providing supplements, fortification, classes, peer support, and counselling, targeting consumer behaviour, and direct provision of food. However, several interventions, including some that have been widely implemented, have not been well researched, allowing for potentially negative consequences and the inefficient use of funds. For example, the authors did not identify any impact evaluations related to advertising regulations, food waste education programmes, or food packaging.

Despite women being important actors within food systems, the authors identified

relatively few studies examining interventions supporting women's decision-making or measuring outcomes related to women's empowerment. Most impact evaluations were also conducted at a local and subnational level, resulting in less evidence on national and transnational interventions; this gap is likely driven by a tendency to rely on randomised control trials. Few studies implemented mixed methods, reported cost-effectiveness evidence, or considered outcomes along the impact pathway.

Based on the gaps identified, the authors suggested several synthesis opportunities and outcomes and interventions that could be prioritised in future work.

Interventions to prioritise for impact evaluations:

- Government manipulations of price
- Advertising and labelling regulations
- On-farm post-harvest processing
- Interventions to support food packaging
- Efforts to support women's empowerment within food systems
- Innovative store design
- Cold chain storage

Outcomes to prioritise for impact evaluations:

- Women's empowerment
- Economic, social, and political stability
- Food loss
- Environmental impacts of food systems
- Measures of diet insufficiency

Synthesis opportunities:

- Agricultural extension and information-sharing activities within the food value chain
- Provision of free or reduced-cost farm inputs to crop production
- Educational approaches within the food value chain
- Agricultural insurance products
- Outcomes related to other diet quality and adequacy measures

The EGM, corresponding report and brief are available from: <https://www.3ieimpact.org/evidencehub/publications/evidence-gap-maps/effects-food-systems-interventions-food-security-and>

COVID-19 Learning Series

In 2021, ENN embarked on a COVID-19 Learning Series¹ that aimed to complement existing COVID-19 learning initiatives within the nutrition sector, including through the Global Nutrition Cluster Technical Alliance, capitalising on our rich network and fora. A key focus of the series was on capturing the field-level experiences of those operating within the context of the COVID-19 pandemic. ENN wanted the series to contribute to understanding the impacts of COVID-19 on undernutrition and nutrition issues in local communities as well as the challenges that COVID-19 presents for implementing nutrition services.

To ensure that ENN was complementing, rather than replicating, existing learning efforts, ENN initially embarked on a survey of needs that was intended to inform the selection of topics and contacts for case studies. This survey was designed to collect information from our network

on the topics that they felt were still underrepresented within the existing information pool regarding COVID-19 and nutrition programming/services in low- to middle- income countries.

These survey results are now published² and they were used to inform the subsequent work in the series. ENN then produced four case studies and a synthesis document focusing on the role of entrepreneurs in supporting nutrition and health services during the pandemic:

- **Case study 1: Western Stone Enterprise**, a woman-led business that produces peanut paste, sesame paste and other value-added agricultural products in Kenya.
- **Case study 2: A deck Juice Bar**, an all-natural smoothie bar run by a young entrepreneur in Dar es Salaam, Tanzania.
- **Case study 3: Sky Brands**, a food processing company specialising in biofortified products in Zimbabwe.

- **Case study 4: Solvoz**, an open-access digital procurement platform connecting humanitarian organisations and local suppliers.
- **Synthesis report**: a short summary of the key learnings from the four case studies relevant to nutrition practitioners.

Finally, ENN also produced a report on practitioners' experiences of the impact of the COVID-19 pandemic on the number and demographics of those people accessing nutrition services in low- and middle-income countries.³ This was a qualitative synthesis of perspectives shared with ENN over several online interviews representing organisations from across the world.

We trust that this Learning Series offers an interesting snapshot of stories and experiences on the topics requested by our network and hope that FEX readers will enjoy exploring these resources to guide their respective organisations on relevant topics.

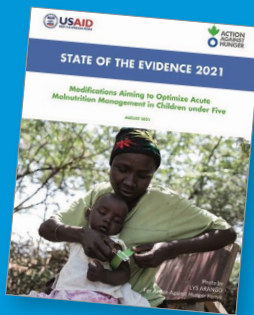
¹ <https://www.ennonline.net/c19learningseries>

² <https://www.ennonline.net/c19learningseries/scopingurvey>

³ https://www.ennonline.net/c19learningseries/practitioner_survey

State of the evidence: Simplified approaches

This is a summary of the following report: *Action Against Hunger USA. (2021). State of the Evidence 2021: Modifications Aiming to Optimize Acute Malnutrition Treatment in Children Under Five. New York.* <https://www.actionagainsthunger.org/publication/2021/08/state-evidence-2021-modifications-aiming-optimize-acute-malnutrition-management>



While community-based management of acute malnutrition (CMAM) has increased programme coverage and access to treatment, significant challenges remain in meeting the needs of all malnourished children worldwide. Simplified approaches are a range of modifications and innovations to standard CMAM protocols that aim to simplify and streamline operations, maximise coverage, reduce overall costs, and optimise cost-effectiveness. This report assesses the current state of evidence of six modifications based on a review of peer-reviewed publications and grey literature resources, including operational data and case studies.

1. **Family mid-upper-arm circumference (MUAC)** is one of the most widely implemented approaches. It aims to improve early detection and referral by empowering caregivers to detect acute malnutrition in their own children, at the household level, by measuring MUAC and assessing oedema themselves. However, robust evidence is lacking regarding programme effectiveness and cost-effectiveness on improving early treatment, identifying and referring clinical danger signs, handling moderate acute

malnutrition (MAM) cases if treatment is unavailable, and best practices to ensure an effective programme design.

2. **Reduced frequency of follow-up visits** aims to increase access to services and uptake by reducing the travel burden for caregivers, while prioritising resources for high-risk children who may return for more frequent visits. While this approach is widely implemented, evidence is limited. Available evidence indicates adequate MUAC and weight gain.
3. **Modified admissions and discharge criteria** includes a range of modifications to admissions and discharge protocols. The most common modification is using only MUAC and oedema for admissions and discharge criteria, which often includes an increase in MUAC thresholds for admissions to capture children otherwise admitted by weight-for-height z scores (WHZ). MUAC- and oedema-only programming is based on the suggestion that an increased MUAC threshold is more appropriate than combining MUAC and WHZ to identify children at the highest risk of death, given the associations between MUAC and mortality and the operational simplicity of

MUAC. There is a large body of evidence for MUAC- and oedema-only programming, with more limited evidence for expanded MUAC thresholds within this approach.

4. **Combined treatment/protocol for severe acute malnutrition (SAM) and MAM** incorporates treatment across the full spectrum of acute malnutrition via one unified programme in one location. This approach can (but does not always) use one nutritional product. The evidence base consists of several studies with varied research designs which, to date, indicate that combined protocols are non-inferior to standard protocols, are more cost-effective, and may enable earlier treatment.
5. **Modified or reduced dosage of therapeutic or supplementary foods** aims to optimise the dosage for recovery to improve cost-effectiveness, programme coverage, impact, and efficiency. The evidence base comprises a few studies with varying degrees of rigour. The existing evidence largely finds that overall programme recovery rates using modified dosages were non-inferior to those using weight-based dosages. However, some secondary outcomes and sub-analyses found differences across groups.
6. **Acute malnutrition treatment by community health workers (CHW)** shifts most or all treatment components for children with acute malnutrition (without medical complications) to a community setting to improve programme coverage and early access to treatment, lower default rates, and to reduce treatment-seeking costs for caregivers. There is a robust evidence base supporting CHW-led SAM treatment. However, questions remain regarding the effectiveness of CHW-led MAM treatment, cost-effectiveness, long-term quality of care, and optimal training and incentives.

Nutrition and climate change: A scoping review of current state of play

This is a summary of the following report:
Bush A, Wrottesley S, Mates E & Fenn B (2022) Nutrition and Climate Change - Current State of Play: Scoping Review.
www.ennonline.net/nutritionandclimatechange



Climate change is one of the biggest challenges facing both current and future generations. In a world where undernutrition is declining very slowly and overnutrition is increasing rapidly, climate change will have severe and multifaceted effects on nutritional status and therefore on survival, health and development. Climate change and nutrition have overlapping agendas and enhanced collaboration could generate a common agenda for both communities.

This report presented the findings from a scoping review conducted by Emergency Nutrition Network (ENN) between January and November 2021. The review explored existing linkages between nutrition and climate change as well as examining if, and how, linkages could be strengthened and where related efforts to address climate change would be best placed. A series of 21 key informant interviews (KIIs) with stake-

holders working in climate change and/or nutrition were conducted to gain an understanding of the available evidence, current activities, gaps and opportunities. Based on the focal areas identified during stakeholder engagement, the available literature was reviewed. The literature review was therefore thorough but not systematic and the evidence presented was not exhaustive. While it was recognised that climate change and nutrition were broad topics with links to many sectors, the themes, actions and gaps presented in the report were centred around health because the work of many key informants (KIs) focused on this sector and health was the main delivery platform for many nutrition interventions. Similarly, the findings concentrated on the impacts of climate change on nutrition outcomes, rather than those of nutrition on climate change, as these aligned best with the perspectives and experiences of both the KIs and ENN.

Women's nutrition

This is a summary of the following report:
Philip T. James, Stephanie V. Wrottesley, Natasha Lelijveld, Eilise Brennan, Bridget Fenn, Rachael Menezes and Emily Mates. (2022).
Women's Nutrition: A summary of evidence, policy and practice including adolescent and maternal life stages.
www.ennonline.net/womensnutritionsummarytechnicalbriefingpaper



Malnutrition disproportionately affects women and girls, with more than 1 billion women globally experiencing at least one form of malnutrition. This report brings together global targets and guidelines for women's nutrition, summarises the nutritional vulnerabilities of adolescent girls and women, provides a review of the evidence surrounding current nutrition interventions, highlights the remaining gaps and finishes with recommended actions needed to improve nutritional status for women and girls.

The authors summarised the global targets aimed at reducing maternal mortality, reducing the prevalence of anaemia in women 15 to 49 years of age and addressing the nutritional needs of pregnant and lactating women and girls. The authors then identified several guidelines that include the nutrition of adolescent girls and women. However, numerous gaps exist with guidelines for humanitarian contexts being particularly patchy. While the coverage of nutrition interventions for adolescent girls and women was largely not well documented, several interventions do exist. These include direct nutrition interventions such

as macronutrient and micronutrient supplementation and food fortification and indirect interventions such as nutrition education and counselling, social protection programmes, sexual and reproductive health services, the treatment and management of communicable and non-communicable diseases, mental health services, breastfeeding support, nutrition-sensitive agriculture and women's empowerment interventions.

In reviewing the evidence, interventions and guidelines, the authors identified several key gaps including:

1. Navigating and finding the latest guidelines on nutrition for adolescent girls and women is challenging.
2. There is a lack of evidence and guidance on pre-conception nutrition especially for adolescents.
3. Global and national indicators are heavily focused on infant and child outcomes rather than outcomes for the mother herself.
4. There is a lack of guidance and clarity on the assessment of nutritional status in adolescent girls and women including: (1) no optimal, context-specific mid-upper-arm circumference

Findings

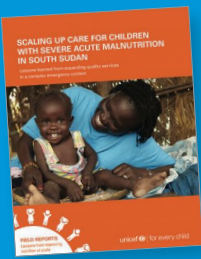
The report provided an overview of the international architecture around climate change and how this related to nutrition. It presented the evidence base for the effects of climate change on nutrition outcomes, outlined current actions linking nutrition and climate change and identified multiple opportunities for strengthening linkages between nutrition and climate change according to KIIs.

In summary, nutrition and climate change are inextricably linked through complex, multidirectional pathways. Populations vulnerable to the negative effects of climate change are also those most vulnerable to undernutrition – women, children and poorer, rural households, particularly those living in fragile and conflict-affected states. While interest in, and awareness of, the climate crisis is growing, efforts to combat it are not yet resulting in the required political action to limit global warming to agreed levels. Although many gaps remain, evidence for the negative effects of climate change on undernutrition is growing. It is predicted that the biggest threat to health from climate change is via undernutrition. Actions to strengthen linkages are currently limited but do appear to be increasing. Health and gender can provide useful entry points for integrating nutrition into global climate change conceptual frameworks and national level commitments. Future efforts need to focus on more holistic systems approaches to address the huge threat that climate change poses to achieving universal healthy sustainable diets and well-nourished populations.

cut-off for wasting; (2) no routine collection of dietary adequacy indicators; and (3) a lack of global data on gestational weight gain.

5. There are contrasting interpretations of the evidence base for whether iron-folic acid or multiple micronutrient supplementation should be used in pregnancy. There is also a lack of understanding of the best ways to improve adherence to supplementation.
6. There are gaps in the guidelines for macronutrient supplementation in undernourished women: 1) there is no World Health Organization guideline on identifying and treating adult moderate and severe wasting; 2) the relatively new guidance on balanced energy protein supplementation lacks detail and implementation guidance; 3) there is lack of guidance on mitigating the risks related to the double burden of malnutrition and non-communicable diseases.
7. There is a lack of indirect nutrition interventions for adolescent girls and women including: (1) a lack of gender empowerment in nutrition programmes; (2) a lack of research, screening tool(s) and intervention packages linking maternal mental health and nutrition; and (3) a lack of interventions focusing on the impact of climate change on nutrition.
8. There is a lack of integration of nutrition services within health systems.

The report was launched at a webinar with a panel of experts sharing their reflections. The webinar is available at: <https://www.ennonline.net/mediahub/video/webinaronwomensnutritionjan2022>



Scaling up care for children with severe acute malnutrition in South Sudan

This is a summary of the following report:

United Nations Children Fund (UNICEF). (2020). *Scaling up care for children with severe acute malnutrition in South Sudan: Lessons learned from expanding quality services in a complex emergency context*. New York: UNICEF.

<https://www.unicef.org/southsudan/documents/scaling-care-children-severe-acute-malnutrition-south-sudan>

South Sudan faces a complex and protracted crisis and even before the conflict, the prevalence of global acute malnutrition in 2010 was 23% (Ministry of Health, National Bureau of Statistics, 2010). In 2013, the Government of South Sudan, UNICEF, and partners intervened to scale up services for children with severe acute malnutrition (SAM), and in 2014, UNICEF and the World Food Programme (WFP) launched a joint Nutrition Scale-Up Plan. The plan concentrated on a community-based prevention approach, promoted the continuum of care at nutrition sites, directly delivered nutrition interventions in hard-to-reach areas, developed the capacity of partners and governments, strengthened supply chains and pipeline management, enhanced needs analyses and coordination, and strengthened monitoring and evaluation. Several joint strategies were also piloted to improve programme efficiency and accelerate results, such as adopting a one common partner per location approach for UNICEF and WFP treatment programmes.

The scale-up of the community-based management of acute malnutrition (CMAM) programme was implemented as part of a broader strategy to improve maternal and child nutrition, which increased access to preventative services and improved infant and young child feeding practices. The proportion of children admitted to the CMAM programme compared with those in need increased from 40% in 2014 to 77% in 2018. The number of outpatient therapeutic programme sites more than doubled, from 351 sites in 2014 to 1,145 sites in 2019. Between 2014 and 2019, the proportion of children with SAM who recovered increased (78% to 91%), the proportion of children defaulting declined (17.4% to 5.3%), and the death rate remained low.

The report identified several challenges to effective scale-up: low health system capacity, the lack of long-term funding, poor infrastructure, occasional looting of nutrition supplies and supply pipeline disruptions, high staff turnover, and cancellations and postponements of integrated Rapid Response Missions.¹ The report also identified several enablers and lessons learned, including the need to:

- Mobilise political support and engagement from the highest levels of government for programme ownership, policymaking, and accountability.
- Leverage global evidence to encourage government endorsement of national guidelines using clear and easy-to-follow materials.
- Provide technical support, leadership, and coordination to jointly plan, implement, monitor, and report on CMAM strategies and activities within a government-United Nations-non-governmental organisation partnership.
- Mobilise communities for active programme engagement and create awareness and demand for CMAM services through community nutrition volunteers and mother-to-mother support groups.
- Develop the capacities of skilled health workers using harmonised training packages to support programme delivery with expanded coverage and quality, and test innovations to address bottlenecks and improve programme efficiency.
- Facilitate a smooth supply pipeline for therapeutic foods with a tracking system and pre-position supplies to avoid stockouts.
- Enable evidence-based, data-driven decisions by integrating child nutrition indicators across sectors and programmes, setting targets, and monitoring progress.

South Sudan's experience shows that it is possible to scale up a resilient, collaborative CMAM programme during an ongoing humanitarian crisis. However, predictable long-term funding and a stronger health system are needed to sustain the programme into the future.

¹ Rapid Response Missions deliver services directly to vulnerable women and children in hard-to-reach communities.

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Ministry of Health, National Bureau of Statistics (2010) South Sudan Household Health Survey, 2010. <https://reliefweb.int/report/sudan/sudan-household-and-health-survey-second-round-2010-summary-report>

Global Nutrition Cluster Annual Report

This is a summary of the following report:
The Global Nutrition Cluster and the Technical Alliance (2021). Annual Report.

https://www.nutritioncluster.net/resources_Annual_Report_2021



The Global Nutrition Cluster (GNC) 2021 Annual Report presents an in-depth view of the achievements of the GNC and the Technical Alliance (the Alliance) in 2021 to improve cluster/sector coordination and nutrition in emergencies programming. The report comes in two parts: 1) a global level summary of the work of the GNC and the Alliance, and 2) a country level report with 34 country profiles of the humanitarian response efforts of national clusters/sector coordination mechanisms.

In 2021, the GNC consolidated the significant expansion in its direct support to over 60 priority countries through close collaboration with key partners at the regional and country-level, increasing the scope and breadth of technical assistance through the Alliance and significant improvements in capacity building and knowledge management. Across the 34 countries providing data, 73.3 million people were identified as needing life-saving nutrition assistance in 2021, with emergency nutrition response services reaching 39.7 million women and children in need.

In 2021, 57 out of the 62 priority countries received direct support from the GNC. The Technical Support Team provided operational and technical support to national-level nutrition coordination mechanisms and partners for improved cluster coordination and nutrition in emergencies programming via remote and in-country deployments and helpdesks.

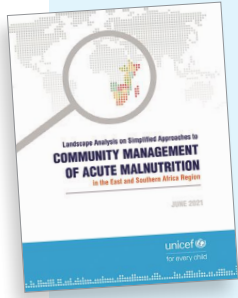
In response to the COVID-19 pandemic, the GNC continued to adapt to more flexible and innovative ways of working. The GNC's shift to providing remote support was evident in its capacity development strategy with 24 webinar events and 33 remote training packages implemented in 2021. To facilitate the increased scope of its work, the GNC continued to expand its blended learning programme to build capacity for nutrition coordination, information management and nutrition in emergencies programming. This programme comprises the GNC mentoring programme,¹ which recruited a further 33 mentees in 2021, and the soft launch of GNC Learn,² an online learning platform with more than 120 courses.

One of the most significant challenges in 2021 was limited financial resource allocation for cluster and sectoral coordination capacity at the country level. The Advocacy and Finance working groups were established to help to overcome this challenge and provide a more strategic approach towards advocacy. In addition to funding constraints, countries reported several challenges such as deteriorating social-economic situations, disruptions to nutrition services and data collection efforts due to the COVID-19 pandemic, lack of information management capacity contributing to the low availability of recent data, persistent conflict affecting the movement of people and supplies and challenges in implementing intersectoral approaches.

A pivotal event for the GNC in 2021 was the launch of the GNC Strategy (2022-2025) and the related workplan which set out the priorities over the next four years for both the GNC and the Alliance. For the GNC, key focus areas moving forward include launching the GNC e-learning platform and finalising the GNC Advocacy Strategy (2022-2025). The next steps for the Alliance are to continue providing demand-driven technical services for requests while improving systems and the quality of support provided. This includes the need to generate demand for the Alliance's services, particularly with focused outreach at national and sub-national levels.

¹ https://www.nutritioncluster.net/resource_GNC_Mentoring_Programme

² <https://www.nutritioncluster.net/learn>



Landscape analysis of simplified approaches to community-based management of acute malnutrition in the East and Southern Africa Region

This is a summary of the following report:

https://www.simplifiedapproaches.org/_files/ugd/2bbe40_280957e3883a4b9a8bd2be47bb047998.pdf

By **Michele Goergen**, **Teweldeberhan Daniel** and **Christiane Rudert**

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Background

Many countries in the Eastern and Southern Africa Region (ESAR) are implementing simplified approaches to the community-based management of acute malnutrition. However, there is limited information on the scale of implementation in the region. A landscape analysis was conducted to identify which approaches are being implemented and what actions are required to accelerate scale-up for the early identification and treatment of child wasting across ESAR.

Methods

The landscape analysis was conducted in 13 countries in ESAR. Countries were selected if they were Global Action Plan (GAP) frontrunner countries¹ or if they had implemented simplified approaches. The selected countries were Angola, Comoros, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mozambique, Somalia, South Africa, South Sudan, Uganda and Zimbabwe.

The analysis included:

- Review of key documents: nutrition policies and guidance notes, strategies, annual planning documents, tools, reports, evaluations and research articles

- Mapping: a mapping tool was completed by country offices
- Key informant interviews (KIIs): interviews were conducted with a total of 46 KIIs, including 33 Ministry of Health workers, UNICEF staff and non-governmental organisation (NGO) partners from the selected countries and 13 individuals working at regional level from a total of 11 United Nations agencies and NGOs.

Results

A total of 48 projects were identified to be implementing simplified approaches in the region. Prior to the COVID-19 pandemic, simplified approaches were predominantly implemented as emergency adaptations to mitigate operational challenges or as research/pilot projects to gather evidence. The onset of the COVID-19 pandemic resulted in a 46% increase in the use of simplifications in ESAR, either as new initiatives to respond to the pandemic or as activation/scale-up of previously implemented simplifications.

All KIIs interviewed during the landscape analysis expressed a strong interest in simplified approaches and were eager for more guidance on their use and for the results from imple-

mentation research. Family mid-upper arm circumference (MUAC) was the most commonly implemented and well-received approach in ESAR although gaps remained in data collection and reporting for this approach. Many countries described challenges related to collecting screening data and continually capacitating family members to take MUAC measurements. Modified dosages and the use of a single treatment product have generated a lot of interest in the region but anxieties around pipeline management create a barrier to implementing these approaches outside of pilot projects or emergency contexts. Treatment of wasting by community health workers has been piloted in many countries. However, these countries expressed needs for more operational research to inform best practice in implementation within the health system and existing community structures and to determine the long-term cost effectiveness and optimal modalities for training and supply management.

Discussion

Although simplified approaches have been associated with positive treatment outcomes in pilot studies, many country offices expressed challenges to implementing those approaches within health systems. Operationalising these approaches requires changes to reporting mechanisms, supply chains, training and capacity building. Results from the landscape analysis highlight the following priorities for ESAR:

1. Identifying simplifications that are ready for scale up within health systems
2. Addressing gaps, including:
 - Establishing reporting systems for simplifications, utilising existing health system mechanisms where possible
 - Supporting pipeline management through caseload calculations, especially for moderate acute malnutrition.
 - Supporting training and capacity development for simplified approaches
3. Conducting implementation research on simplified approaches

¹ Madagascar, Malawi, Burundi, Ethiopia, Kenya and South Sudan

Figure 1 The number of countries implementing each simplified approach

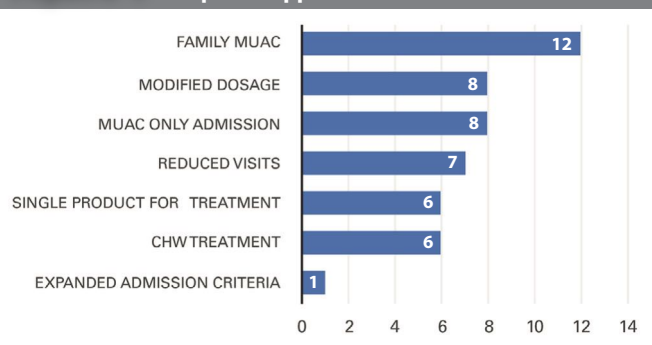
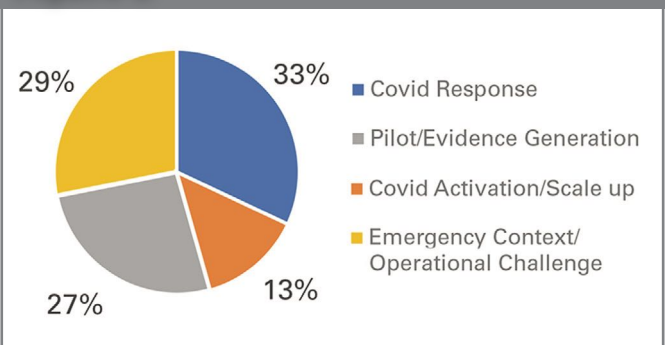


Figure 2 Reasons for implementing simplifications





Farmers being trained on how to apply conservation agriculture techniques in Mozambique

Decentralising treatment in Mozambique: Findings from a pilot intervention on wasting

This is a summary of the following report:

UNICEF (2019) Monitoring and evaluation of the community management of acute malnutrition pilot intervention in Mozambique.

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Nutrition Situation in Mozambique

In Mozambique, approximately 6% of children under five years of age are affected by wasting (DHS, 2011). Wasting treatment services are available through the national health system, managed by the Nutrition Department under the Nutrition Rehabilitation Program (PRN), and have shown a high cure rate. However, outpatient wasting treatment has historically shown high defaulting rates (23% in 2015), especially in hard-to-reach or remote areas. Given these challenges, the Ministry of Health introduced a pilot intervention decentralising the treatment of child wasting from health facilities to community health workers (CHWs) in 2017. This pilot intervention started in three communities and subsequently expanded in 2019 to 26 more communities in 12 districts of three provinces in Mozambique: Nampula, Tete and Zambezia. The pilot areas were selected based on the following criteria: high prevalence of acute malnutrition/ wasting, the presence of a qualified CHW, a remote/hard to access health facility, and high defaulter rates from treatment.

Evaluation

An evaluation of the intervention was conducted to provide independent, critical findings on the quality, effectiveness, and efficiency of the pilot. To answer the evaluation questions, the review analysed processes and results for seven components (pilot planning and operationalisation, capacity-building, community engagement, performance and quality of services, logistics, monitoring and evaluation system, and the intervention scale-up). Data collection utilised qualitative and quantitative data, collected between February and October 2019.

The evaluation demonstrated that the trained CHWs were able to effectively treat uncomplicated cases of wasting, reaching a cure rate of 92% and a default rate of 4%, which positively impacted Mozambique's traditional PRN model. Nevertheless, the evaluation of the capacity-building component showed that the interpretation of complex guidelines was a challenge for the CHWs, specifically the interpretation of weight-for-height z-scores. Whilst strong accountability mechanisms were put in place for

stock management and periods of stock outs, difficulties in transportation and a lack of anthropometric material merit an increased focus on logistics and supply chains moving forward.

Despite the challenges, this intervention was found to deliver a positive impact on the autonomy and commitment of communities in resolving the problem of wasting locally, with a documented evolution in the quality of the service over time. As such, this approach to decentralised treatment should be considered for scale-up, particularly in high burden and remote areas. However, the scale-up will require a significant effort and commitment from local government, the United Nations, non-governmental organisations (NGOs) and other donors, to ensure medium- and long-term sustainability.

For more information, please contact Grace Funnell at gfunnell@unicef.org

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DHS (2011) Moçambique inquérito demográfico e de saúde 2011. Instituto Nacional de Estatística.

community interviews with mothers, caregivers and health workers.

Results

- **Relevance:** Programme relevance was demonstrated by the fact that the outcomes over-lapped with those in MoPHP sectoral policies and plans and national CMAM guidelines. However, national guidelines were inconsistent with global CMAM standards. While the programme had many relevant targets, some underlying causes of malnutrition, such as wide spread poverty and inadequate family planning, were not addressed.
- **Efficiency:** The programme was underfunded in 2020 and faced human resource shortages and supply chain disruptions. While coordination and knowledge transfer mechanisms were available at national and sub-national levels through the Nutrition Cluster and CMAM Technical Working Group, operational inefficiencies occurred due to limited engagement by key stakeholders (e.g., government representatives), an ad hoc approach to cluster meetings and a narrow focus in discussions.

Evaluation of community-based management of acute malnutrition in Yemen

This is a summary of the following report:

UNICEF (2022) Evaluation of community-based management of acute malnutrition in Yemen.

Background

In Yemen, nearly 3 million children under five years of age suffered from acute malnutrition in 2021, of whom 500,000 suffered from severe acute malnutrition (SAM). The community-based management of acute malnutrition (CMAM) approach was introduced in Yemen in 2008, implemented exclusively through health facilities. Implementation modalities have since been diversified by the Government of Yemen (GoY) and partners, putting 3,923 outpatient therapeutic programmes (OTPs) and 24,000 community health volunteers (CHVs) in place by 2019. The CMAM programme is implemented in 22 governorates of Yemen across four components: (1) community outreach; (2) the management of SAM without complications through OTPs; (3) the management

of SAM with complications through therapeutic feeding centres (TFCs); and (4) the management of moderate acute malnutrition (MAM) through therapeutic supplementary feeding programmes (TSFPs). This report presents the findings from a formative evaluation of the CMAM programme.

Methods

The independent evaluation was conducted between May 2021 and January 2022 using quantitative and qualitative data, predominantly from secondary sources. This was supplemented with primary data from 19 key informant interviews with stakeholders from organisations including UNICEF, the World Health Organization, the World Food Programme, Yemen's Ministry of Population & Public Health (MoPHP) and 24



Child being screened for malnutrition in Yemen

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- **Effectiveness:** The scale-up of the CMAM programme contributed to high cure rates (2019: 85% for OTPs, 91% for TFCs, 86% TSFPs; 2020: 87% for OTPs, 93% for TFCs,

90% for TSFPs) and low defaulter rates (2019: 12% for OTPs, 6% for TFCs, 12% TSFPs; 2020: 10% for OTPs, 5% for TFCs, 4% for TSFPs). A total of 35,000 health workers were trained in 2019, enabling the expansion of services. However, programme achievements were inconsistent at sub-national level, affected by the number of available facilities, the quality of human resources, the availability of supplies, coordination mechanisms and community engagement. Programme monitoring had also been limited by a lack of uniformity in indicators, recording and reporting tools and inadequate staff availability and capacities.

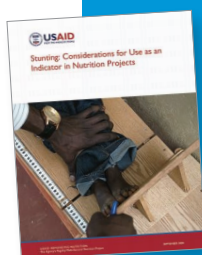
- **Sustainability:** Currently, the GoY is not in a position to sustain CMAM activities, remaining dependent on development partners due to inadequacies in public funds and limited technical and operational capacities.
- **Gender equality:** Gender equality principles had been partially integrated through targeting both boys and girls and pregnant and lactating women and mothers, recruiting female CHVs and gender-disaggregating the collection and reporting of data. However, gender

gaps in staffing remain, particularly within OTP services and senior government roles.

- **Equity:** The programme was partially consistent with equity principles, prioritising underserved/remote populations through community outreach, incentivising service users and delivering indiscriminate services. However, the programme design was not informed by a systematic equity assessment and there was no explicit focus on people/families with disabilities.

Conclusion

This evaluation highlighted the continued need for the CMAM programme in Yemen. However, areas requiring attention include updating national CMAM guidelines to reflect global guidelines, advocating for greater political and financial commitment from the GoY and ensuring that essential documents are completed and robust and reliable monitoring data is available. Specific recommendations to guide the continuation and improvement of the programme are outlined in the report.



Considering the use of 'stunting' as an indicator in nutrition projects

This is a summary of the following report: *USAID Advancing Nutrition (2020) Stunting: Considerations for use as an indicator in nutrition projects*. Arlington, VA: USAID Advancing Nutrition. <https://www.advancingnutrition.org/resources/stunting-considerations-use-indicator-nutrition-projects>

Background

Over the past decade, many national and donor-funded programmes have prioritised a reduction in stunting (low height-for-age) as their primary objective. However, improvements in linear growth are difficult to achieve over the short term in many contexts and often require long-term multi-sector investment to address various social, political and economic determinants. This has led to the apparent 'failure' of programmes despite their numerous other benefits for nutrition and human development. Based on literature from low- and middle-income countries published since 2013, this report discusses the use of stunting as an indicator and proposes the identification of a broader set of indicators to monitor and evaluate the United States Agency for International Development (USAID) (and other) nutrition programmes.

Interpreting stunting as an indicator

Stunting is an attractive indicator of programme performance since the data is relatively easy to collect and interpret. However, evidence suggests that stunting has been misused as an indicator of programme success for the following reasons:

- **Stunting is not equivalent to undernutrition.** Stunting is often erroneously equated with chronic undernutrition, resulting in a focus on addressing stunting through improved dietary practices. In reality, stunting is a marker of a deficient environment in which a number of potential factors, including diet, caregiving, frequency and severity of illness and the use of health services, limit child growth and development. Thus, multiple and multi-sector interventions that address all causes, such as environmental and social determinants, are needed to improve the long-term outcomes for children.
- **Stunting is a statistical measure, not a clinical condition.** The cut-off used to define stunting (-2 standard deviations from the median of a reference population) is often interpreted as a threshold for healthy growth when, in fact, the risks associated with stunting increase across a continuum. Thus, depending on the context, many children who are not classified as stunted may not be achieving their full growth potential while some children who are classified as stunted may not be in poor health.
- **Not all nutrition interventions should be expected to reduce the prevalence of stunting.**

Decades of research show that some nutrition interventions have little effect on linear growth. At the same time, non-health-sector interventions such as poverty alleviation and education have substantially contributed to declines in stunting prevalence, especially for girls. Thus, nutrition interventions and single interventions are unlikely to reduce stunting. Further, reductions in stunting require time to show impact and this restricts its relevance as an indicator of short-term (e.g., five-year) programmatic success.

- **Stunting does not capture the many important benefits of nutrition programmes.** Assessing only stunting fails to reflect the many other positive effects of improved nutrition for biological, cognitive and behavioural outcomes.

Use of stunting within USAID programmes

Despite its limitations as an indicator of programme performance, stunting prevalence remains a useful population measure that reflects overall living conditions and welfare. It is also useful to compare progress within the same population over time and to identify sub-groups of vulnerable children within a population who may benefit from nutrition programmes.

Selecting indicators for USAID activities

Overall, this report highlighted that, rather than relying on stunting to measure success, nutrition programmes should measure a broader set of lower-level indicators that can be more directly attributed to programme activities. Indicator selection should be informed by a logic model that reflects the full pathway between interventions and results, incorporating a range of nutrition, health and development outcomes.

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Front cover

Illustration by Jon Berkeley

Back cover

Mothers wait for their children in a clinic, Indonesia
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About ENN

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

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

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

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